**Part 4**: "New Advanced Study of Magic Squares and Cubes"
**Chapter 4**: Commentary Articles No.2 by **Kanji Setsuda**:
"Various Arts and Tools for Studying Magic Squares"

# Section 8: How to build 'Complete Euler Squares' 8x8 by Binary Number System

## 0. Let's build 'Complete Euler Squares' 8x8, shall we?

Why don't we build various Pan-diagonal Magic Squares of order 8 by "Greco-Latinian Method" applied even to every pan-diagonal of the object? Now that we can not make any 'Complete Euler Square' of order 8 by Positional Number System of Base 8, instead of giving it up, let's build them by Base 2, that means 'Binary Number System.'

## 1. Definition of 'Complete Euler Squares' 8x8 by Binary Number System

What do they look like by Binary Number System?

Let me take the next list for instance. It shows a few example solutions of the 'Composite and Complete' magic square of order 8: The figure on the left most is the solution presented in classical notation. The next six figures on the right side stand for the Decomposed Layers of the solution by binary number system.

```
1/Composite                /D2i
  1 63  3 61  8 58  6 60   01010101 01010101 01010101 01011010 01101001 00001111
 56 10 54 12 49 15 51 13   10101010 10101010 01010101 10100101 10010110 11110000
 17 47 19 45 24 42 22 44   01010101 10101010 01010101 01011010 01101001 00001111
 40 26 38 28 33 31 35 29   10101010 01010101 01010101 10100101 10010110 11110000
 57  7 59  5 64  2 62  4   10101010 10101010 10101010 01011010 01101001 00001111
 16 50 14 52  9 55 11 53   01010101 01010101 10101010 10100101 10010110 11110000
 41 23 43 21 48 18 46 20   10101010 01010101 10101010 01011010 01101001 00001111
 32 34 30 36 25 39 27 37   01010101 10101010 10101010 10100101 10010110 11110000
                                32*      16*       8*       4*       2*       1*
2305/C                     *D2i
  1 63  3 61 12 54 10 56   01010101 01010101 01011010 01010101 01101001 00001111
 60  6 58  8 49 15 51 13   10101010 10101010 10100101 01010101 10010110 11110000
 17 47 19 45 28 38 26 40   01010101 10101010 01011010 01010101 01101001 00001111
 44 22 42 24 33 31 35 29   10101010 01010101 10100101 01010101 10010110 11110000
 53 11 55  9 64  2 62  4   10101010 10101010 01011010 10101010 01101001 00001111
 16 50 14 52  5 59  7 57   01010101 01010101 10100101 10101010 10010110 11110000
 37 27 39 25 48 18 46 20   10101010 01010101 01011010 10101010 01101001 00001111
 32 34 30 36 21 43 23 41   01010101 10101010 10100101 10101010 10010110 11110000
                                32*      16*       8*       4*       2*       1*
```

```
 1= 0*32 + 0*16 + 0*8 + 0*4 + 0*2 + 0*1 + 1;
63= 1*32 + 1*16 + 1*8 + 1*4 + 1*2 + 0*1 + 1;
 3= 0*32 + 0*16 + 0*8 + 0*4 + 1*2 + 0*1 + 1;
61= 1*32 + 1*16 + 1*8 + 1*4 + 0*2 + 0*1 + 1;
60= 1*32 + 1*16 + 1*8 + 0*4 + 1*2 + 1*1 + 1;
17= 0*32 + 1*16 + 0*8 + 0*4 + 0*2 + 0*1 + 1;
44= 1*32 + 0*16 + 1*8 + 0*4 + 1*2 + 1*1 + 1;
 . . . . . . .
41= 1*32 + 0*16 + 1*8 + 0*4 + 0*2 + 0*1 + 1;
Vn= An*32 + Bn*16 + Cn*8 + Dn*4 + En*2 + Fn*1 + 1;
    (n=1, 2, 3, 4, ... , 63, 64: in classical notation)
```

The equations above are taken to be true among these 7 figures for each solution.
We often use this relation when we compose an object solution by 6 layers of binary

decompositions.

**Definition (1)**: In each layer every row, column and pan-diagonal must be made of {0,0,0,0,1,1,1,1}, {0,0,0,1,0,1,1,1}, {0,0,0,1,1,0,1,1}, {0,0,0,1,1,1,0,1}, {0,0,0,1,1,1,1,0}, {0,0,1,0,0,1,1,1}, {0,0,1,0,1,0,1,1}, ... , {1,1,1,1,0,0,0,0} using '0' four times and also '1' as often.

Therefore each sum of those rows, columns and pan-diagonals is calculated in the same form as:

{0+0+0+0+1+1+1+1}*32 +{0+0+0+0+1+1+1+1}*16 +{0+0+0+0+1+1+1+1}*8 +{0+0+0+0+1+1+1+1}*4 +{0+0+0+0+1+1+1+1}*2 +{0+0+0+0+1+1+1+1}*1 = {0+0+0+0+1+1+1+1} *(32+16+8+4+2+1) = 4*63 = 252(Decimal)

This makes every sum take the same value. It means 'magic constant' is realized.

252(Decimal) here is calculated and written for the 'mathematical' notation, which is made of the series of integers 0~63. It is equivalent to 260(Decimal) of classical notation, which is made of the series of natural numbers: 1~64.

**Def (2)**: Each layer must consist of 32 digits of '0' and as many '1' as '0'. This property is always true whenever the first condition (1) is true.

**Def (3)**: Every combination of 6 values of the corresponding layer positions must be any one of {00000000, 00000001, 00000010, 00000011, 00000101, ...., 00001101, 00001110, 00001111, ..., 11111110, 11111111(N2i)}, and neither repetition nor drop-off of any value must be taken.

This condition is logically equivalent to one of the most basic promises for our classical notation that we must use the series of natural numbers 1~64 to make the object and use each number strictly once and must not use anyone twice or more often in the same solution.

They say Legendary Leonhard Euler(1707-1783) did not mention even about the pan-diagonals of 'Greco-Latin Squares' (Dr. Mutsumi Suzuki once taught me about this), but we want all pan-diagonals to accept the Definition (1) of 'C.E.S.' above and I want to call the "Complete Euler Squares" of order 8 for those which take them all as true.

## 2. Our Purpose

What we want to do now is to make various types of pan-diagonal magic squares of order 8 only by these definitions above and directly by the binary decompositions.

We need 6 layers of binary decompositions for each.

We need the complete set of all appropriate layer units to pick up and make each set of these 6 layers for each solution shown as above.

We need to know how to compose, pick up and combine those layer units.

(1) First of all, let's build the complete set of necessary layer units by ourselves.

(2) Let's choose 6 units to combine and make them act as the set of 6 layers of binary decompositions for each solution.

(3) We must know about the way how to combine them appropriately to make only correct solutions.

## 3. How to Make the set of Binary Layer Units for our Object

I once tried to make the 'universal' units for every type of order 8 in vain. But I finally noticed that we have to design and make each set of binary layer units individually according to the definition of each type of objects of order 8.

In the case of order 4, there is only one type of solution set for all kinds of pan-diagonal magic squares, and there is really only one set of layer units to be made for 'Complete Euler Squares' 4x4.

But for the order 8, there are several solution sets of pan-diagonal magic squares and they are really different from one another. Therefore we have to make each individual set of layer units according to the definition of each type of pan-diagonal objects.

From now on it will be more important for us to make 'case studies' and to know very well about how to design and make its own set of binary layer units for each object.

At first we have to define the basic conditions individually for building layer units.

## 4. How to Make the 'Composite and Complete' Magic Squares of Order 8?

For the first case we are going to study about composing the 'C&C' MS88.

We know about this type so well that we can expect we may surely check any step of composing them carefully and know how to do with it appropriately.

### 4-1. How to design and compose the layer units?

Let's do that just in the same way as we would often make such an ordinary magic square as usual, but by binary system only with '0' and '1'. Let's put all the conditions below to every layer unit, and call each one as the "Latin Square" from now on.

```
                 [Basic Positions]

61 62 63 64 57 58 59 60 61 62 63 64 57 58 59 60
           .-----------------------.
n5 n6 n7 n8|n1|n2|n3|n4|n5|n6|n7|n8|n1 n2 n3 n4
           |--+--+--+--+--+--+--+--|
13 14 15 16|n9|10|11|12|13|14|15|16|n9 10 11 12
           |--+--+--+--+--+--+--+--|
21 22 23 24|17|18|19|20|21|22|23|24|17 18 19 20
           |--+--+--+--+--+--+--+--|
29 30 31 32|25|26|27|28|29|30|31|32|25 26 27 28
           |--+--+--+--+--+--+--+--|
37 38 39 40|33|34|35|36|37|38|39|40|33 34 35 36
           |--+--+--+--+--+--+--+--|
45 46 47 48|41|42|43|44|45|46|47|48|41 42 43 44
           |--+--+--+--+--+--+--+--|
53 54 55 56|49|50|51|52|53|54|55|56|49 50 51 52
           |--+--+--+--+--+--+--+--|
61 62 63 64|57|58|59|60|61|62|63|64|57 58 59 60
           '-----------------------'
n5 n6 n7 n8 n1 n2 n3 n4 n5 n6 n7 n8 n1 n2 n3 n4
```

```
** 'Composite Conditions': **

n1+n2+n9+n10=2;
n2+n3+n10+n11=2;
n3+n4+n11+n12=2;
n4+n5+n12+n13=2;
n5+n6+n13+n14=2;
n6+n7+n14+n15=2;
n7+n8+n15+n16=2;
n8+n1+n16+n9=2;
n9+n10+n17+n18=2;
n10+n11+n18+n19=2;
n11+n12+n19+n20=2;
n12+n13+n20+n21=2;
n13+n14+n21+n22=2;
n14+n15+n22+n23=2;
n15+n16+n23+n24=2;
n16+n9+n24+n17=2;
n17+n18+n25+n26=2;
n18+n19+n26+n27=2;
n19+n20+n27+n28=2;
n20+n21+n28+n29=2;
n21+n22+n29+n30=2;   n22+n23+n30+n31=2;   n23+n24+n31+n32=2;
n24+n17+n32+n25=2;   n25+n26+n33+n34=2;   n26+n27+n34+n35=2;
n27+n28+n35+n36=2;   n28+n29+n36+n37=2;   n29+n30+n37+n38=2;
n30+n31+n38+n39=2;   n31+n32+n39+n40=2;   n32+n25+n40+n33=2;   . . . . . .

** Every row, every column and every pan-diagonal **
**  must add up to the same Magic Constant: 4 **
n1+n2+n3+n4+n5+n6+n7+n8=4;          n1+n9+n17+n25+n33+n41+n49+n57=4;
n9+n10+n11+n12+n13+n14+n15+n16=4;   n2+n10+n18+n26+n34+n42+n50+n58=4;
n17+n18+n19+n20+n21+n22+n23+n24=4;  n3+n11+n19+n27+n35+n43+n51+n59=4;
n25+n26+n27+n28+n29+n30+n31+n32=4;  n4+n12+n20+n28+n36+n44+n52+n60=4;
n33+n34+n35+n36+n37+n38+n39+n40=4;  n5+n13+n21+n29+n37+n45+n53+n61=4;
n41+n42+n43+n44+n45+n46+n47+n48=4;  n6+n14+n22+n30+n38+n46+n54+n62=4;
n49+n50+n51+n52+n53+n54+n55+n56=4;  n7+n15+n23+n31+n39+n47+n55+n63=4;
n57+n58+n59+n60+n61+n62+n63+n64=4;  n8+n16+n24+n32+n40+n48+n56+n64=4;

** Pan-diagonal Conditions: **
n1+n10+n19+n28+n37+n46+n55+n64=4;   n1+n16+n23+n30+n37+n44+n51+n58=4;
n2+n11+n20+n29+n38+n47+n56+n57=4;   n2+n9+n24+n31+n38+n45+n52+n59=4;
```

```
n3+n12+n21+n30+n39+n48+n49+n58=4;   n3+n10+n17+n32+n39+n46+n53+n60=4;
n4+n13+n22+n31+n40+n41+n50+n59=4;   n4+n11+n18+n25+n40+n47+n54+n61=4;
n5+n14+n23+n32+n33+n42+n51+n60=4;   n5+n12+n19+n26+n33+n48+n55+n62=4;
n6+n15+n24+n25+n34+n43+n52+n61=4;   n6+n13+n20+n27+n34+n41+n56+n63=4;
n7+n16+n17+n26+n35+n44+n53+n62=4;   n7+n14+n21+n28+n35+n42+n49+n64=4;
n8+n9+n18+n27+n36+n45+n54+n63=4;    n8+n15+n22+n29+n36+n43+n50+n57=4;

** Complete Condtions: **
** Complementary pairs of 1 must be located as follows **
n1+n37=1;   n2+n38=1;   n3+n39=1;   n4+n40=1;   n5+n33=1;
n6+n34=1;   n7+n35=1;   n8+n36=1;   n9+n45=1;   n10+n46=1;
n11+n47=1;  n12+n48=1;  n13+n41=1;  n14+n42=1;  n15+n43=1;
n16+n44=1;  n17+n53=1;  n18+n54=1;  n19+n55=1;  n20+n56=1;
n21+n49=1;  n22+n50=1;  n23+n51=1;  n24+n52=1;  n25+n61=1;
n26+n62=1;  n27+n63=1;  n28+n64=1;  n29+n57=1;  n30+n58=1;
n31+n59=1;  n32+n60=1;
```

I took these basic conditions above and wrote my computer program as follows.

I prepared 32 memory arrays of flag sets to watch every row, every column and every pan-diagonal add up to 4, checking how often any value of the position is used. If the value is used less than 4 times, it means 'usable.' But if not, it means 'not usable.' The next step we have to go varies according to the state of flags.

(n1, n37), (n2, n38), (n3, n39), ..., (n32, n60) are the characteristic complementary pairs of 'Complete' type of magic squares of order 8. We can define them two by two in the same procedure for each pair as: `n37=1-n1; n38=1-n2; n39=1-n3; ...; n60=1-n32;`

When we set `n1` and `n37`, we have to make the concerned flags count up by one, and when we return back to the same step after doing any job, we have to make them count down by one.

```c
/** 'Composite & Complete' Magic Squares of Order 8 **/
/** Made by "New Euler's Method" with Binary System **/
/** 'CES8CC.c' built by Kanji Setsuda **/
/**  on Aug. 8, 2003;  Mar.25, 2006;  **/
/**  Working on MacOSX and Xcode 2.1  **/
/**/
#include <stdio.h>
/**/
long int cnt, cnt2;
long cntr[5];
long n1c[65];
short cc, lcnt, cnt3;
short nm[65], uflg[65], unm[7];
short anm[5][72];
short mtc[33][33];
short tlu[33][65];
short rw1[2], cl1[2], pd1[2], pb1[2];
short rw2[2], cl2[2], pd2[2], pb2[2];
short rw3[2], cl3[2], pd3[2], pb3[2];
short rw4[2], cl4[2], pd4[2], pb4[2];
short rw5[2], cl5[2], pd5[2], pb5[2];
short rw6[2], cl6[2], pd6[2], pb6[2];
short rw7[2], cl7[2], pd7[2], pb7[2];
short rw8[2], cl8[2], pd8[2], pb8[2];
/**/
/* . . . . . . */
/**/
int main(){
 short n;
```

```
  printf("\n** 'Composite & Complete' Magic Squares of Order 8 **\n");
  printf("** Made by 'New Euler's Method' with Binary System **\n");
  for(n=0;n<65;n++){nm[n]=0;}
  for(n=0;n<2;n++){
    rw1[n]=0; cl1[n]=0; pd1[n]=0; pb1[n]=0;
    rw2[n]=0; cl2[n]=0; pd2[n]=0; pb2[n]=0;
    rw3[n]=0; cl3[n]=0; pd3[n]=0; pb3[n]=0;
    rw4[n]=0; cl4[n]=0; pd4[n]=0; pb4[n]=0;
    rw5[n]=0; cl5[n]=0; pd5[n]=0; pb5[n]=0;
    rw6[n]=0; cl6[n]=0; pd6[n]=0; pb6[n]=0;
    rw7[n]=0; cl7[n]=0; pd7[n]=0; pb7[n]=0;
    rw8[n]=0; cl8[n]=0; pd8[n]=0; pb8[n]=0;}
  cc=1; cnt=0;
  stp01();      /* Make the Latin Squares */
  printf("\n[Latin Squares of Binary Decompositions]\n");
  prlunit();    /* Print the Latin Squares */
  printf("\n[Compositions of 'Composite & Complete' MS88: Used Units//////Sol.Number#]\n");
  lcnt=cnt; cnt=0; cnt3=0;
  cmbcmp();     /* Combine, Compose and Print */
  if(cnt3>0){ansprint(cnt3);}
  printf(" [Count = %d]\n",cnt);
  printf("\n[Count according to the Value of n1]\n");
  prn1c();
  printf("* OK! *\n");
 return 0;
}
/* Make the Latin Squares */
/* Set n1 & n37 */
void stp01(){
 short a,b;
  for(a=0;a<2;a++){b=cc-a;
    if((rw1[a]<4)&&(cl1[a]<4)&&(pd1[a]<4)&&(pb1[a]<4)){
      if((rw5[b]<4)&&(cl5[b]<4)&&(pd1[b]<4)&&(pb1[b]<4)){
        nm[1]=a; nm[37]=b;
        rw1[a]++; cl1[a]++; pd1[a]++; pb1[a]++;
        rw5[b]++; cl5[b]++; pd1[b]++; pb1[b]++;
        stp02();
        rw1[a]--; cl1[a]--; pd1[a]--; pb1[a]--;
        rw5[b]--; cl5[b]--; pd1[b]--; pb1[b]--;
    }}
  }
}
/* Set n2 & n38 */
void stp02(){
 short a,b;
  for(a=1;a>=0;a--){b=cc-a;
    if((rw1[a]<4)&&(cl2[a]<4)&&(pd2[a]<4)&&(pb2[a]<4)){
      if((rw5[b]<4)&&(cl6[b]<4)&&(pd2[b]<4)&&(pb2[b]<4)){
        nm[2]=a; nm[38]=b;
        rw1[a]++; cl2[a]++; pd2[a]++; pb2[a]++;
        rw5[b]++; cl6[b]++; pd2[b]++; pb2[b]++;
        stp03();
        rw1[a]--; cl2[a]--; pd2[a]--; pb2[a]--;
        rw5[b]--; cl6[b]--; pd2[b]--; pb2[b]--;
    }}
  }
}
/* Set n4 & n40 */
void stp03(){
 short a,b;
  for(a=1;a>=0;a--){b=cc-a;
    if((rw1[a]<4)&&(cl4[a]<4)&&(pd4[a]<4)&&(pb4[a]<4)){
      if((rw5[b]<4)&&(cl8[b]<4)&&(pd4[b]<4)&&(pb4[b]<4)){
        nm[4]=a; nm[40]=b;
```

```
        rw1[a]++; cl4[a]++; pd4[a]++; pb4[a]++;
        rw5[b]++; cl8[b]++; pd4[b]++; pb4[b]++;
        stp04();
        rw1[a]--; cl4[a]--; pd4[a]--; pb4[a]--;
        rw5[b]--; cl8[b]--; pd4[b]--; pb4[b]--;
    }}
  }
}
/* Set n3 & n39 */
void stp04(){
 short a,b;
  for(a=0;a<2;a++){b=cc-a;
    if((rw1[a]<4)&&(cl3[a]<4)&&(pd3[a]<4)&&(pb3[a]<4)){
      if((rw5[b]<4)&&(cl7[b]<4)&&(pd3[b]<4)&&(pb3[b]<4)){
        nm[3]=a; nm[39]=b;
        rw1[a]++; cl3[a]++; pd3[a]++; pb3[a]++;
        rw5[b]++; cl7[b]++; pd3[b]++; pb3[b]++;
        stp05();
        rw1[a]--; cl3[a]--; pd3[a]--; pb3[a]--;
        rw5[b]--; cl7[b]--; pd3[b]--; pb3[b]--;
    }}
  }
}
/* Set n8 & n36 */
void stp05(){
 short a,b;
  for(a=1;a>=0;a--){b=cc-a;
    if((rw1[a]<4)&&(cl8[a]<4)&&(pd8[a]<4)&&(pb8[a]<4)){
      if((rw5[b]<4)&&(cl4[b]<4)&&(pd8[b]<4)&&(pb8[b]<4)){
        nm[8]=a; nm[36]=b;
        rw1[a]++; cl8[a]++; pd8[a]++; pb8[a]++;
        rw5[b]++; cl4[b]++; pd8[b]++; pb8[b]++;
        stp06();
        rw1[a]--; cl8[a]--; pd8[a]--; pb8[a]--;
        rw5[b]--; cl4[b]--; pd8[b]--; pb8[b]--;
    }}
  }
}
/* Set n7 & n35 */
void stp06(){
 short a,b;
  for(a=0;a<2;a++){b=cc-a;
    if((rw1[a]<4)&&(cl7[a]<4)&&(pd7[a]<4)&&(pb7[a]<4)){
      if((rw5[b]<4)&&(cl3[b]<4)&&(pd7[b]<4)&&(pb7[b]<4)){
        nm[7]=a; nm[35]=b;
        rw1[a]++; cl7[a]++; pd7[a]++; pb7[a]++;
        rw5[b]++; cl3[b]++; pd7[b]++; pb7[b]++;
        stp07();
        rw1[a]--; cl7[a]--; pd7[a]--; pb7[a]--;
        rw5[b]--; cl3[b]--; pd7[b]--; pb7[b]--;
    }}
  }
}
/* Set n5 & n33 */
void stp07(){
 short a,b;
  for(a=0;a<2;a++){b=cc-a;
    if((rw1[a]<4)&&(cl5[a]<4)&&(pd5[a]<4)&&(pb5[a]<4)){
      if((rw5[b]<4)&&(cl1[b]<4)&&(pd5[b]<4)&&(pb5[b]<4)){
        nm[5]=a; nm[33]=b;
        rw1[a]++; cl5[a]++; pd5[a]++; pb5[a]++;
        rw5[b]++; cl1[b]++; pd5[b]++; pb5[b]++;
        stp08();
        rw1[a]--; cl5[a]--; pd5[a]--; pb5[a]--;
```

```
         rw5[b]--; cl1[b]--; pd5[b]--; pb5[b]--;
      }}
    }
}
/* Set n6 & n34 */
void stp08(){
 short a,b;
   for(a=1;a>=0;a--){b=cc-a;
     if((rw1[a]<4)&&(cl6[a]<4)&&(pd6[a]<4)&&(pb6[a]<4)){
       if((rw5[b]<4)&&(cl2[b]<4)&&(pd6[b]<4)&&(pb6[b]<4)){
         nm[6]=a; nm[34]=b;
         rw1[a]++; cl6[a]++; pd6[a]++; pb6[a]++;
         rw5[b]++; cl2[b]++; pd6[b]++; pb6[b]++;
         stp09();
         rw1[a]--; cl6[a]--; pd6[a]--; pb6[a]--;
         rw5[b]--; cl2[b]--; pd6[b]--; pb6[b]--;
     }}
   }
}
/* Search Level 2 */
/* Set n9 & n45 */
void stp09(){
 short a,b;
   for(a=1;a>=0;a--){b=cc-a;
     if((rw2[a]<4)&&(cl1[a]<4)&&(pd8[a]<4)&&(pb2[a]<4)){
       if((rw6[b]<4)&&(cl5[b]<4)&&(pd8[b]<4)&&(pb2[b]<4)){
         nm[9]=a; nm[45]=b;
         rw2[a]++; cl1[a]++; pd8[a]++; pb2[a]++;
         rw6[b]++; cl5[b]++; pd8[b]++; pb2[b]++;
         stp10();
         rw2[a]--; cl1[a]--; pd8[a]--; pb2[a]--;
         rw6[b]--; cl5[b]--; pd8[b]--; pb2[b]--;
     }}
   }
}
/* Set n10 & n46 */
void stp10(){
 short a,b,c;
   for(a=0;a<2;a++){b=cc-a;
     if((rw2[a]<4)&&(cl2[a]<4)&&(pd1[a]<4)&&(pb3[a]<4)){
       if((rw6[b]<4)&&(cl6[b]<4)&&(pd1[b]<4)&&(pb3[b]<4)){
         nm[10]=a; nm[46]=b;
         rw2[a]++; cl2[a]++; pd1[a]++; pb3[a]++;
         rw6[b]++; cl6[b]++; pd1[b]++; pb3[b]++;
         c=nm[1]+nm[2]+nm[9]+a;
         if(c==2){stp11();}
         rw2[a]--; cl2[a]--; pd1[a]--; pb3[a]--;
         rw6[b]--; cl6[b]--; pd1[b]--; pb3[b]--;
     }}
   }
}
/* Set n12 & n48 */
void stp11(){
 short a,b,c;
   for(a=0;a<2;a++){b=cc-a;
     if((rw2[a]<4)&&(cl4[a]<4)&&(pd3[a]<4)&&(pb5[a]<4)){
       if((rw6[b]<4)&&(cl8[b]<4)&&(pd3[b]<4)&&(pb5[b]<4)){
         nm[12]=a; nm[48]=b;
         rw2[a]++; cl4[a]++; pd3[a]++; pb5[a]++;
         rw6[b]++; cl8[b]++; pd3[b]++; pb5[b]++;
         c=nm[2]+nm[10]-nm[4]-a;
         if(c==0){stp12();}
         rw2[a]--; cl4[a]--; pd3[a]--; pb5[a]--;
         rw6[b]--; cl8[b]--; pd3[b]--; pb5[b]--;
```

```
    }}
  }
}
/* Set n11 & n47 */
void stp12(){
 short a,b,c,d;
  for(a=1;a>=0;a--){b=cc-a;
    if((rw2[a]<4)&&(cl3[a]<4)&&(pd2[a]<4)&&(pb4[a]<4)){
      if((rw6[b]<4)&&(cl7[b]<4)&&(pd2[b]<4)&&(pb4[b]<4)){
        nm[11]=a; nm[47]=b;
        rw2[a]++; cl3[a]++; pd2[a]++; pb4[a]++;
        rw6[b]++; cl7[b]++; pd2[b]++; pb4[b]++;
        c=nm[2]+nm[3]+nm[10]+a; d=nm[3]+nm[4]+nm[12]+a;
        if((c==2)&&(d==2)){stp13();}
        rw2[a]--; cl3[a]--; pd2[a]--; pb4[a]--;
        rw6[b]--; cl7[b]--; pd2[b]--; pb4[b]--;
    }}
  }
}
/* Set n16 & n44 */
void stp13(){
 short a,b,c;
  for(a=0;a<2;a++){b=cc-a;
    if((rw2[a]<4)&&(cl8[a]<4)&&(pd7[a]<4)&&(pb1[a]<4)){
      if((rw6[b]<4)&&(cl4[b]<4)&&(pd7[b]<4)&&(pb1[b]<4)){
        nm[16]=a; nm[44]=b;
        rw2[a]++; cl8[a]++; pd7[a]++; pb1[a]++;
        rw6[b]++; cl4[b]++; pd7[b]++; pb1[b]++;
        c=nm[8]+nm[1]+nm[9]+a;
        if(c==2){stp14();}
        rw2[a]--; cl8[a]--; pd7[a]--; pb1[a]--;
        rw6[b]--; cl4[b]--; pd7[b]--; pb1[b]--;
    }}
  }
}
/* Set n15 & n43 */
void stp14(){
 short a,b,c;
  for(a=1;a>=0;a--){b=cc-a;
    if((rw2[a]<4)&&(cl7[a]<4)&&(pd6[a]<4)&&(pb8[a]<4)){
      if((rw6[b]<4)&&(cl3[b]<4)&&(pd6[b]<4)&&(pb8[b]<4)){
        nm[15]=a; nm[43]=b;
        rw2[a]++; cl7[a]++; pd6[a]++; pb8[a]++;
        rw6[b]++; cl3[b]++; pd6[b]++; pb8[b]++;
        c=nm[7]+nm[8]+nm[16]+a;
        if(c==2){stp15();}
        rw2[a]--; cl7[a]--; pd6[a]--; pb8[a]--;
        rw6[b]--; cl3[b]--; pd6[b]--; pb8[b]--;
    }}
  }
}
/* Set n13 & n41 */
void stp15(){
 short a,b,c;
  for(a=1;a>=0;a--){b=cc-a;
    if((rw2[a]<4)&&(cl5[a]<4)&&(pd4[a]<4)&&(pb6[a]<4)){
      if((rw6[b]<4)&&(cl1[b]<4)&&(pd4[b]<4)&&(pb6[b]<4)){
        nm[13]=a; nm[41]=b;
        rw2[a]++; cl5[a]++; pd4[a]++; pb6[a]++;
        rw6[b]++; cl1[b]++; pd4[b]++; pb6[b]++;
        c=nm[4]+nm[5]+nm[12]+a;
        if(c==2){stp16();}
        rw2[a]--; cl5[a]--; pd4[a]--; pb6[a]--;
        rw6[b]--; cl1[b]--; pd4[b]--; pb6[b]--;
```

```
    }}
  }
}
/* Set n14 & n42 */
void stp16(){
 short a,b,c,d;
  for(a=0;a<2;a++){b=cc-a;
    if((rw2[a]<4)&&(cl6[a]<4)&&(pd5[a]<4)&&(pb7[a]<4)){
      if((rw6[b]<4)&&(cl2[b]<4)&&(pd5[b]<4)&&(pb7[b]<4)){
        nm[14]=a; nm[42]=b;
        rw2[a]++; cl6[a]++; pd5[a]++; pb7[a]++;
        rw6[b]++; cl2[b]++; pd5[b]++; pb7[b]++;
        c=nm[5]+nm[6]+nm[13]+a; d=nm[6]+nm[7]+a+nm[15];
        if((c==2)&&(d==2)){stp17();}
        rw2[a]--; cl6[a]--; pd5[a]--; pb7[a]--;
        rw6[b]--; cl2[b]--; pd5[b]--; pb7[b]--;
    }}
  }
}
/* Search Level 3 */
/* Set n25 & n61 */
void stp17(){
 short a,b;
  for(a=1;a>=0;a--){b=cc-a;
    if((rw4[a]<4)&&(cl1[a]<4)&&(pd6[a]<4)&&(pb4[a]<4)){
      if((rw8[b]<4)&&(cl5[b]<4)&&(pd6[b]<4)&&(pb4[b]<4)){
        nm[25]=a; nm[61]=b;
        rw4[a]++; cl1[a]++; pd6[a]++; pb4[a]++;
        rw8[b]++; cl5[b]++; pd6[b]++; pb4[b]++;
        stp18();
        rw4[a]--; cl1[a]--; pd6[a]--; pb4[a]--;
        rw8[b]--; cl5[b]--; pd6[b]--; pb4[b]--;
    }}
  }
}
/* Set n26 & n62 */
void stp18(){
 short a,b,c;
  for(a=0;a<2;a++){b=cc-a;
    if((rw4[a]<4)&&(cl2[a]<4)&&(pd7[a]<4)&&(pb5[a]<4)){
      if((rw8[b]<4)&&(cl6[b]<4)&&(pd7[b]<4)&&(pb5[b]<4)){
        nm[26]=a; nm[62]=b;
        rw4[a]++; cl2[a]++; pd7[a]++; pb5[a]++;
        rw8[b]++; cl6[b]++; pd7[b]++; pb5[b]++;
        c=nm[25]+a+nm[33]+nm[34];
        if(c==2){stp19();}
        rw4[a]--; cl2[a]--; pd7[a]--; pb5[a]--;
        rw8[b]--; cl6[b]--; pd7[b]--; pb5[b]--;
    }}
  }
}
/* Set n28 & n64 */
void stp19(){
 short a,b,c;
  for(a=0;a<2;a++){b=cc-a;
    if((rw4[a]<4)&&(cl4[a]<4)&&(pd1[a]<4)&&(pb7[a]<4)){
      if((rw8[b]<4)&&(cl8[b]<4)&&(pd1[b]<4)&&(pb7[b]<4)){
        nm[28]=a; nm[64]=b;
        rw4[a]++; cl4[a]++; pd1[a]++; pb7[a]++;
        rw8[b]++; cl8[b]++; pd1[b]++; pb7[b]++;
        c=nm[26]+nm[34]-a-nm[36];
        if(c==0){stp20();}
        rw4[a]--; cl4[a]--; pd1[a]--; pb7[a]--;
        rw8[b]--; cl8[b]--; pd1[b]--; pb7[b]--;
```

```
      }}
    }
}
/* Set n27 & n63 */
void stp20(){
 short a,b,c,d;
   for(a=1;a>=0;a--){b=cc-a;
     if((rw4[a]<4)&&(cl3[a]<4)&&(pd8[a]<4)&&(pb6[a]<4)){
       if((rw8[b]<4)&&(cl7[b]<4)&&(pd8[b]<4)&&(pb6[b]<4)){
         nm[27]=a; nm[63]=b;
         rw4[a]++; cl3[a]++; pd8[a]++; pb6[a]++;
         rw8[b]++; cl7[b]++; pd8[b]++; pb6[b]++;
         c=nm[26]+a+nm[34]+nm[35]; d=a+nm[28]+nm[35]+nm[36];
         if((c==2)&&(d==2)){stp21();}
         rw4[a]--; cl3[a]--; pd8[a]--; pb6[a]--;
         rw8[b]--; cl7[b]--; pd8[b]--; pb6[b]--;
      }}
    }
}
/* Set n31 & n59 */
void stp21(){
 short a,b,c;
   for(a=1;a>=0;a--){b=cc-a;
     if((rw4[a]<4)&&(cl7[a]<4)&&(pd4[a]<4)&&(pb2[a]<4)){
       if((rw8[b]<4)&&(cl3[b]<4)&&(pd4[b]<4)&&(pb2[b]<4)){
         nm[31]=a; nm[59]=b;
         rw4[a]++; cl7[a]++; pd4[a]++; pb2[a]++;
         rw8[b]++; cl3[b]++; pd4[b]++; pb2[b]++;
         c=nm[25]+nm[33]-a-nm[39];
         if(c==0){stp22();}
         rw4[a]--; cl7[a]--; pd4[a]--; pb2[a]--;
         rw8[b]--; cl3[b]--; pd4[b]--; pb2[b]--;
      }}
    }
}
/* Set n32 & n60 */
void stp22(){
 short a,b,c,d;
   for(a=0;a<2;a++){b=cc-a;
     if((rw4[a]<4)&&(cl8[a]<4)&&(pd5[a]<4)&&(pb3[a]<4)){
       if((rw8[b]<4)&&(cl4[b]<4)&&(pd5[b]<4)&&(pb3[b]<4)){
         nm[32]=a; nm[60]=b;
         rw4[a]++; cl8[a]++; pd5[a]++; pb3[a]++;
         rw8[b]++; cl4[b]++; pd5[b]++; pb3[b]++;
         c=nm[31]+a+nm[39]+nm[40]; d=nm[25]+a+nm[33]+nm[40];
         if((c==2)&&(d==2)){stp23();}
         rw4[a]--; cl8[a]--; pd5[a]--; pb3[a]--;
         rw8[b]--; cl4[b]--; pd5[b]--; pb3[b]--;
      }}
    }
}
/* Set n30 & n58 */
void stp23(){
 short a,b,c;
   for(a=0;a<2;a++){b=cc-a;
     if((rw4[a]<4)&&(cl6[a]<4)&&(pd3[a]<4)&&(pb1[a]<4)){
       if((rw8[b]<4)&&(cl2[b]<4)&&(pd3[b]<4)&&(pb1[b]<4)){
         nm[30]=a; nm[58]=b;
         rw4[a]++; cl6[a]++; pd3[a]++; pb1[a]++;
         rw8[b]++; cl2[b]++; pd3[b]++; pb1[b]++;
         c=a+nm[31]+nm[38]+nm[39];
         if(c==2){stp24();}
         rw4[a]--; cl6[a]--; pd3[a]--; pb1[a]--;
         rw8[b]--; cl2[b]--; pd3[b]--; pb1[b]--;
```

```
    }}
  }
}
/* Set n29 & n57 */
void stp24(){
 short a,b,c,d;
  for(a=1;a>=0;a--){b=cc-a;
    if((rw4[a]<4)&&(cl5[a]<4)&&(pd2[a]<4)&&(pb8[a]<4)){
      if((rw8[b]<4)&&(cl1[b]<4)&&(pd2[b]<4)&&(pb8[b]<4)){
        nm[29]=a; nm[57]=b;
        rw4[a]++; cl5[a]++; pd2[a]++; pb8[a]++;
        rw8[b]++; cl1[b]++; pd2[b]++; pb8[b]++;
        c=nm[28]+a+nm[36]+nm[37]; d=a+nm[30]+nm[37]+nm[38];
        if((c==2)&&(d==2)){stp25();}
        rw4[a]--; cl5[a]--; pd2[a]--; pb8[a]--;
        rw8[b]--; cl1[b]--; pd2[b]--; pb8[b]--;
    }}
  }
}
/* Search Level 4 */
/* Set n17 & n53 */
void stp25(){
 short a,b;
  for(a=0;a<2;a++){b=cc-a;
    if((rw3[a]<4)&&(cl1[a]<4)&&(pd7[a]<4)&&(pb3[a]<4)){
      if((rw7[b]<4)&&(cl5[b]<4)&&(pd7[b]<4)&&(pb3[b]<4)){
        nm[17]=a; nm[53]=b;
        rw3[a]++; cl1[a]++; pd7[a]++; pb3[a]++;
        rw7[b]++; cl5[b]++; pd7[b]++; pb3[b]++;
        stp26();
        rw3[a]--; cl1[a]--; pd7[a]--; pb3[a]--;
        rw7[b]--; cl5[b]--; pd7[b]--; pb3[b]--;
    }}
  }
}
/* Set n18 & n54 */
void stp26(){
 short a,b,c,d;
  for(a=1;a>=0;a--){b=cc-a;
    if((rw3[a]<4)&&(cl2[a]<4)&&(pd8[a]<4)&&(pb4[a]<4)){
      if((rw7[b]<4)&&(cl6[b]<4)&&(pd8[b]<4)&&(pb4[b]<4)){
        nm[18]=a; nm[54]=b;
        rw3[a]++; cl2[a]++; pd8[a]++; pb4[a]++;
        rw7[b]++; cl6[b]++; pd8[b]++; pb4[b]++;
        c=nm[9]+nm[10]+nm[17]+a; d=nm[17]+a+nm[25]+nm[26];
        if((c==2)&&(d==2)){stp27();}
        rw3[a]--; cl2[a]--; pd8[a]--; pb4[a]--;
        rw7[b]--; cl6[b]--; pd8[b]--; pb4[b]--;
    }}
  }
}
/* Set n20 & n56 */
void stp27(){
 short a,b,c;
  for(a=1;a>=0;a--){b=cc-a;
    if((rw3[a]<4)&&(cl4[a]<4)&&(pd2[a]<4)&&(pb6[a]<4)){
      if((rw7[b]<4)&&(cl8[b]<4)&&(pd2[b]<4)&&(pb6[b]<4)){
        nm[20]=a; nm[56]=b;
        rw3[a]++; cl4[a]++; pd2[a]++; pb6[a]++;
        rw7[b]++; cl8[b]++; pd2[b]++; pb6[b]++;
        c=nm[10]+nm[18]-nm[12]-a;
        if(c==0){stp28();}
        rw3[a]--; cl4[a]--; pd2[a]--; pb6[a]--;
        rw7[b]--; cl8[b]--; pd2[b]--; pb6[b]--;
```

```
    }}
  }
}
/* Set n19 & n55 */
void stp28(){
 short a,b,c,d;
  for(a=0;a<2;a++){b=cc-a;
    if((rw3[a]<4)&&(cl3[a]<4)&&(pd1[a]<4)&&(pb5[a]<4)){
      if((rw7[b]<4)&&(cl7[b]<4)&&(pd1[b]<4)&&(pb5[b]<4)){
        nm[19]=a; nm[55]=b;
        rw3[a]++; cl3[a]++; pd1[a]++; pb5[a]++;
        rw7[b]++; cl7[b]++; pd1[b]++; pb5[b]++;
        c=nm[18]+a+nm[26]+nm[27]; d=a+nm[20]+nm[27]+nm[28];
        if((c==2)&&(d==2)){stp29();}
        rw3[a]--; cl3[a]--; pd1[a]--; pb5[a]--;
        rw7[b]--; cl7[b]--; pd1[b]--; pb5[b]--;
    }}
  }
}
/* Set n23 & n51 */
void stp29(){
 short a,b,c;
  for(a=0;a<2;a++){b=cc-a;
    if((rw3[a]<4)&&(cl7[a]<4)&&(pd5[a]<4)&&(pb1[a]<4)){
      if((rw7[b]<4)&&(cl3[b]<4)&&(pd5[b]<4)&&(pb1[b]<4)){
        nm[23]=a; nm[51]=b;
        rw3[a]++; cl7[a]++; pd5[a]++; pb1[a]++;
        rw7[b]++; cl3[b]++; pd5[b]++; pb1[b]++;
        c=nm[9]+nm[17]-nm[15]-a;
        if(c==0){stp30();}
        rw3[a]--; cl7[a]--; pd5[a]--; pb1[a]--;
        rw7[b]--; cl3[b]--; pd5[b]--; pb1[b]--;
    }}
  }
}
/* Set n24 & n52 */
void stp30(){
 short a,b,c,d;
  for(a=1;a>=0;a--){b=cc-a;
    if((rw3[a]<4)&&(cl8[a]<4)&&(pd6[a]<4)&&(pb2[a]<4)){
      if((rw7[b]<4)&&(cl4[b]<4)&&(pd6[b]<4)&&(pb2[b]<4)){
        nm[24]=a; nm[52]=b;
        rw3[a]++; cl8[a]++; pd6[a]++; pb2[a]++;
        rw7[b]++; cl4[b]++; pd6[b]++; pb2[b]++;
        c=nm[23]+a+nm[31]+nm[32]; d=a+nm[17]+nm[32]+nm[25];
        if((c==2)&&(d==2)){stp31();}
        rw3[a]--; cl8[a]--; pd6[a]--; pb2[a]--;
        rw7[b]--; cl4[b]--; pd6[b]--; pb2[b]--;
    }}
  }
}
/* Set n22 & n50 */
void stp31(){
 short a,b,c,d;
  for(a=1;a>=0;a--){b=cc-a;
    if((rw3[a]<4)&&(cl6[a]<4)&&(pd4[a]<4)&&(pb8[a]<4)){
      if((rw7[b]<4)&&(cl2[b]<4)&&(pd4[b]<4)&&(pb8[b]<4)){
        nm[22]=a; nm[50]=b;
        rw3[a]++; cl6[a]++; pd4[a]++; pb8[a]++;
        rw7[b]++; cl2[b]++; pd4[b]++; pb8[b]++;
        c=nm[14]+nm[15]+a+nm[23]; d=a+nm[23]+nm[30]+nm[31];
        if((c==2)&&(d==2)){stp32();}
        rw3[a]--; cl6[a]--; pd4[a]--; pb8[a]--;
        rw7[b]--; cl2[b]--; pd4[b]--; pb8[b]--;
```

```
    }}
  }
}
/* Set n21 & n49 */
void stp32(){
 short a,b,c1,c2,d1,d2;
  for(a=0;a<2;a++){b=cc-a;
    if((rw3[a]<4)&&(cl5[a]<4)&&(pd3[a]<4)&&(pb7[a]<4)){
      if((rw7[b]<4)&&(cl1[b]<4)&&(pd3[b]<4)&&(pb7[b]<4)){
        nm[21]=a; nm[49]=b;
        rw3[a]++; cl5[a]++; pd3[a]++; pb7[a]++;
        rw7[b]++; cl1[b]++; pd3[b]++; pb7[b]++;
        c1=nm[12]+nm[13]+nm[20]+a; c2=nm[13]+nm[14]+a+nm[22];
        d1=nm[20]+a+nm[28]+nm[29]; d2=a+nm[22]+nm[29]+nm[30];
        if((c1==2)&&(c2==2)&&(d1==2)&&(d2==2)){ansrecord();}
        rw3[a]--; cl5[a]--; pd3[a]--; pb7[a]--;
        rw7[b]--; cl1[b]--; pd3[b]--; pb7[b]--;
    }}
  }
}
/**/
/* Record the Answers */
void ansrecord(){
 short n;
  cnt++;
  tlu[cnt-1][0]=cnt;
  for(n=1;n<65;n++){tlu[cnt-1][n]=nm[n];}
}
/**/
/* Combine, Compose and Print */
void cmbcmp(){
 short a1,a2,a3,a4,a5,a6,n,d,fc;
  for(a1=0;a1<(lcnt/2);a1++){unm[1]=a1+1;
    for(a2=0;a2<lcnt;a2++){
      if(mtc[a2+1][a1+1]==32){unm[2]=a2+1; cnt2=0;
      for(a3=0;a3<lcnt;a3++){
        if((mtc[a3+1][a1+1]==32)&&(mtc[a3+1][a2+1]==32)){unm[3]=a3+1;
        for(a4=0;a4<lcnt;a4++){
          if((mtc[a4+1][a1+1]==32)&&(mtc[a4+1][a2+1]==32)){
          if(mtc[a4+1][a3+1]==32){unm[4]=a4+1;
          for(a5=0;a5<lcnt;a5++){
            if((mtc[a5+1][a1+1]==32)&&(mtc[a5+1][a2+1]==32)){
            if((mtc[a5+1][a3+1]==32)&&(mtc[a5+1][a4+1]==32)){unm[5]=a5+1;
            for(a6=0;a6<lcnt;a6++){
              if((mtc[a6+1][a1+1]==32)&&(mtc[a6+1][a2+1]==32)&&(mtc[a6+1][a3+1]==32)){
              if((mtc[a6+1][a4+1]==32)&&(mtc[a6+1][a5+1]==32)){unm[6]=a6+1;
                for(n=1;n<65;n++){uflg[n]=0;}
                for(n=1;n<65;n++){
                  d=tlu[a1][n]*32+tlu[a2][n]*16+tlu[a3][n]*8+tlu[a4][n]*4+tlu[a5][n]*2+tlu[a6][n]+1;
                  nm[n]=d; uflg[d]++;
                }
                fc=0;
                for(n=1;n<65;n++){if(uflg[n]==1){fc++;}else{break;}}
                if(fc==64){
                  if((nm[1]<nm[64])&&(nm[1]<nm[8])&&(nm[1]<nm[57])&&(nm[2]>nm[9])){
                    prans();}
                }
    }}}}}}}}}}}}
  }
}
/**/
/* Classify and Print the Latin Squares */
void prlunit(){
 short t,l,l8,m,n;
```

```
  for(m=0;m<=cnt;m++){
    for(n=0;n<=cnt;n++){mtc[m][n]=-1;}
  }
  for(m=0;m<cnt;m++){
    for(n=0;n<cnt;n++){
      t=0;
      for(l=1;l<65;l++){if(tlu[m][l]==tlu[n][l]){t++;}}
      mtc[m+1][n+1]=t;
    }
  }
  for(t=0;t<cnt;t=t+8){
    printf("%9d/%9d/%9d/%9d/%9d/%9d/%9d/%9d/\n",
      t+1,t+2,t+3,t+4,t+5,t+6,t+7,t+8);
    for(l=0;l<8;l++){l8=l*8;
      for(m=t;m<(t+8);m++){
        printf("  ");
        for(n=1;n<9;n++){printf("%d",tlu[m][l8+n]);}
      }
      printf("\n");
    }
  }
  printf(" [Count of Latin Squares = %d]\n",cnt);
  printf("\n [Table of Matching Digits]\n");
  printf("  *|");
  for(n=1;n<=cnt;n++){printf("%3d",n);}
  printf("\n");
  printf(" --+------------------------------------------------------------------------------------------------------------------------\n");
  for(m=1;m<=cnt;m++){
    printf("%3d|",m);
    for(n=1;n<=cnt;n++){t=mtc[m][n];
      if(t>=0){printf("%3d",t);}else{printf("  -");}}
    printf("\n");
  }
}
/**/
/* Print the Answers */
void prans(){
 short n;
  cnt++; cnt2++;
  n1c[nm[1]]++;
  if(cnt2==1){
    cntr[cnt3]=cnt; cntr[cnt3+1]=0;
    for(n=1;n<65;n++){anm[cnt3][n]=nm[n]; anm[cnt3+1][n]=0;}
    for(n=1;n<7;n++){anm[cnt3][64+n]=unm[n];}
    cnt3++;
    if(cnt3==3){ansprint(cnt3); cnt3=0;}
  }
}
/**/
/* Print 3 Answers */
void ansprint(short x){
 short l,l8,m,n;
  for(m=0;m<x;m++){
    printf("%3d/%2d/%2d/%2d/%2d/%2d/%6d",
      anm[m][65],anm[m][66],anm[m][67],anm[m][68],anm[m][69],anm[m][70],cntr[m]);
    if(m<(x-1)){printf(" ");}
  }
  printf("\n");
  for(l=0;l<8;l++){l8=l*8;
    for(m=0;m<x;m++){
      printf(" ");
      for(n=1;n<9;n++){printf("%3d",anm[m][l8+n]);}
      if(m<(x-1)){printf(" ");}
    }
```

```
    printf("\n");
  }
  printf("\n");
}
/**/
/* Print the Count according to n1 */
void prn1c(){
 short m;
  for(m=1;m<33;m++){
    printf("%4d:%6d",m,n1c[m]);
    if(m%8==0){printf("\n");}
  }
}
/**/
```

All answers are stored in the memory array `tlu[33][65]`, so that you can see and use the data for another purpose any time you want to.

The next list shows all the 32 Latin Squares I could get by this program.

```
[Latin Squares of Binary Decompositions]
        1/        2/        3/        4/        5/        6/        7/        8/
  01010101  01010101  01010101  01010101  01010101  01010101  01010101  01010101
  10101010  10101010  10101010  10101010  01010101  01010101  01010101  01010101
  01010101  10101010  01010101  10101010  01010101  10101010  01010101  10101010
  10101010  10101010  01010101  01010101  10101010  10101010  01010101  01010101
  10101010  10101010  10101010  10101010  10101010  10101010  10101010  10101010
  01010101  01010101  01010101  01010101  10101010  10101010  10101010  10101010
  10101010  01010101  10101010  01010101  10101010  01010101  10101010  01010101
  01010101  01010101  10101010  10101010  01010101  01010101  10101010  10101010
        9/       10/       11/       12/       13/       14/       15/       16/
  01011010  01111000  01001011  01101001  00011110  00111100  00001111  00101101
  10100101  10000111  10110100  10010110  11100001  11000011  11110000  11010010
  01011010  01111000  01001011  01101001  00011110  00111100  00001111  00101101
  10100101  10000111  10110100  10010110  11100001  11000011  11110000  11010010
  01011010  01111000  01001011  01101001  00011110  00111100  00001111  00101101
  10100101  10000111  10110100  10010110  11100001  11000011  11110000  11010010
  01011010  01111000  01001011  01101001  00011110  00111100  00001111  00101101
  10100101  10000111  10110100  10010110  11100001  11000011  11110000  11010010
       17/       18/       19/       20/       21/       22/       23/       24/
  11010010  11110000  11000011  11100001  10010110  10110100  10000111  10100101
  00101101  00001111  00111100  00011110  01101001  01001011  01111000  01011010
  11010010  11110000  11000011  11100001  10010110  10110100  10000111  10100101
  00101101  00001111  00111100  00011110  01101001  01001011  01111000  01011010
  11010010  11110000  11000011  11100001  10010110  10110100  10000111  10100101
  00101101  00001111  00111100  00011110  01101001  01001011  01111000  01011010
  11010010  11110000  11000011  11100001  10010110  10110100  10000111  10100101
  00101101  00001111  00111100  00011110  01101001  01001011  01111000  01011010
       25/       26/       27/       28/       29/       30/       31/       32/
  10101010  10101010  10101010  10101010  10101010  10101010  10101010  10101010
  10101010  10101010  10101010  10101010  01010101  01010101  01010101  01010101
  01010101  10101010  01010101  10101010  01010101  10101010  01010101  10101010
  10101010  10101010  01010101  01010101  10101010  10101010  01010101  01010101
  01010101  01010101  01010101  01010101  01010101  01010101  01010101  01010101
  01010101  01010101  01010101  01010101  10101010  10101010  10101010  10101010
  10101010  01010101  10101010  01010101  10101010  01010101  10101010  01010101
  01010101  01010101  10101010  10101010  01010101  01010101  10101010  10101010
 [Count of Latin Squares = 32]
```

### 4-2. How to Pick up and Combine 6 Latin Squares to Compose the Object?

We have got so many Latin Squares as 32. How can we choose 6 units to combine and compose each 'Composite & Complete' Magic Squares of order 8?

$32^6$ = 32 * 32 * 32 * 32 * 32 * 32 = 1073741824

Do we have to examine so many answers as one billion, know whether each of them is correct or not? It will surely take too long time for us to go on.

We expect correct solutions be counted no more than 368640. I am afraid too many wrong answers should be produced in the process of combining without any selection or examination in advance.

But, what makes them wrong? How can we stop that?

We have to watch some examples of wrong answers to analyze.

```
[Samples of Wrong Solutions: Used Units ///// Sol_No.]
   1/ 1/ 1/ 4/ 6/ 7/    ??     1/ 2/ 1/ 9/12/18/    ??     1/ 3/ 1/ 9/12/18/    ??
   1 64  1 64  1 64  1 64      2 64  4 62  7 57  5 59      2 64  4 62  7 57  5 59
  61  4 61  4 61  4 61  4     63  1 61  3 58  8 60  6     63  1 61  3 58  8 60  6
   7 58  7 58  7 58  7 58     18 48 20 46 23 41 21 43      2 64  4 62  7 57  5 59
  59  6 59  6 59  6 59  6     63  1 61  3 58  8 60  6     47 17 45 19 42 24 44 22
  64  1 64  1 64  1 64  1     58  8 60  6 63  1 61  3     58  8 60  6 63  1 61  3
   4 61  4 61  4 61  4 61      7 57  5 59  2 64  4 62      7 57  5 59  2 64  4 62
  58  7 58  7 58  7 58  7     42 24 44 22 47 17 45 19     58  8 60  6 63  1 61  3
   6 59  6 59  6 59  6 59      7 57  5 59  2 64  4 62     23 41 21 43 18 48 20 46

   1/32/ 4/ 6/ 7/ 9/    ??     2/31/ 3/ 5/ 8/ 9/    ??     3/30/ 2/ 5/ 8/ 9/    ??
  17 48 17 48 18 47 18 47     17 48 17 48 18 47 18 47     17 48 17 48 18 47 18 47
  42 23 42 23 41 24 41 24     42 23 42 23 41 24 41 24     42 23 42 23 41 24 41 24
  29 36 29 36 30 35 30 35     35 30 35 30 36 29 36 29     27 38 27 38 28 37 28 37
  38 27 38 27 37 28 37 28     38 27 38 27 37 28 37 28     30 35 30 35 29 36 29 36
  47 18 47 18 48 17 48 17     47 18 47 18 48 17 48 17     47 18 47 18 48 17 48 17
  24 41 24 41 23 42 23 42     24 41 24 41 23 42 23 42     24 41 24 41 23 42 23 42
  35 30 35 30 36 29 36 29     29 36 29 36 30 35 30 35     37 28 37 28 38 27 38 27
  28 37 28 37 27 38 27 38     28 37 28 37 27 38 27 38     36 29 36 29 35 30 35 30

   1/ 2/ 9/12/18/14/    ??     1/ 3/ 9/12/18/14/    ??     1/ 5/ 9/12/14/15/    ??
   3 63  8 60 14 50  9 53      3 63  8 60 14 50  9 53      1 61  7 59 16 52 10 54
  62  2 57  5 51 15 56 12     62  2 57  5 51 15 56 12     48 20 42 22 33 29 39 27
  19 47 24 44 30 34 25 37      3 63  8 60 14 50  9 53      1 61  7 59 16 52 10 54
  62  2 57  5 51 15 56 12     46 18 41 21 35 31 40 28     64  4 58  6 49 13 55 11
  51 15 56 12 62  2 57  5     51 15 56 12 62  2 57  5     49 13 55 11 64  4 58  6
  14 50  9 53  3 63  8 60     14 50  9 53  3 63  8 60     32 36 26 38 17 45 23 43
  35 31 40 28 46 18 41 21     51 15 56 12 62  2 57  5     49 13 55 11 64  4 58  6
  14 50  9 53  3 63  8 60     30 34 25 37 19 47 24 44     16 52 10 54  1 61  7 59

  . . . . . .
```

I noticed that we have to avoid using any combination of the same unit twice or more often, since it should make wrong answers against the Def (3) of Complete Euler Squares. I also noticed that using any combination of such pairs as `(1/, 32/)`, `(2/, 31/)`, `(3/, 30/)`, `(4/, 29/)`, `...`, `(15/, 18/)`, `(16/, 17/)` should be wrong. Each of those pairs is really a 'Self-Complementary' unit to the other partner.

I noticed that any combination of such pairs as `(1/, 2/)`, `(1/, 3/)`, `(1/, 5/)`, `(1/, 8/)`, `(1/, 31/)`, `(2/, 4/)`, `(2/, 7/)`, `...`, should also make the answer wrong.

I have finally known that the combination of any two units which are too similar or too different would surely make wrong answers against the Def (3) of C.Euler.S.

An idea came up to my mind. Why don't we measure how similar any two units are?

I counted how many digits are the same between any two units picked up and made the reference table of those data on memory array `mtc[33][33]` as shown below:

Why don't we consult with that table just before we combine any two Latin units?

** Data Table: How Similar are Any Two Units to Each Other? **

| * | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 64 | 48 | 48 | 32 | 48 | 32 | 32 | 16 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 48 | 32 | 32 | 16 | 32 | 16 | 16 | 0 |
| 2 | 48 | 64 | 32 | 48 | 32 | 48 | 16 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 48 | 16 | 32 | 16 | 32 | 0 | 16 |
| 3 | 48 | 32 | 64 | 48 | 32 | 16 | 48 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 16 | 48 | 32 | 16 | 0 | 32 | 16 |
| 4 | 32 | 48 | 48 | 64 | 16 | 32 | 32 | 48 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 16 | 32 | 32 | 48 | 0 | 16 | 16 | 32 |
| 5 | 48 | 32 | 32 | 16 | 64 | 48 | 48 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 16 | 16 | 0 | 48 | 32 | 32 | 16 |
| 6 | 32 | 48 | 16 | 32 | 48 | 64 | 32 | 48 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 16 | 32 | 0 | 16 | 32 | 48 | 16 | 32 |
| 7 | 32 | 16 | 48 | 32 | 48 | 32 | 64 | 48 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 16 | 0 | 32 | 16 | 32 | 16 | 48 | 32 |
| 8 | 16 | 32 | 32 | 48 | 32 | 48 | 48 | 64 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 0 | 16 | 16 | 32 | 16 | 32 | 32 | 48 |
| 9 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 64 | 48 | 48 | 32 | 48 | 32 | 32 | 16 | 48 | 32 | 32 | 16 | 32 | 16 | 16 | 0 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 |
| 10 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 48 | 64 | 32 | 48 | 32 | 48 | 16 | 32 | 32 | 48 | 16 | 32 | 16 | 32 | 0 | 16 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 |
| 11 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 48 | 32 | 64 | 48 | 32 | 16 | 48 | 32 | 32 | 16 | 48 | 32 | 16 | 0 | 32 | 16 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 |
| 12 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 48 | 48 | 64 | 16 | 32 | 32 | 48 | 16 | 32 | 32 | 48 | 0 | 16 | 16 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 |
| 13 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 48 | 32 | 32 | 16 | 64 | 48 | 48 | 32 | 32 | 16 | 16 | 0 | 48 | 32 | 32 | 16 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 |
| 14 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 48 | 16 | 32 | 48 | 64 | 32 | 48 | 16 | 32 | 0 | 16 | 32 | 48 | 16 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 |
| 15 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 16 | 48 | 32 | 48 | 32 | 64 | 48 | 16 | 0 | 32 | 16 | 32 | 16 | 48 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 |
| 16 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 16 | 32 | 32 | 48 | 32 | 48 | 48 | 64 | 0 | 16 | 16 | 32 | 16 | 32 | 32 | 48 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 |
| 17 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 48 | 32 | 32 | 16 | 32 | 16 | 16 | 0 | 64 | 48 | 48 | 32 | 48 | 32 | 32 | 16 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 |
| 18 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 48 | 16 | 32 | 16 | 32 | 0 | 16 | 48 | 64 | 32 | 48 | 32 | 48 | 16 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 |
| 19 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 16 | 48 | 32 | 16 | 0 | 32 | 16 | 48 | 32 | 64 | 48 | 32 | 16 | 48 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 |
| 20 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 16 | 32 | 32 | 48 | 0 | 16 | 16 | 32 | 32 | 48 | 48 | 64 | 16 | 32 | 32 | 48 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 |
| 21 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 16 | 16 | 0 | 48 | 32 | 32 | 16 | 48 | 32 | 32 | 16 | 64 | 48 | 48 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 |
| 22 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 16 | 32 | 0 | 16 | 32 | 48 | 16 | 32 | 32 | 48 | 16 | 32 | 48 | 64 | 32 | 48 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 |
| 23 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 16 | 0 | 32 | 16 | 32 | 16 | 48 | 32 | 32 | 16 | 48 | 32 | 48 | 32 | 64 | 48 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 |
| 24 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 0 | 16 | 16 | 32 | 16 | 32 | 32 | 48 | 16 | 32 | 32 | 48 | 32 | 48 | 48 | 64 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 |
| 25 | 48 | 32 | 32 | 16 | 32 | 16 | 16 | 0 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 64 | 48 | 48 | 32 | 48 | 32 | 32 | 16 |
| 26 | 32 | 48 | 16 | 32 | 16 | 32 | 0 | 16 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 48 | 64 | 32 | 48 | 32 | 48 | 16 | 32 |
| 27 | 32 | 16 | 48 | 32 | 16 | 0 | 32 | 16 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 48 | 32 | 64 | 48 | 32 | 16 | 48 | 32 |
| 28 | 16 | 32 | 32 | 48 | 0 | 16 | 16 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 48 | 48 | 64 | 16 | 32 | 32 | 48 |
| 29 | 32 | 16 | 16 | 0 | 48 | 32 | 32 | 16 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 48 | 32 | 32 | 16 | 64 | 48 | 48 | 32 |
| 30 | 16 | 32 | 0 | 16 | 32 | 48 | 16 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 48 | 16 | 32 | 48 | 64 | 32 | 48 |
| 31 | 16 | 0 | 32 | 16 | 32 | 16 | 48 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 16 | 48 | 32 | 48 | 32 | 64 | 48 |
| 32 | 0 | 16 | 16 | 32 | 16 | 32 | 32 | 48 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 16 | 32 | 32 | 48 | 32 | 48 | 48 | 64 |

It is natural such pairs as (1/, 1/), (2/, 2/), (3/, 3/), (4/, 4/), ..., (31/, 31/), (32/, 32/) count 64. It means they are completely similar, since I compared the same unit to itself. If you use this combination, you will surely make your answer wrong against the Def (3). Such pairs as (1/, 32/), (2/, 31/), (3/, 30/), ..., (16/, 17/), (17/, 16/), ... count 0. This means they are completely different. If you use these 'complementary unit' pairs, you will be always wrong against the Def (3).

On top of that I found if you use any pair which counts 16 or 48, you would be always wrong. Only when you use any pair which counts 32, you would possibly be correct.

You should always consult with this reference table, just before you combine any two units, and you should choose only what counts 32.

But you still need the check program for the Def (3) of 'C.E.S.', after combining and calculating under the next equation, before listing out all of your result.

```
Vn= An*32 + Bn*16 + Cn*8 + Dn*4 + En*2 + Fn*1 + 1;
  (n=1, 2, 3, ... ,63, 64: in classical notation)
```

Please read the program list of mine above carefully, and know what I have just intended to do.

You also have to use the inequality conditions complex for your smart listing. One eighth of correct solutions can be listed out finally as the set of 'standard solutions' after eliminating any kind of imitations.

## 4-3. The Result of my recent Calculation.

```
** Composition of 'Complete & Complete' Magic Squares 8x8 **
***     By New Euler's Method of Binary Decompositions     ***
[List of Compositions(Part): Used Units////// Sol_Number]
```

1/ 4/ 6/ 9/12/14/ 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 4 | 62 | 8 | 58 | 5 | 59 |
| 56 | 10 | 53 | 11 | 49 | 15 | 52 | 14 |
| 25 | 39 | 28 | 38 | 32 | 34 | 29 | 35 |
| 48 | 18 | 45 | 19 | 41 | 23 | 44 | 22 |
| 57 | 7 | 60 | 6 | 64 | 2 | 61 | 3 |
| 16 | 50 | 13 | 51 | 9 | 55 | 12 | 54 |
| 33 | 31 | 36 | 30 | 40 | 26 | 37 | 27 |
| 24 | 42 | 21 | 43 | 17 | 47 | 20 | 46 |

1/ 4/ 7/ 9/12/14/ 385

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 4 | 62 | 8 | 58 | 5 | 59 |
| 56 | 10 | 53 | 11 | 49 | 15 | 52 | 14 |
| 17 | 47 | 20 | 46 | 24 | 42 | 21 | 43 |
| 40 | 26 | 37 | 27 | 33 | 31 | 36 | 30 |
| 57 | 7 | 60 | 6 | 64 | 2 | 61 | 3 |
| 16 | 50 | 13 | 51 | 9 | 55 | 12 | 54 |
| 41 | 23 | 44 | 22 | 48 | 18 | 45 | 19 |
| 32 | 34 | 29 | 35 | 25 | 39 | 28 | 38 |

1/ 4/ 9/ 6/12/14/ 769

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 4 | 62 | 12 | 54 | 9 | 55 |
| 60 | 6 | 57 | 7 | 49 | 15 | 52 | 14 |
| 21 | 43 | 24 | 42 | 32 | 34 | 29 | 35 |
| 48 | 18 | 45 | 19 | 37 | 27 | 40 | 26 |
| 53 | 11 | 56 | 10 | 64 | 2 | 61 | 3 |
| 16 | 50 | 13 | 51 | 5 | 59 | 8 | 58 |
| 33 | 31 | 36 | 30 | 44 | 22 | 41 | 23 |
| 28 | 38 | 25 | 39 | 17 | 47 | 20 | 46 |

1/ 4/10/ 6/11/13/ 913

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 9 | 62 | 12 | 54 | 4 | 55 |
| 60 | 6 | 52 | 7 | 49 | 15 | 57 | 14 |
| 21 | 43 | 29 | 42 | 32 | 34 | 24 | 35 |
| 48 | 18 | 40 | 19 | 37 | 27 | 45 | 26 |
| 53 | 11 | 61 | 10 | 64 | 2 | 56 | 3 |
| 16 | 50 | 8 | 51 | 5 | 59 | 13 | 58 |
| 33 | 31 | 41 | 30 | 44 | 22 | 36 | 23 |
| 28 | 38 | 20 | 39 | 17 | 47 | 25 | 46 |

1/ 4/11/ 6/10/13/ 1057

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 3 | 56 | 12 | 54 | 10 | 61 |
| 60 | 6 | 58 | 13 | 49 | 15 | 51 | 8 |
| 21 | 43 | 23 | 36 | 32 | 34 | 30 | 41 |
| 48 | 18 | 46 | 25 | 37 | 27 | 39 | 20 |
| 53 | 11 | 55 | 4 | 64 | 2 | 62 | 9 |
| 16 | 50 | 14 | 57 | 5 | 59 | 7 | 52 |
| 33 | 31 | 35 | 24 | 44 | 22 | 42 | 29 |
| 28 | 38 | 26 | 45 | 17 | 47 | 19 | 40 |

1/ 4/12/ 6/ 9/14/ 1201

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 10 | 56 | 12 | 54 | 3 | 61 |
| 60 | 6 | 51 | 13 | 49 | 15 | 58 | 8 |
| 21 | 43 | 30 | 36 | 32 | 34 | 23 | 41 |
| 48 | 18 | 39 | 25 | 37 | 27 | 46 | 20 |
| 53 | 11 | 62 | 4 | 64 | 2 | 55 | 9 |
| 16 | 50 | 7 | 57 | 5 | 59 | 14 | 52 |
| 33 | 31 | 42 | 24 | 44 | 22 | 35 | 29 |
| 28 | 38 | 19 | 45 | 17 | 47 | 26 | 40 |

1/ 4/17/ 6/10/11/ 1345

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 9 | 64 | 3 | 63 | 4 | 53 | 10 | 54 |
| 52 | 5 | 58 | 6 | 57 | 16 | 51 | 15 |
| 29 | 44 | 23 | 43 | 24 | 33 | 30 | 34 |
| 40 | 17 | 46 | 18 | 45 | 28 | 39 | 27 |
| 61 | 12 | 55 | 11 | 56 | 1 | 62 | 2 |
| 8 | 49 | 14 | 50 | 13 | 60 | 7 | 59 |
| 41 | 32 | 35 | 31 | 36 | 21 | 42 | 22 |
| 20 | 37 | 26 | 38 | 25 | 48 | 19 | 47 |

1/ 4/18/ 6/ 9/12/ 1633

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 9 | 64 | 10 | 63 | 4 | 53 | 3 | 54 |
| 52 | 5 | 51 | 6 | 57 | 16 | 58 | 15 |
| 29 | 44 | 30 | 43 | 24 | 33 | 23 | 34 |
| 40 | 17 | 39 | 18 | 45 | 28 | 46 | 27 |
| 61 | 12 | 62 | 11 | 56 | 1 | 55 | 2 |
| 8 | 49 | 7 | 50 | 13 | 60 | 14 | 59 |
| 41 | 32 | 42 | 31 | 36 | 21 | 35 | 22 |
| 20 | 37 | 19 | 38 | 25 | 48 | 26 | 47 |

1/ 4/19/ 6/ 9/12/ 1921

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 9 | 64 | 2 | 55 | 4 | 53 | 11 | 62 |
| 52 | 5 | 59 | 14 | 57 | 16 | 50 | 7 |
| 29 | 44 | 22 | 35 | 24 | 33 | 31 | 42 |
| 40 | 17 | 47 | 26 | 45 | 28 | 38 | 19 |
| 61 | 12 | 54 | 3 | 56 | 1 | 63 | 10 |
| 8 | 49 | 15 | 58 | 13 | 60 | 6 | 51 |
| 41 | 32 | 34 | 23 | 36 | 21 | 43 | 30 |
| 20 | 37 | 27 | 46 | 25 | 48 | 18 | 39 |

1/ 4/20/ 6/10/11/ 2209

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 9 | 64 | 11 | 55 | 4 | 53 | 2 | 62 |
| 52 | 5 | 50 | 14 | 57 | 16 | 59 | 7 |
| 29 | 44 | 31 | 35 | 24 | 33 | 22 | 42 |
| 40 | 17 | 38 | 26 | 45 | 28 | 47 | 19 |
| 61 | 12 | 63 | 3 | 56 | 1 | 54 | 10 |
| 8 | 49 | 6 | 58 | 13 | 60 | 15 | 51 |
| 41 | 32 | 43 | 23 | 36 | 21 | 34 | 30 |
| 20 | 37 | 18 | 46 | 25 | 48 | 27 | 39 |

1/ 4/21/ 6/ 9/14/ 2497

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 9 | 55 | 2 | 64 | 4 | 62 | 11 | 53 |
| 52 | 14 | 59 | 5 | 57 | 7 | 50 | 16 |
| 29 | 35 | 22 | 44 | 24 | 42 | 31 | 33 |
| 40 | 26 | 47 | 17 | 45 | 19 | 38 | 28 |
| 61 | 3 | 54 | 12 | 56 | 10 | 63 | 1 |
| 8 | 58 | 15 | 49 | 13 | 51 | 6 | 60 |
| 41 | 23 | 34 | 32 | 36 | 30 | 43 | 21 |
| 20 | 46 | 27 | 37 | 25 | 39 | 18 | 48 |

1/ 4/22/ 6/10/13/ 2641

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 9 | 55 | 11 | 64 | 4 | 62 | 2 | 53 |
| 52 | 14 | 50 | 5 | 57 | 7 | 59 | 16 |
| 29 | 35 | 31 | 44 | 24 | 42 | 22 | 33 |
| 40 | 26 | 38 | 17 | 45 | 19 | 47 | 28 |
| 61 | 3 | 63 | 12 | 56 | 10 | 54 | 1 |
| 8 | 58 | 6 | 49 | 13 | 51 | 15 | 60 |
| 41 | 23 | 43 | 32 | 36 | 30 | 34 | 21 |
| 20 | 46 | 18 | 37 | 25 | 39 | 27 | 48 |

1/ 4/23/ 6/11/13/ 2785

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 9 | 55 | 1 | 54 | 4 | 62 | 12 | 63 |
| 52 | 14 | 60 | 15 | 57 | 7 | 49 | 6 |
| 29 | 35 | 21 | 34 | 24 | 42 | 32 | 43 |
| 40 | 26 | 48 | 27 | 45 | 19 | 37 | 18 |
| 61 | 3 | 53 | 2 | 56 | 10 | 64 | 11 |
| 8 | 58 | 16 | 59 | 13 | 51 | 5 | 50 |
| 41 | 23 | 33 | 22 | 36 | 30 | 44 | 31 |
| 20 | 46 | 28 | 47 | 25 | 39 | 17 | 38 |

1/ 4/24/ 6/12/14/ 2929

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 9 | 55 | 12 | 54 | 4 | 62 | 1 | 63 |
| 52 | 14 | 49 | 15 | 57 | 7 | 60 | 6 |
| 29 | 35 | 32 | 34 | 24 | 42 | 21 | 43 |
| 40 | 26 | 37 | 27 | 45 | 19 | 48 | 18 |
| 61 | 3 | 64 | 2 | 56 | 10 | 53 | 11 |
| 8 | 58 | 5 | 59 | 13 | 51 | 16 | 50 |
| 41 | 23 | 44 | 22 | 36 | 30 | 33 | 31 |
| 20 | 46 | 17 | 47 | 25 | 39 | 28 | 38 |

1/ 6/ 4/ 9/12/14/ 3073

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 4 | 62 | 8 | 58 | 5 | 59 |
| 48 | 18 | 45 | 19 | 41 | 23 | 44 | 22 |
| 25 | 39 | 28 | 38 | 32 | 34 | 29 | 35 |
| 56 | 10 | 53 | 11 | 49 | 15 | 52 | 14 |
| 57 | 7 | 60 | 6 | 64 | 2 | 61 | 3 |
| 24 | 42 | 21 | 43 | 17 | 47 | 20 | 46 |
| 33 | 31 | 36 | 30 | 40 | 26 | 37 | 27 |
| 16 | 50 | 13 | 51 | 9 | 55 | 12 | 54 |

1/ 6/ 7/ 9/12/14/ 3457

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 4 | 62 | 8 | 58 | 5 | 59 |
| 40 | 26 | 37 | 27 | 33 | 31 | 36 | 30 |
| 17 | 47 | 20 | 46 | 24 | 42 | 21 | 43 |
| 56 | 10 | 53 | 11 | 49 | 15 | 52 | 14 |
| 57 | 7 | 60 | 6 | 64 | 2 | 61 | 3 |
| 32 | 34 | 29 | 35 | 25 | 39 | 28 | 38 |
| 41 | 23 | 44 | 22 | 48 | 18 | 45 | 19 |
| 16 | 50 | 13 | 51 | 9 | 55 | 12 | 54 |

1/ 6/ 9/ 4/12/14/ 3841

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 4 | 62 | 12 | 54 | 9 | 55 |
| 48 | 18 | 45 | 19 | 37 | 27 | 40 | 26 |
| 21 | 43 | 24 | 42 | 32 | 34 | 29 | 35 |
| 60 | 6 | 57 | 7 | 49 | 15 | 52 | 14 |
| 53 | 11 | 56 | 10 | 64 | 2 | 61 | 3 |
| 28 | 38 | 25 | 39 | 17 | 47 | 20 | 46 |
| 33 | 31 | 36 | 30 | 44 | 22 | 41 | 23 |
| 16 | 50 | 13 | 51 | 5 | 59 | 8 | 58 |

1/ 6/10/ 4/11/13/ 4129

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 9 | 62 | 12 | 54 | 4 | 55 |
| 48 | 18 | 40 | 19 | 37 | 27 | 45 | 26 |
| 21 | 43 | 29 | 42 | 32 | 34 | 24 | 35 |
| 60 | 6 | 52 | 7 | 49 | 15 | 57 | 14 |
| 53 | 11 | 61 | 10 | 64 | 2 | 56 | 3 |
| 28 | 38 | 20 | 39 | 17 | 47 | 25 | 46 |
| 33 | 31 | 41 | 30 | 44 | 22 | 36 | 23 |
| 16 | 50 | 8 | 51 | 5 | 59 | 13 | 58 |

1/ 6/11/ 4/10/13/ 4417

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 3 | 56 | 12 | 54 | 10 | 61 |
| 48 | 18 | 46 | 25 | 37 | 27 | 39 | 20 |
| 21 | 43 | 23 | 36 | 32 | 34 | 30 | 41 |
| 60 | 6 | 58 | 13 | 49 | 15 | 51 | 8 |
| 53 | 11 | 55 | 4 | 64 | 2 | 62 | 9 |
| 28 | 38 | 26 | 45 | 17 | 47 | 19 | 40 |
| 33 | 31 | 35 | 24 | 44 | 22 | 42 | 29 |
| 16 | 50 | 14 | 57 | 5 | 59 | 7 | 52 |

1/ 6/12/ 4/ 9/14/ 4705

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 10 | 56 | 12 | 54 | 3 | 61 |
| 48 | 18 | 39 | 25 | 37 | 27 | 46 | 20 |
| 21 | 43 | 30 | 36 | 32 | 34 | 23 | 41 |
| 60 | 6 | 51 | 13 | 49 | 15 | 58 | 8 |
| 53 | 11 | 62 | 4 | 64 | 2 | 55 | 9 |
| 28 | 38 | 19 | 45 | 17 | 47 | 26 | 40 |
| 33 | 31 | 42 | 24 | 44 | 22 | 35 | 29 |
| 16 | 50 | 7 | 57 | 5 | 59 | 14 | 52 |

1/ 6/13/ 4/10/11/ 4993

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 56 | 3 | 63 | 12 | 61 | 10 | 54 |
| 48 | 25 | 46 | 18 | 37 | 20 | 39 | 27 |
| 21 | 36 | 23 | 43 | 32 | 41 | 30 | 34 |
| 60 | 13 | 58 | 6 | 49 | 8 | 51 | 15 |
| 53 | 4 | 55 | 11 | 64 | 9 | 62 | 2 |
| 28 | 45 | 26 | 38 | 17 | 40 | 19 | 47 |
| 33 | 24 | 35 | 31 | 44 | 29 | 42 | 22 |
| 16 | 57 | 14 | 50 | 5 | 52 | 7 | 59 |

1/ 6/14/ 4/ 9/12/ 5281

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 56 | 10 | 63 | 12 | 61 | 3 | 54 |
| 48 | 25 | 39 | 18 | 37 | 20 | 46 | 27 |
| 21 | 36 | 30 | 43 | 32 | 41 | 23 | 34 |
| 60 | 13 | 51 | 6 | 49 | 8 | 58 | 15 |
| 53 | 4 | 62 | 11 | 64 | 9 | 55 | 2 |
| 28 | 45 | 19 | 38 | 17 | 40 | 26 | 47 |
| 33 | 24 | 42 | 31 | 44 | 29 | 35 | 22 |
| 16 | 57 | 7 | 50 | 5 | 52 | 14 | 59 |

1/ 6/15/ 4/ 9/12/ 5569

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 56 | 2 | 55 | 12 | 61 | 11 | 62 |
| 48 | 25 | 47 | 26 | 37 | 20 | 38 | 19 |
| 21 | 36 | 22 | 35 | 32 | 41 | 31 | 42 |
| 60 | 13 | 59 | 14 | 49 | 8 | 50 | 7 |
| 53 | 4 | 54 | 3 | 64 | 9 | 63 | 10 |
| 28 | 45 | 27 | 46 | 17 | 40 | 18 | 39 |
| 33 | 24 | 34 | 23 | 44 | 29 | 43 | 30 |
| 16 | 57 | 15 | 58 | 5 | 52 | 6 | 51 |

1/ 6/16/ 4/10/11/ 5857

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 56 | 11 | 55 | 12 | 61 | 2 | 62 |
| 48 | 25 | 38 | 26 | 37 | 20 | 47 | 19 |
| 21 | 36 | 31 | 35 | 32 | 41 | 22 | 42 |
| 60 | 13 | 50 | 14 | 49 | 8 | 59 | 7 |
| 53 | 4 | 63 | 3 | 64 | 9 | 54 | 10 |
| 28 | 45 | 18 | 46 | 17 | 40 | 27 | 39 |
| 33 | 24 | 43 | 23 | 44 | 29 | 34 | 30 |
| 16 | 57 | 6 | 58 | 5 | 52 | 15 | 51 |

1/ 7/ 4/ 9/12/14/ 6145

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 4 | 62 | 8 | 58 | 5 | 59 |
| 48 | 18 | 45 | 19 | 41 | 23 | 44 | 22 |
| 9 | 55 | 12 | 54 | 16 | 50 | 13 | 51 |
| 40 | 26 | 37 | 27 | 33 | 31 | 36 | 30 |
| 57 | 7 | 60 | 6 | 64 | 2 | 61 | 3 |
| 24 | 42 | 21 | 43 | 17 | 47 | 20 | 46 |
| 49 | 15 | 52 | 14 | 56 | 10 | 53 | 11 |
| 32 | 34 | 29 | 35 | 25 | 39 | 28 | 38 |

1/ 7/ 6/ 9/12/14/ 6529

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 4 | 62 | 8 | 58 | 5 | 59 |
| 40 | 26 | 37 | 27 | 33 | 31 | 36 | 30 |
| 9 | 55 | 12 | 54 | 16 | 50 | 13 | 51 |
| 48 | 18 | 45 | 19 | 41 | 23 | 44 | 22 |
| 57 | 7 | 60 | 6 | 64 | 2 | 61 | 3 |
| 32 | 34 | 29 | 35 | 25 | 39 | 28 | 38 |
| 49 | 15 | 52 | 14 | 56 | 10 | 53 | 11 |
| 24 | 42 | 21 | 43 | 17 | 47 | 20 | 46 |

1/ 7/ 9/ 4/12/14/ 6913

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 4 | 62 | 12 | 54 | 9 | 55 |
| 48 | 18 | 45 | 19 | 37 | 27 | 40 | 26 |
| 5 | 59 | 8 | 58 | 16 | 50 | 13 | 51 |
| 44 | 22 | 41 | 23 | 33 | 31 | 36 | 30 |
| 53 | 11 | 56 | 10 | 64 | 2 | 61 | 3 |
| 28 | 38 | 25 | 39 | 17 | 47 | 20 | 46 |
| 49 | 15 | 52 | 14 | 60 | 6 | 57 | 7 |
| 32 | 34 | 29 | 35 | 21 | 43 | 24 | 42 |

1/ 7/10/ 4/11/13/ 7201

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 9 | 62 | 12 | 54 | 4 | 55 |
| 48 | 18 | 40 | 19 | 37 | 27 | 45 | 26 |
| 5 | 59 | 13 | 58 | 16 | 50 | 8 | 51 |
| 44 | 22 | 36 | 23 | 33 | 31 | 41 | 30 |
| 53 | 11 | 61 | 10 | 64 | 2 | 56 | 3 |
| 28 | 38 | 20 | 39 | 17 | 47 | 25 | 46 |
| 49 | 15 | 57 | 14 | 60 | 6 | 52 | 7 |
| 32 | 34 | 24 | 35 | 21 | 43 | 29 | 42 |

1/ 7/11/ 4/10/13/ 7489

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 3 | 56 | 12 | 54 | 10 | 61 |
| 48 | 18 | 46 | 25 | 37 | 27 | 39 | 20 |
| 5 | 59 | 7 | 52 | 16 | 50 | 14 | 57 |
| 44 | 22 | 42 | 29 | 33 | 31 | 35 | 24 |
| 53 | 11 | 55 | 4 | 64 | 2 | 62 | 9 |
| 28 | 38 | 26 | 45 | 17 | 47 | 19 | 40 |
| 49 | 15 | 51 | 8 | 60 | 6 | 58 | 13 |
| 32 | 34 | 30 | 41 | 21 | 43 | 23 | 36 |

1/ 7/12/ 4/ 9/14/ 7777

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 10 | 56 | 12 | 54 | 3 | 61 |
| 48 | 18 | 39 | 25 | 37 | 27 | 46 | 20 |
| 5 | 59 | 14 | 52 | 16 | 50 | 7 | 57 |
| 44 | 22 | 35 | 29 | 33 | 31 | 42 | 24 |
| 53 | 11 | 62 | 4 | 64 | 2 | 55 | 9 |
| 28 | 38 | 19 | 45 | 17 | 47 | 26 | 40 |
| 49 | 15 | 58 | 8 | 60 | 6 | 51 | 13 |
| 32 | 34 | 23 | 41 | 21 | 43 | 30 | 36 |

1/ 7/13/ 4/10/11/ 8065

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 56 | 3 | 63 | 12 | 61 | 10 | 54 |
| 48 | 25 | 46 | 18 | 37 | 20 | 39 | 27 |
| 5 | 52 | 7 | 59 | 16 | 57 | 14 | 50 |
| 44 | 29 | 42 | 22 | 33 | 24 | 35 | 31 |
| 53 | 4 | 55 | 11 | 64 | 9 | 62 | 2 |
| 28 | 45 | 26 | 38 | 17 | 40 | 19 | 47 |
| 49 | 8 | 51 | 15 | 60 | 13 | 58 | 6 |
| 32 | 41 | 30 | 34 | 21 | 36 | 23 | 43 |

1/ 7/14/ 4/ 9/12/ 8353

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 56 | 10 | 63 | 12 | 61 | 3 | 54 |
| 48 | 25 | 39 | 18 | 37 | 20 | 46 | 27 |
| 5 | 52 | 14 | 59 | 16 | 57 | 7 | 50 |
| 44 | 29 | 35 | 22 | 33 | 24 | 42 | 31 |
| 53 | 4 | 62 | 11 | 64 | 9 | 55 | 2 |
| 28 | 45 | 19 | 38 | 17 | 40 | 26 | 47 |
| 49 | 8 | 58 | 15 | 60 | 13 | 51 | 6 |
| 32 | 41 | 23 | 34 | 21 | 36 | 30 | 43 |

1/ 7/15/ 4/ 9/12/ 8641

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 56 | 2 | 55 | 12 | 61 | 11 | 62 |
| 48 | 25 | 47 | 26 | 37 | 20 | 38 | 19 |
| 5 | 52 | 6 | 51 | 16 | 57 | 15 | 58 |
| 44 | 29 | 43 | 30 | 33 | 24 | 34 | 23 |
| 53 | 4 | 54 | 3 | 64 | 9 | 63 | 10 |
| 28 | 45 | 27 | 46 | 17 | 40 | 18 | 39 |
| 49 | 8 | 50 | 7 | 60 | 13 | 59 | 14 |
| 32 | 41 | 31 | 42 | 21 | 36 | 22 | 35 |

1/ 7/16/ 4/10/11/ 8929

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 56 | 11 | 55 | 12 | 61 | 2 | 62 |
| 48 | 25 | 38 | 26 | 37 | 20 | 47 | 19 |
| 5 | 52 | 15 | 51 | 16 | 57 | 6 | 58 |
| 44 | 29 | 34 | 30 | 33 | 24 | 43 | 23 |
| 53 | 4 | 63 | 3 | 64 | 9 | 54 | 10 |
| 28 | 45 | 18 | 46 | 17 | 40 | 27 | 39 |
| 49 | 8 | 59 | 7 | 60 | 13 | 50 | 14 |
| 32 | 41 | 22 | 42 | 21 | 36 | 31 | 35 |

1/ 7/17/ 4/10/11/ 9217

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 9 | 64 | 3 | 63 | 4 | 53 | 10 | 54 |
| 40 | 17 | 46 | 18 | 45 | 28 | 39 | 27 |
| 13 | 60 | 7 | 59 | 8 | 49 | 14 | 50 |
| 36 | 21 | 42 | 22 | 41 | 32 | 35 | 31 |
| 61 | 12 | 55 | 11 | 56 | 1 | 62 | 2 |
| 20 | 37 | 26 | 38 | 25 | 48 | 19 | 47 |
| 57 | 16 | 51 | 15 | 52 | 5 | 58 | 6 |
| 24 | 33 | 30 | 34 | 29 | 44 | 23 | 43 |

1/ 7/18/ 4/ 9/12/ 9505

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 9 | 64 | 10 | 63 | 4 | 53 | 3 | 54 |
| 40 | 17 | 39 | 18 | 45 | 28 | 46 | 27 |
| 13 | 60 | 14 | 59 | 8 | 49 | 7 | 50 |
| 36 | 21 | 35 | 22 | 41 | 32 | 42 | 31 |
| 61 | 12 | 62 | 11 | 56 | 1 | 55 | 2 |
| 20 | 37 | 19 | 38 | 25 | 48 | 26 | 47 |
| 57 | 16 | 58 | 15 | 52 | 5 | 51 | 6 |
| 24 | 33 | 23 | 34 | 29 | 44 | 30 | 43 |

1/ 7/19/ 4/ 9/12/ 9793

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 9 | 64 | 2 | 55 | 4 | 53 | 11 | 62 |
| 40 | 17 | 47 | 26 | 45 | 28 | 38 | 19 |
| 13 | 60 | 6 | 51 | 8 | 49 | 15 | 58 |
| 36 | 21 | 43 | 30 | 41 | 32 | 34 | 23 |
| 61 | 12 | 54 | 3 | 56 | 1 | 63 | 10 |
| 20 | 37 | 27 | 46 | 25 | 48 | 18 | 39 |
| 57 | 16 | 50 | 7 | 52 | 5 | 59 | 14 |
| 24 | 33 | 31 | 42 | 29 | 44 | 22 | 35 |

1/ 7/20/ 4/10/11/ 10081

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 9 | 64 | 11 | 55 | 4 | 53 | 2 | 62 |
| 40 | 17 | 38 | 26 | 45 | 28 | 47 | 19 |
| 13 | 60 | 15 | 51 | 8 | 49 | 6 | 58 |
| 36 | 21 | 34 | 30 | 41 | 32 | 43 | 23 |
| 61 | 12 | 63 | 3 | 56 | 1 | 54 | 10 |
| 20 | 37 | 18 | 46 | 25 | 48 | 27 | 39 |
| 57 | 16 | 59 | 7 | 52 | 5 | 50 | 14 |
| 24 | 33 | 22 | 42 | 29 | 44 | 31 | 35 |

1/ 7/21/ 4/ 9/14/ 10369

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 9 | 55 | 2 | 64 | 4 | 62 | 11 | 53 |
| 40 | 26 | 47 | 17 | 45 | 19 | 38 | 28 |
| 13 | 51 | 6 | 60 | 8 | 58 | 15 | 49 |
| 36 | 30 | 43 | 21 | 41 | 23 | 34 | 32 |
| 61 | 3 | 54 | 12 | 56 | 10 | 63 | 1 |
| 20 | 46 | 27 | 37 | 25 | 39 | 18 | 48 |
| 57 | 7 | 50 | 16 | 52 | 14 | 59 | 5 |
| 24 | 42 | 31 | 33 | 29 | 35 | 22 | 44 |

1/ 7/22/ 4/10/13/ 10657

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 9 | 55 | 11 | 64 | 4 | 62 | 2 | 53 |
| 40 | 26 | 38 | 17 | 45 | 19 | 47 | 28 |
| 13 | 51 | 15 | 60 | 8 | 58 | 6 | 49 |
| 36 | 30 | 34 | 21 | 41 | 23 | 43 | 32 |
| 61 | 3 | 63 | 12 | 56 | 10 | 54 | 1 |
| 20 | 46 | 18 | 37 | 25 | 39 | 27 | 48 |
| 57 | 7 | 59 | 16 | 52 | 14 | 50 | 5 |
| 24 | 42 | 22 | 33 | 29 | 35 | 31 | 44 |

1/ 7/23/ 4/11/13/ 10945

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 9 | 55 | 1 | 54 | 4 | 62 | 12 | 63 |
| 40 | 26 | 48 | 27 | 45 | 19 | 37 | 18 |
| 13 | 51 | 5 | 50 | 8 | 58 | 16 | 59 |
| 36 | 30 | 44 | 31 | 41 | 23 | 33 | 22 |
| 61 | 3 | 53 | 2 | 56 | 10 | 64 | 11 |
| 20 | 46 | 28 | 47 | 25 | 39 | 17 | 38 |
| 57 | 7 | 49 | 6 | 52 | 14 | 60 | 15 |
| 24 | 42 | 32 | 43 | 29 | 35 | 21 | 34 |

1/ 7/24/ 4/12/14/ 11233

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 9 | 55 | 12 | 54 | 4 | 62 | 1 | 63 |
| 40 | 26 | 37 | 27 | 45 | 19 | 48 | 18 |
| 13 | 51 | 16 | 50 | 8 | 58 | 5 | 59 |
| 36 | 30 | 33 | 31 | 41 | 23 | 44 | 22 |
| 61 | 3 | 64 | 2 | 56 | 10 | 53 | 11 |
| 20 | 46 | 17 | 47 | 25 | 39 | 28 | 38 |
| 57 | 7 | 60 | 6 | 52 | 14 | 49 | 15 |
| 24 | 42 | 21 | 43 | 29 | 35 | 32 | 34 |

1/ 9/ 4/ 6/12/14/ 12289

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 4 | 62 | 20 | 46 | 17 | 47 |
| 60 | 6 | 57 | 7 | 41 | 23 | 44 | 22 |
| 13 | 51 | 16 | 50 | 32 | 34 | 29 | 35 |
| 56 | 10 | 53 | 11 | 37 | 27 | 40 | 26 |
| 45 | 19 | 48 | 18 | 64 | 2 | 61 | 3 |
| 24 | 42 | 21 | 43 | 5 | 59 | 8 | 58 |
| 33 | 31 | 36 | 30 | 52 | 14 | 49 | 15 |
| 28 | 38 | 25 | 39 | 9 | 55 | 12 | 54 |

1/10/ 4/ 6/11/13/ 14017

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|---|---|---|---|---|---|---|---|
| 1 | 63 | 17 | 62 | 20 | 46 | 4 | 47 |
| 60 | 6 | 44 | 7 | 41 | 23 | 57 | 22 |
| 13 | 51 | 29 | 50 | 32 | 34 | 16 | 35 |
| 56 | 10 | 40 | 11 | 37 | 27 | 53 | 26 |
| 45 | 19 | 61 | 18 | 64 | 2 | 48 | 3 |
| 24 | 42 | 8 | 43 | 5 | 59 | 21 | 58 |
| 33 | 31 | 49 | 30 | 52 | 14 | 36 | 15 |
| 28 | 38 | 12 | 39 | 9 | 55 | 25 | 54 |

1/11/ 4/ 6/10/13/ 15745

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|---|---|---|---|---|---|---|---|
| 1 | 63 | 3 | 48 | 20 | 46 | 18 | 61 |
| 60 | 6 | 58 | 21 | 41 | 23 | 43 | 8 |
| 13 | 51 | 15 | 36 | 32 | 34 | 30 | 49 |
| 56 | 10 | 54 | 25 | 37 | 27 | 39 | 12 |
| 45 | 19 | 47 | 4 | 64 | 2 | 62 | 17 |
| 24 | 42 | 22 | 57 | 5 | 59 | 7 | 44 |
| 33 | 31 | 35 | 16 | 52 | 14 | 50 | 29 |
| 28 | 38 | 26 | 53 | 9 | 55 | 11 | 40 |

1/12/ 4/ 6/ 9/14/ 17473

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 18 | 48 | 20 | 46 | 3 | 61 |
| 60 | 6 | 43 | 21 | 41 | 23 | 58 | 8 |
| 13 | 51 | 30 | 36 | 32 | 34 | 15 | 49 |
| 56 | 10 | 39 | 25 | 37 | 27 | 54 | 12 |
| 45 | 19 | 62 | 4 | 64 | 2 | 47 | 17 |
| 24 | 42 | 7 | 57 | 5 | 59 | 22 | 44 |
| 33 | 31 | 50 | 16 | 52 | 14 | 35 | 29 |
| 28 | 38 | 11 | 53 | 9 | 55 | 26 | 40 |

2/ 3/ 5/ 9/12/14/ 19201

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 4 | 62 | 8 | 58 | 5 | 59 |
| 56 | 10 | 53 | 11 | 49 | 15 | 52 | 14 |
| 33 | 31 | 36 | 30 | 40 | 26 | 37 | 27 |
| 48 | 18 | 45 | 19 | 41 | 23 | 44 | 22 |
| 57 | 7 | 60 | 6 | 64 | 2 | 61 | 3 |
| 16 | 50 | 13 | 51 | 9 | 55 | 12 | 54 |
| 25 | 39 | 28 | 38 | 32 | 34 | 29 | 35 |
| 24 | 42 | 21 | 43 | 17 | 47 | 20 | 46 |

2/ 5/ 3/ 9/12/14/ 22273

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 4 | 62 | 8 | 58 | 5 | 59 |
| 48 | 18 | 45 | 19 | 41 | 23 | 44 | 22 |
| 33 | 31 | 36 | 30 | 40 | 26 | 37 | 27 |
| 56 | 10 | 53 | 11 | 49 | 15 | 52 | 14 |
| 57 | 7 | 60 | 6 | 64 | 2 | 61 | 3 |
| 24 | 42 | 21 | 43 | 17 | 47 | 20 | 46 |
| 25 | 39 | 28 | 38 | 32 | 34 | 29 | 35 |
| 16 | 50 | 13 | 51 | 9 | 55 | 12 | 54 |

2/ 8/ 3/ 9/12/14/ 25345

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|---|---|---|---|---|---|---|---|
| 1 | 63 | 4 | 62 | 8 | 58 | 5 | 59 |
| 48 | 18 | 45 | 19 | 41 | 23 | 44 | 22 |
| 49 | 15 | 52 | 14 | 56 | 10 | 53 | 11 |
| 40 | 26 | 37 | 27 | 33 | 31 | 36 | 30 |
| 57 | 7 | 60 | 6 | 64 | 2 | 61 | 3 |
| 24 | 42 | 21 | 43 | 17 | 47 | 20 | 46 |
| 9 | 55 | 12 | 54 | 16 | 50 | 13 | 51 |
| 32 | 34 | 29 | 35 | 25 | 39 | 28 | 38 |

2/ 9/ 3/ 5/12/14/ 31489

| | | | | | | | |
|---|---|---|---|---|---|---|---|
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| 60 | 6 | 57 | 7 | 41 | 23 | 44 | 22 |
| 33 | 31 | 36 | 30 | 52 | 14 | 49 | 15 |
| 56 | 10 | 53 | 11 | 37 | 27 | 40 | 26 |
| 45 | 19 | 48 | 18 | 64 | 2 | 61 | 3 |
| 24 | 42 | 21 | 43 | 5 | 59 | 8 | 58 |
| 13 | 51 | 16 | 50 | 32 | 34 | 29 | 35 |
| 28 | 38 | 25 | 39 | 9 | 55 | 12 | 54 |

2/10/ 3/ 5/11/13/ 33217

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 17 | 62 | 20 | 46 | 4 | 47 |
| 60 | 6 | 44 | 7 | 41 | 23 | 57 | 22 |
| 33 | 31 | 49 | 30 | 52 | 14 | 36 | 15 |
| 56 | 10 | 40 | 11 | 37 | 27 | 53 | 26 |
| 45 | 19 | 61 | 18 | 64 | 2 | 48 | 3 |
| 24 | 42 | 8 | 43 | 5 | 59 | 21 | 58 |
| 13 | 51 | 29 | 50 | 32 | 34 | 16 | 35 |
| 28 | 38 | 12 | 39 | 9 | 55 | 25 | 54 |

2/11/ 3/ 5/10/13/ 34945

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 3 | 48 | 20 | 46 | 18 | 61 |
| 60 | 6 | 58 | 21 | 41 | 23 | 43 | 8 |
| 33 | 31 | 35 | 16 | 52 | 14 | 50 | 29 |
| 56 | 10 | 54 | 25 | 37 | 27 | 39 | 12 |
| 45 | 19 | 47 | 4 | 64 | 2 | 62 | 17 |
| 24 | 42 | 22 | 57 | 5 | 59 | 7 | 44 |
| 13 | 51 | 15 | 36 | 32 | 34 | 30 | 49 |
| 28 | 38 | 26 | 53 | 9 | 55 | 11 | 40 |

2/12/ 3/ 5/ 9/14/ 36673

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 18 | 48 | 20 | 46 | 3 | 61 |
| 60 | 6 | 43 | 21 | 41 | 23 | 58 | 8 |
| 33 | 31 | 50 | 16 | 52 | 14 | 35 | 29 |
| 56 | 10 | 39 | 25 | 37 | 27 | 54 | 12 |
| 45 | 19 | 62 | 4 | 64 | 2 | 47 | 17 |
| 24 | 42 | 7 | 57 | 5 | 59 | 22 | 44 |
| 13 | 51 | 30 | 36 | 32 | 34 | 15 | 49 |
| 28 | 38 | 11 | 53 | 9 | 55 | 26 | 40 |

3/ 2/ 5/ 9/12/14/ 38401

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 4 | 62 | 8 | 58 | 5 | 59 |
| 56 | 10 | 53 | 11 | 49 | 15 | 52 | 14 |
| 17 | 47 | 20 | 46 | 24 | 42 | 21 | 43 |
| 32 | 34 | 29 | 35 | 25 | 39 | 28 | 38 |
| 57 | 7 | 60 | 6 | 64 | 2 | 61 | 3 |
| 16 | 50 | 13 | 51 | 9 | 55 | 12 | 54 |
| 41 | 23 | 44 | 22 | 48 | 18 | 45 | 19 |
| 40 | 26 | 37 | 27 | 33 | 31 | 36 | 30 |

3/ 5/ 2/ 9/12/14/ 41473

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 4 | 62 | 8 | 58 | 5 | 59 |
| 48 | 18 | 45 | 19 | 41 | 23 | 44 | 22 |
| 9 | 55 | 12 | 54 | 16 | 50 | 13 | 51 |
| 32 | 34 | 29 | 35 | 25 | 39 | 28 | 38 |
| 57 | 7 | 60 | 6 | 64 | 2 | 61 | 3 |
| 24 | 42 | 21 | 43 | 17 | 47 | 20 | 46 |
| 49 | 15 | 52 | 14 | 56 | 10 | 53 | 11 |
| 40 | 26 | 37 | 27 | 33 | 31 | 36 | 30 |

3/ 8/ 2/ 9/12/14/ 47617

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 4 | 62 | 8 | 58 | 5 | 59 |
| 48 | 18 | 45 | 19 | 41 | 23 | 44 | 22 |
| 25 | 39 | 28 | 38 | 32 | 34 | 29 | 35 |
| 16 | 50 | 13 | 51 | 9 | 55 | 12 | 54 |
| 57 | 7 | 60 | 6 | 64 | 2 | 61 | 3 |
| 24 | 42 | 21 | 43 | 17 | 47 | 20 | 46 |
| 33 | 31 | 36 | 30 | 40 | 26 | 37 | 27 |
| 56 | 10 | 53 | 11 | 49 | 15 | 52 | 14 |

3/ 9/ 2/ 5/12/14/ 50689

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 4 | 62 | 20 | 46 | 17 | 47 |
| 60 | 6 | 57 | 7 | 41 | 23 | 44 | 22 |
| 9 | 55 | 12 | 54 | 28 | 38 | 25 | 39 |
| 32 | 34 | 29 | 35 | 13 | 51 | 16 | 50 |
| 45 | 19 | 48 | 18 | 64 | 2 | 61 | 3 |
| 24 | 42 | 21 | 43 | 5 | 59 | 8 | 58 |
| 37 | 27 | 40 | 26 | 56 | 10 | 53 | 11 |
| 52 | 14 | 49 | 15 | 33 | 31 | 36 | 30 |

3/10/ 2/ 5/11/13/ 52417

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 17 | 62 | 20 | 46 | 4 | 47 |
| 60 | 6 | 44 | 7 | 41 | 23 | 57 | 22 |
| 9 | 55 | 25 | 54 | 28 | 38 | 12 | 39 |
| 32 | 34 | 16 | 35 | 13 | 51 | 29 | 50 |
| 45 | 19 | 61 | 18 | 64 | 2 | 48 | 3 |
| 24 | 42 | 8 | 43 | 5 | 59 | 21 | 58 |
| 37 | 27 | 53 | 26 | 56 | 10 | 40 | 11 |
| 52 | 14 | 36 | 15 | 33 | 31 | 49 | 30 |

3/11/ 2/ 5/10/13/ 54145

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 3 | 48 | 20 | 46 | 18 | 61 |
| 60 | 6 | 58 | 21 | 41 | 23 | 43 | 8 |
| 9 | 55 | 11 | 40 | 28 | 38 | 26 | 53 |
| 32 | 34 | 30 | 49 | 13 | 51 | 15 | 36 |
| 45 | 19 | 47 | 4 | 64 | 2 | 62 | 17 |
| 24 | 42 | 22 | 57 | 5 | 59 | 7 | 44 |
| 37 | 27 | 39 | 12 | 56 | 10 | 54 | 25 |
| 52 | 14 | 50 | 29 | 33 | 31 | 35 | 16 |

3/12/ 2/ 5/ 9/14/ 55009

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 18 | 48 | 20 | 46 | 3 | 61 |
| 60 | 6 | 43 | 21 | 41 | 23 | 58 | 8 |
| 9 | 55 | 26 | 40 | 28 | 38 | 11 | 53 |
| 32 | 34 | 15 | 49 | 13 | 51 | 30 | 36 |
| 45 | 19 | 62 | 4 | 64 | 2 | 47 | 17 |
| 24 | 42 | 7 | 57 | 5 | 59 | 22 | 44 |
| 37 | 27 | 54 | 12 | 56 | 10 | 39 | 25 |
| 52 | 14 | 35 | 29 | 33 | 31 | 50 | 16 |

3/17/ 2/ 5/10/11/ 55873

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 17 | 64 | 3 | 63 | 4 | 45 | 18 | 46 |
| 44 | 5 | 58 | 6 | 57 | 24 | 43 | 23 |
| 25 | 56 | 11 | 55 | 12 | 37 | 26 | 38 |
| 16 | 33 | 30 | 34 | 29 | 52 | 15 | 51 |
| 61 | 20 | 47 | 19 | 48 | 1 | 62 | 2 |
| 8 | 41 | 22 | 42 | 21 | 60 | 7 | 59 |
| 53 | 28 | 39 | 27 | 40 | 9 | 54 | 10 |
| 36 | 13 | 50 | 14 | 49 | 32 | 35 | 31 |

3/18/ 2/ 5/ 9/12/ 57601

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 17 | 64 | 18 | 63 | 4 | 45 | 3 | 46 |
| 44 | 5 | 43 | 6 | 57 | 24 | 58 | 23 |
| 25 | 56 | 26 | 55 | 12 | 37 | 11 | 38 |
| 16 | 33 | 15 | 34 | 29 | 52 | 30 | 51 |
| 61 | 20 | 62 | 19 | 48 | 1 | 47 | 2 |
| 8 | 41 | 7 | 42 | 21 | 60 | 22 | 59 |
| 53 | 28 | 54 | 27 | 40 | 9 | 39 | 10 |
| 36 | 13 | 35 | 14 | 49 | 32 | 50 | 31 |

3/21/ 2/ 5/ 9/14/ 59329

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 17 | 47 | 2 | 64 | 4 | 62 | 19 | 45 |
| 44 | 22 | 59 | 5 | 57 | 7 | 42 | 24 |
| 25 | 39 | 10 | 56 | 12 | 54 | 27 | 37 |
| 16 | 50 | 31 | 33 | 29 | 35 | 14 | 52 |
| 61 | 3 | 46 | 20 | 48 | 18 | 63 | 1 |
| 8 | 58 | 23 | 41 | 21 | 43 | 6 | 60 |
| 53 | 11 | 38 | 28 | 40 | 26 | 55 | 9 |
| 36 | 30 | 51 | 13 | 49 | 15 | 34 | 32 |

4/ 1/ 6/ 9/12/14/ 61057

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 4 | 62 | 8 | 58 | 5 | 59 |
| 56 | 10 | 53 | 11 | 49 | 15 | 52 | 14 |
| 41 | 23 | 44 | 22 | 48 | 18 | 45 | 19 |
| 32 | 34 | 29 | 35 | 25 | 39 | 28 | 38 |
| 57 | 7 | 60 | 6 | 64 | 2 | 61 | 3 |
| 16 | 50 | 13 | 51 | 9 | 55 | 12 | 54 |
| 17 | 47 | 20 | 46 | 24 | 42 | 21 | 43 |
| 40 | 26 | 37 | 27 | 33 | 31 | 36 | 30 |

5/ 2/ 3/ 9/12/14/ 83713

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 4 | 62 | 8 | 58 | 5 | 59 |
| 32 | 34 | 29 | 35 | 25 | 39 | 28 | 38 |
| 17 | 47 | 20 | 46 | 24 | 42 | 21 | 43 |
| 56 | 10 | 53 | 11 | 49 | 15 | 52 | 14 |
| 57 | 7 | 60 | 6 | 64 | 2 | 61 | 3 |
| 40 | 26 | 37 | 27 | 33 | 31 | 36 | 30 |
| 41 | 23 | 44 | 22 | 48 | 18 | 45 | 19 |
| 16 | 50 | 13 | 51 | 9 | 55 | 12 | 54 |

6/ 1/ 4/ 9/12/14/129793

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 4 | 62 | 8 | 58 | 5 | 59 |
| 32 | 34 | 29 | 35 | 25 | 39 | 28 | 38 |
| 41 | 23 | 44 | 22 | 48 | 18 | 45 | 19 |
| 56 | 10 | 53 | 11 | 49 | 15 | 52 | 14 |
| 57 | 7 | 60 | 6 | 64 | 2 | 61 | 3 |
| 40 | 26 | 37 | 27 | 33 | 31 | 36 | 30 |
| 17 | 47 | 20 | 46 | 24 | 42 | 21 | 43 |
| 16 | 50 | 13 | 51 | 9 | 55 | 12 | 54 |

7/ 1/ 4/ 9/12/14/175873

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 4 | 62 | 8 | 58 | 5 | 59 |
| 32 | 34 | 29 | 35 | 25 | 39 | 28 | 38 |
| 9 | 55 | 12 | 54 | 16 | 50 | 13 | 51 |
| 24 | 42 | 21 | 43 | 17 | 47 | 20 | 46 |
| 57 | 7 | 60 | 6 | 64 | 2 | 61 | 3 |
| 40 | 26 | 37 | 27 | 33 | 31 | 36 | 30 |
| 49 | 15 | 52 | 14 | 56 | 10 | 53 | 11 |
| 48 | 18 | 45 | 19 | 41 | 23 | 44 | 22 |

8/ 2/ 3/ 9/12/14/221953

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 4 | 62 | 8 | 58 | 5 | 59 |
| 32 | 34 | 29 | 35 | 25 | 39 | 28 | 38 |
| 49 | 15 | 52 | 14 | 56 | 10 | 53 | 11 |
| 24 | 42 | 21 | 43 | 17 | 47 | 20 | 46 |
| 57 | 7 | 60 | 6 | 64 | 2 | 61 | 3 |
| 40 | 26 | 37 | 27 | 33 | 31 | 36 | 30 |
| 9 | 55 | 12 | 54 | 16 | 50 | 13 | 51 |
| 48 | 18 | 45 | 19 | 41 | 23 | 44 | 22 |

9/ 1/ 4/ 6/12/14/268033

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 4 | 62 | 36 | 30 | 33 | 31 |
| 60 | 6 | 57 | 7 | 25 | 39 | 28 | 38 |
| 13 | 51 | 16 | 50 | 48 | 18 | 45 | 19 |
| 56 | 10 | 53 | 11 | 21 | 43 | 24 | 42 |
| 29 | 35 | 32 | 34 | 64 | 2 | 61 | 3 |
| 40 | 26 | 37 | 27 | 5 | 59 | 8 | 58 |
| 17 | 47 | 20 | 46 | 52 | 14 | 49 | 15 |
| 44 | 22 | 41 | 23 | 9 | 55 | 12 | 54 |

10/ 1/ 4/ 6/11/13/294913

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 33 | 62 | 36 | 30 | 4 | 31 |
| 60 | 6 | 28 | 7 | 25 | 39 | 57 | 38 |
| 13 | 51 | 45 | 50 | 48 | 18 | 16 | 19 |
| 56 | 10 | 24 | 11 | 21 | 43 | 53 | 42 |
| 29 | 35 | 61 | 34 | 64 | 2 | 32 | 3 |
| 40 | 26 | 8 | 27 | 5 | 59 | 37 | 58 |
| 17 | 47 | 49 | 46 | 52 | 14 | 20 | 15 |
| 44 | 22 | 12 | 23 | 9 | 55 | 41 | 54 |

11/ 1/ 4/ 6/10/13/321793

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 3 | 32 | 36 | 30 | 34 | 61 |
| 60 | 6 | 58 | 37 | 25 | 39 | 27 | 8 |
| 13 | 51 | 15 | 20 | 48 | 18 | 46 | 49 |
| 56 | 10 | 54 | 41 | 21 | 43 | 23 | 12 |
| 29 | 35 | 31 | 4 | 64 | 2 | 62 | 33 |
| 40 | 26 | 38 | 57 | 5 | 59 | 7 | 28 |
| 17 | 47 | 19 | 16 | 52 | 14 | 50 | 45 |
| 44 | 22 | 42 | 53 | 9 | 55 | 11 | 24 |

12/ 1/ 4/ 6/ 9/14/345217

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 34 | 32 | 36 | 30 | 3 | 61 |
| 60 | 6 | 27 | 37 | 25 | 39 | 58 | 8 |
| 13 | 51 | 46 | 20 | 48 | 18 | 15 | 49 |
| 56 | 10 | 23 | 41 | 21 | 43 | 54 | 12 |
| 29 | 35 | 62 | 4 | 64 | 2 | 31 | 33 |
| 40 | 26 | 7 | 57 | 5 | 59 | 38 | 28 |
| 17 | 47 | 50 | 16 | 52 | 14 | 19 | 45 |
| 44 | 22 | 11 | 53 | 9 | 55 | 42 | 24 |

```
 [Count = 368640]

[Count according to the Value of n1]
   1: 23040   2: 23040   3: 22656   4: 22656   5: 21696   6: 21696   7: 21312   8: 21312
   9: 18240  10: 18240  11: 17856  12: 17856  13: 16896  14: 16896  15: 16512  16: 16512
  17:  6528  18:  6528  19:  6144  20:  6144  21:  5184  22:  5184  23:  4800  24:  4800
  25:  1728  26:  1728  27:  1344  28:  1344  29:   384  30:   384  31:     0  32:     0
* OK! *
```

The result shows we have succeeded in composing 'Composite & Complete' MS88, since the total count of solutions becomes the same with the one we got before.

It means that every 'C&C' MS88 is always 'Complete Euler Square' of order 8, and the solution set of 'C&C' MS88 is included in the set of 'Complete Euler Squares' 8x8. The former makes the subset of the latter.

I was extremely surprised when I felt the execution speed of this program. It took only a few minutes even for my old machine to count up to the last. How wonderful!

### 5. How to Get the Complete List of 90 Fundamental Solutions?

It is easy for you to get the list of 90 Fundamental Solutions of 'C&C' MS88 with n1=1. You may only add the selection program to the one above.

But if you want to have such a faster program as you can, you have to cut off the waste part of the program above.

Since the fundamental solutions are picked up from the solution set of standard form with n1=1 in general, you could cut off half of Latin Squares to get only 16.

```
A1*32 + B1*16 + C1*8 + D1*4 + E1*2 + F1*1 + 1 = 1
Therefore A1=0; B1=0; C1=0; D1=0; E1=0; F1=0
```

And add the next inequality conditions complex before listing.

```
/**/
       if((nm[1]==1)&&(nm[3]<nm[7])&&(nm[7]<nm[5])){
        if((nm[2]>nm[4])&&(nm[4]>nm[8])&&(nm[8]>nm[6])){
         if((nm[2]>nm[9])&&(nm[17]<nm[49])&&(nm[49]<nm[33])){
          if((nm[9]>nm[25])&&(nm[25]>nm[57])&&(nm[57]>nm[41])){
            ......}}}}
      ......
/**/
```

The next list shows the result of my recent calculation.

```
** 'Composite & Complete' Magic Squares of Order 8 **
** Made by 'New Euler's Method' with Binary System **
 ** Part of 90 Fundamental Solutions with n1==1 **

[Latin Squares of Binary Decompositions]
       1/        2/        3/        4/        5/        6/        7/        8/
  01010101  01010101  01010101  01010101  01010101  01010101  01010101  01010101
  10101010  10101010  10101010  10101010  01010101  01010101  01010101  01010101
  01010101  10101010  01010101  10101010  01010101  10101010  01010101  10101010
  10101010  10101010  01010101  01010101  10101010  10101010  01010101  01010101
  10101010  10101010  10101010  10101010  10101010  10101010  10101010  10101010
  01010101  01010101  01010101  01010101  10101010  10101010  10101010  10101010
  10101010  01010101  10101010  01010101  10101010  01010101  10101010  01010101
  01010101  01010101  10101010  10101010  01010101  01010101  10101010  10101010
```

| 9/ | 10/ | 11/ | 12/ | 13/ | 14/ | 15/ | 16/ |
|---|---|---|---|---|---|---|---|
| 01011010 | 01111000 | 01001011 | 01101001 | 00011110 | 00111100 | 00001111 | 00101101 |
| 10100101 | 10000111 | 10110100 | 10010110 | 11100001 | 11000011 | 11110000 | 11010010 |
| 01011010 | 01111000 | 01001011 | 01101001 | 00011110 | 00111100 | 00001111 | 00101101 |
| 10100101 | 10000111 | 10110100 | 10010110 | 11100001 | 11000011 | 11110000 | 11010010 |
| 01011010 | 01111000 | 01001011 | 01101001 | 00011110 | 00111100 | 00001111 | 00101101 |
| 10100101 | 10000111 | 10110100 | 10010110 | 11100001 | 11000011 | 11110000 | 11010010 |
| 01011010 | 01111000 | 01001011 | 01101001 | 00011110 | 00111100 | 00001111 | 00101101 |
| 10100101 | 10000111 | 10110100 | 10010110 | 11100001 | 11000011 | 11110000 | 11010010 |

1/ 4/ 6/ 9/12/14/ 1#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 4 | 62 | 8 | 58 | 5 | 59 |
| 56 | 10 | 53 | 11 | 49 | 15 | 52 | 14 |
| 25 | 39 | 28 | 38 | 32 | 34 | 29 | 35 |
| 48 | 18 | 45 | 19 | 41 | 23 | 44 | 22 |
| 57 | 7 | 60 | 6 | 64 | 2 | 61 | 3 |
| 16 | 50 | 13 | 51 | 9 | 55 | 12 | 54 |
| 33 | 31 | 36 | 30 | 40 | 26 | 37 | 27 |
| 24 | 42 | 21 | 43 | 17 | 47 | 20 | 46 |

1/ 4/ 6/ 9/12/15/ 2#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 3 | 61 | 8 | 58 | 6 | 60 |
| 56 | 10 | 54 | 12 | 49 | 15 | 51 | 13 |
| 25 | 39 | 27 | 37 | 32 | 34 | 30 | 36 |
| 48 | 18 | 46 | 20 | 41 | 23 | 43 | 21 |
| 57 | 7 | 59 | 5 | 64 | 2 | 62 | 4 |
| 16 | 50 | 14 | 52 | 9 | 55 | 11 | 53 |
| 33 | 31 | 35 | 29 | 40 | 26 | 38 | 28 |
| 24 | 42 | 22 | 44 | 17 | 47 | 19 | 45 |

1/ 4/ 6/ 9/15/12/ 3#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 62 | 2 | 61 | 8 | 59 | 7 | 60 |
| 56 | 11 | 55 | 12 | 49 | 14 | 50 | 13 |
| 25 | 38 | 26 | 37 | 32 | 35 | 31 | 36 |
| 48 | 19 | 47 | 20 | 41 | 22 | 42 | 21 |
| 57 | 6 | 58 | 5 | 64 | 3 | 63 | 4 |
| 16 | 51 | 15 | 52 | 9 | 54 | 10 | 53 |
| 33 | 30 | 34 | 29 | 40 | 27 | 39 | 28 |
| 24 | 43 | 23 | 44 | 17 | 46 | 18 | 45 |

1/ 4/ 7/ 9/12/14/ 4#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 4 | 62 | 8 | 58 | 5 | 59 |
| 56 | 10 | 53 | 11 | 49 | 15 | 52 | 14 |
| 17 | 47 | 20 | 46 | 24 | 42 | 21 | 43 |
| 40 | 26 | 37 | 27 | 33 | 31 | 36 | 30 |
| 57 | 7 | 60 | 6 | 64 | 2 | 61 | 3 |
| 16 | 50 | 13 | 51 | 9 | 55 | 12 | 54 |
| 41 | 23 | 44 | 22 | 48 | 18 | 45 | 19 |
| 32 | 34 | 29 | 35 | 25 | 39 | 28 | 38 |

1/ 4/ 7/ 9/12/15/ 5#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 3 | 61 | 8 | 58 | 6 | 60 |
| 56 | 10 | 54 | 12 | 49 | 15 | 51 | 13 |
| 17 | 47 | 19 | 45 | 24 | 42 | 22 | 44 |
| 40 | 26 | 38 | 28 | 33 | 31 | 35 | 29 |
| 57 | 7 | 59 | 5 | 64 | 2 | 62 | 4 |
| 16 | 50 | 14 | 52 | 9 | 55 | 11 | 53 |
| 41 | 23 | 43 | 21 | 48 | 18 | 46 | 20 |
| 32 | 34 | 30 | 36 | 25 | 39 | 27 | 37 |

1/ 4/ 7/ 9/15/12/ 6#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 62 | 2 | 61 | 8 | 59 | 7 | 60 |
| 56 | 11 | 55 | 12 | 49 | 14 | 50 | 13 |
| 17 | 46 | 18 | 45 | 24 | 43 | 23 | 44 |
| 40 | 27 | 39 | 28 | 33 | 30 | 34 | 29 |
| 57 | 6 | 58 | 5 | 64 | 3 | 63 | 4 |
| 16 | 51 | 15 | 52 | 9 | 54 | 10 | 53 |
| 41 | 22 | 42 | 21 | 48 | 19 | 47 | 20 |
| 32 | 35 | 31 | 36 | 25 | 38 | 26 | 37 |

1/ 4/ 9/ 6/12/14/ 7#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 4 | 62 | 12 | 54 | 9 | 55 |
| 60 | 6 | 57 | 7 | 49 | 15 | 52 | 14 |
| 21 | 43 | 24 | 42 | 32 | 34 | 29 | 35 |
| 48 | 18 | 45 | 19 | 37 | 27 | 40 | 26 |
| 53 | 11 | 56 | 10 | 64 | 2 | 61 | 3 |
| 16 | 50 | 13 | 51 | 5 | 59 | 8 | 58 |
| 33 | 31 | 36 | 30 | 44 | 22 | 41 | 23 |
| 28 | 38 | 25 | 39 | 17 | 47 | 20 | 46 |

1/ 4/ 9/ 6/12/15/ 8#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 3 | 61 | 12 | 54 | 10 | 56 |
| 60 | 6 | 58 | 8 | 49 | 15 | 51 | 13 |
| 21 | 43 | 23 | 41 | 32 | 34 | 30 | 36 |
| 48 | 18 | 46 | 20 | 37 | 27 | 39 | 25 |
| 53 | 11 | 55 | 9 | 64 | 2 | 62 | 4 |
| 16 | 50 | 14 | 52 | 5 | 59 | 7 | 57 |
| 33 | 31 | 35 | 29 | 44 | 22 | 42 | 24 |
| 28 | 38 | 26 | 40 | 17 | 47 | 19 | 45 |

1/ 4/ 9/ 6/15/12/ 9#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 62 | 2 | 61 | 12 | 55 | 11 | 56 |
| 60 | 7 | 59 | 8 | 49 | 14 | 50 | 13 |
| 21 | 42 | 22 | 41 | 32 | 35 | 31 | 36 |
| 48 | 19 | 47 | 20 | 37 | 26 | 38 | 25 |
| 53 | 10 | 54 | 9 | 64 | 3 | 63 | 4 |
| 16 | 51 | 15 | 52 | 5 | 58 | 6 | 57 |
| 33 | 30 | 34 | 29 | 44 | 23 | 43 | 24 |
| 28 | 39 | 27 | 40 | 17 | 46 | 18 | 45 |

1/ 4/ 9/ 7/12/14/ 10#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 4 | 62 | 12 | 54 | 9 | 55 |
| 60 | 6 | 57 | 7 | 49 | 15 | 52 | 14 |
| 17 | 47 | 20 | 46 | 28 | 38 | 25 | 39 |
| 44 | 22 | 41 | 23 | 33 | 31 | 36 | 30 |
| 53 | 11 | 56 | 10 | 64 | 2 | 61 | 3 |
| 16 | 50 | 13 | 51 | 5 | 59 | 8 | 58 |
| 37 | 27 | 40 | 26 | 48 | 18 | 45 | 19 |
| 32 | 34 | 29 | 35 | 21 | 43 | 24 | 42 |

1/ 4/ 9/ 7/12/15/ 11#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 3 | 61 | 12 | 54 | 10 | 56 |
| 60 | 6 | 58 | 8 | 49 | 15 | 51 | 13 |
| 17 | 47 | 19 | 45 | 28 | 38 | 26 | 40 |
| 44 | 22 | 42 | 24 | 33 | 31 | 35 | 29 |
| 53 | 11 | 55 | 9 | 64 | 2 | 62 | 4 |
| 16 | 50 | 14 | 52 | 5 | 59 | 7 | 57 |
| 37 | 27 | 39 | 25 | 48 | 18 | 46 | 20 |
| 32 | 34 | 30 | 36 | 21 | 43 | 23 | 41 |

1/ 4/ 9/ 7/15/12/ 12#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 62 | 2 | 61 | 12 | 55 | 11 | 56 |
| 60 | 7 | 59 | 8 | 49 | 14 | 50 | 13 |
| 17 | 46 | 18 | 45 | 28 | 39 | 27 | 40 |
| 44 | 23 | 43 | 24 | 33 | 30 | 34 | 29 |
| 53 | 10 | 54 | 9 | 64 | 3 | 63 | 4 |
| 16 | 51 | 15 | 52 | 5 | 58 | 6 | 57 |
| 37 | 26 | 38 | 25 | 48 | 19 | 47 | 20 |
| 32 | 35 | 31 | 36 | 21 | 42 | 22 | 41 |

1/ 4/ 9/12/ 6/14/ 13#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 6 | 60 | 14 | 52 | 9 | 55 |
| 62 | 4 | 57 | 7 | 49 | 15 | 54 | 12 |
| 19 | 45 | 24 | 42 | 32 | 34 | 27 | 37 |
| 48 | 18 | 43 | 21 | 35 | 29 | 40 | 26 |
| 51 | 13 | 56 | 10 | 64 | 2 | 59 | 5 |
| 16 | 50 | 11 | 53 | 3 | 61 | 8 | 58 |
| 33 | 31 | 38 | 28 | 46 | 20 | 41 | 23 |
| 30 | 36 | 25 | 39 | 17 | 47 | 22 | 44 |

1/ 4/ 9/12/ 6/15/ 14#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 5 | 59 | 14 | 52 | 10 | 56 |
| 62 | 4 | 58 | 8 | 49 | 15 | 53 | 11 |
| 19 | 45 | 23 | 41 | 32 | 34 | 28 | 38 |
| 48 | 18 | 44 | 22 | 35 | 29 | 39 | 25 |
| 51 | 13 | 55 | 9 | 64 | 2 | 60 | 6 |
| 16 | 50 | 12 | 54 | 3 | 61 | 7 | 57 |
| 33 | 31 | 37 | 27 | 46 | 20 | 42 | 24 |
| 30 | 36 | 26 | 40 | 17 | 47 | 21 | 43 |

1/ 4/ 9/12/ 7/14/ 15#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 6 | 60 | 14 | 52 | 9 | 55 |
| 62 | 4 | 57 | 7 | 49 | 15 | 54 | 12 |
| 17 | 47 | 22 | 44 | 30 | 36 | 25 | 39 |
| 46 | 20 | 41 | 23 | 33 | 31 | 38 | 28 |
| 51 | 13 | 56 | 10 | 64 | 2 | 59 | 5 |
| 16 | 50 | 11 | 53 | 3 | 61 | 8 | 58 |
| 35 | 29 | 40 | 26 | 48 | 18 | 43 | 21 |
| 32 | 34 | 27 | 37 | 19 | 45 | 24 | 42 |

1/ 4/ 9/12/ 7/15/ 16#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 5 | 59 | 14 | 52 | 10 | 56 |
| 62 | 4 | 58 | 8 | 49 | 15 | 53 | 11 |
| 17 | 47 | 21 | 43 | 30 | 36 | 26 | 40 |
| 46 | 20 | 42 | 24 | 33 | 31 | 37 | 27 |
| 51 | 13 | 55 | 9 | 64 | 2 | 60 | 6 |
| 16 | 50 | 12 | 54 | 3 | 61 | 7 | 57 |
| 35 | 29 | 39 | 25 | 48 | 18 | 44 | 22 |
| 32 | 34 | 28 | 38 | 19 | 45 | 23 | 41 |

1/ 7/ 4/ 9/12/14/ 17#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 4 | 62 | 8 | 58 | 5 | 59 |
| 48 | 18 | 45 | 19 | 41 | 23 | 44 | 22 |
| 9 | 55 | 12 | 54 | 16 | 50 | 13 | 51 |
| 40 | 26 | 37 | 27 | 33 | 31 | 36 | 30 |
| 57 | 7 | 60 | 6 | 64 | 2 | 61 | 3 |
| 24 | 42 | 21 | 43 | 17 | 47 | 20 | 46 |
| 49 | 15 | 52 | 14 | 56 | 10 | 53 | 11 |
| 32 | 34 | 29 | 35 | 25 | 39 | 28 | 38 |

1/ 7/ 4/ 9/12/15/ 18#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 3 | 61 | 8 | 58 | 6 | 60 |
| 48 | 18 | 46 | 20 | 41 | 23 | 43 | 21 |
| 9 | 55 | 11 | 53 | 16 | 50 | 14 | 52 |
| 40 | 26 | 38 | 28 | 33 | 31 | 35 | 29 |
| 57 | 7 | 59 | 5 | 64 | 2 | 62 | 4 |
| 24 | 42 | 22 | 44 | 17 | 47 | 19 | 45 |
| 49 | 15 | 51 | 13 | 56 | 10 | 54 | 12 |
| 32 | 34 | 30 | 36 | 25 | 39 | 27 | 37 |

1/ 7/ 4/ 9/15/12/ 19#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 62 | 2 | 61 | 8 | 59 | 7 | 60 |
| 48 | 19 | 47 | 20 | 41 | 22 | 42 | 21 |
| 9 | 54 | 10 | 53 | 16 | 51 | 15 | 52 |
| 40 | 27 | 39 | 28 | 33 | 30 | 34 | 29 |
| 57 | 6 | 58 | 5 | 64 | 3 | 63 | 4 |
| 24 | 43 | 23 | 44 | 17 | 46 | 18 | 45 |
| 49 | 14 | 50 | 13 | 56 | 11 | 55 | 12 |
| 32 | 35 | 31 | 36 | 25 | 38 | 26 | 37 |

1/ 7/ 9/ 4/12/14/ 20#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 4 | 62 | 12 | 54 | 9 | 55 |
| 48 | 18 | 45 | 19 | 37 | 27 | 40 | 26 |
| 5 | 59 | 8 | 58 | 16 | 50 | 13 | 51 |
| 44 | 22 | 41 | 23 | 33 | 31 | 36 | 30 |
| 53 | 11 | 56 | 10 | 64 | 2 | 61 | 3 |
| 28 | 38 | 25 | 39 | 17 | 47 | 20 | 46 |
| 49 | 15 | 52 | 14 | 60 | 6 | 57 | 7 |
| 32 | 34 | 29 | 35 | 21 | 43 | 24 | 42 |

1/ 7/ 9/ 4/12/15/ 21#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 3 | 61 | 12 | 54 | 10 | 56 |
| 48 | 18 | 46 | 20 | 37 | 27 | 39 | 25 |
| 5 | 59 | 7 | 57 | 16 | 50 | 14 | 52 |
| 44 | 22 | 42 | 24 | 33 | 31 | 35 | 29 |
| 53 | 11 | 55 | 9 | 64 | 2 | 62 | 4 |
| 28 | 38 | 26 | 40 | 17 | 47 | 19 | 45 |
| 49 | 15 | 51 | 13 | 60 | 6 | 58 | 8 |
| 32 | 34 | 30 | 36 | 21 | 43 | 23 | 41 |

1/ 7/ 9/ 4/15/12/ 22#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 62 | 2 | 61 | 12 | 55 | 11 | 56 |
| 48 | 19 | 47 | 20 | 37 | 26 | 38 | 25 |
| 5 | 58 | 6 | 57 | 16 | 51 | 15 | 52 |
| 44 | 23 | 43 | 24 | 33 | 30 | 34 | 29 |
| 53 | 10 | 54 | 9 | 64 | 3 | 63 | 4 |
| 28 | 39 | 27 | 40 | 17 | 46 | 18 | 45 |
| 49 | 14 | 50 | 13 | 60 | 7 | 59 | 8 |
| 32 | 35 | 31 | 36 | 21 | 42 | 22 | 41 |

1/ 7/ 9/12/ 4/14/ 23#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 6 | 60 | 14 | 52 | 9 | 55 |
| 48 | 18 | 43 | 21 | 35 | 29 | 40 | 26 |
| 3 | 61 | 8 | 58 | 16 | 50 | 11 | 53 |
| 46 | 20 | 41 | 23 | 33 | 31 | 38 | 28 |
| 51 | 13 | 56 | 10 | 64 | 2 | 59 | 5 |
| 30 | 36 | 25 | 39 | 17 | 47 | 22 | 44 |
| 49 | 15 | 54 | 12 | 62 | 4 | 57 | 7 |
| 32 | 34 | 27 | 37 | 19 | 45 | 24 | 42 |

1/ 7/ 9/12/ 4/15/ 24#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 5 | 59 | 14 | 52 | 10 | 56 |
| 48 | 18 | 44 | 22 | 35 | 29 | 39 | 25 |
| 3 | 61 | 7 | 57 | 16 | 50 | 12 | 54 |
| 46 | 20 | 42 | 24 | 33 | 31 | 37 | 27 |
| 51 | 13 | 55 | 9 | 64 | 2 | 60 | 6 |
| 30 | 36 | 26 | 40 | 17 | 47 | 21 | 43 |
| 49 | 15 | 53 | 11 | 62 | 4 | 58 | 8 |
| 32 | 34 | 28 | 38 | 19 | 45 | 23 | 41 |

1/ 7/ 9/12/14/ 4/ 25#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 62 | 7 | 60 | 15 | 52 | 9 | 54 |
| 48 | 19 | 42 | 21 | 34 | 29 | 40 | 27 |
| 2 | 61 | 8 | 59 | 16 | 51 | 10 | 53 |
| 47 | 20 | 41 | 22 | 33 | 30 | 39 | 28 |
| 50 | 13 | 56 | 11 | 64 | 3 | 58 | 5 |
| 31 | 36 | 25 | 38 | 17 | 46 | 23 | 44 |
| 49 | 14 | 55 | 12 | 63 | 4 | 57 | 6 |
| 32 | 35 | 26 | 37 | 18 | 45 | 24 | 43 |

1/ 7/ 9/12/15/ 4/ 26#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 62 | 5 | 58 | 15 | 52 | 11 | 56 |
| 48 | 19 | 44 | 23 | 34 | 29 | 38 | 25 |
| 2 | 61 | 6 | 57 | 16 | 51 | 12 | 55 |
| 47 | 20 | 43 | 24 | 33 | 30 | 37 | 26 |
| 50 | 13 | 54 | 9 | 64 | 3 | 60 | 7 |
| 31 | 36 | 27 | 40 | 17 | 46 | 21 | 42 |
| 49 | 14 | 53 | 10 | 63 | 4 | 59 | 8 |
| 32 | 35 | 28 | 39 | 18 | 45 | 22 | 41 |

1/ 7/ 9/15/ 4/12/ 27#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 60 | 2 | 59 | 14 | 55 | 13 | 56 |
| 48 | 21 | 47 | 22 | 35 | 26 | 36 | 25 |
| 3 | 58 | 4 | 57 | 16 | 53 | 15 | 54 |
| 46 | 23 | 45 | 24 | 33 | 28 | 34 | 27 |
| 51 | 10 | 52 | 9 | 64 | 5 | 63 | 6 |
| 30 | 39 | 29 | 40 | 17 | 44 | 18 | 43 |
| 49 | 12 | 50 | 11 | 62 | 7 | 61 | 8 |
| 32 | 37 | 31 | 38 | 19 | 42 | 20 | 41 |

1/ 7/ 9/15/12/ 4/ 28#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 60 | 3 | 58 | 15 | 54 | 13 | 56 |
| 48 | 21 | 46 | 23 | 34 | 27 | 36 | 25 |
| 2 | 59 | 4 | 57 | 16 | 53 | 14 | 55 |
| 47 | 22 | 45 | 24 | 33 | 28 | 35 | 26 |
| 50 | 11 | 52 | 9 | 64 | 5 | 62 | 7 |
| 31 | 38 | 29 | 40 | 17 | 44 | 19 | 42 |
| 49 | 12 | 51 | 10 | 63 | 6 | 61 | 8 |
| 32 | 37 | 30 | 39 | 18 | 43 | 20 | 41 |

1/ 9/ 4/ 6/12/14/ 29#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 4 | 62 | 20 | 46 | 17 | 47 |
| 60 | 6 | 57 | 7 | 41 | 23 | 44 | 22 |
| 13 | 51 | 16 | 50 | 32 | 34 | 29 | 35 |
| 56 | 10 | 53 | 11 | 37 | 27 | 40 | 26 |
| 45 | 19 | 48 | 18 | 64 | 2 | 61 | 3 |
| 24 | 42 | 21 | 43 | 5 | 59 | 8 | 58 |
| 33 | 31 | 36 | 30 | 52 | 14 | 49 | 15 |
| 28 | 38 | 25 | 39 | 9 | 55 | 12 | 54 |

1/ 9/ 4/ 6/12/15/ 30#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 3 | 61 | 20 | 46 | 18 | 48 |
| 60 | 6 | 58 | 8 | 41 | 23 | 43 | 21 |
| 13 | 51 | 15 | 49 | 32 | 34 | 30 | 36 |
| 56 | 10 | 54 | 12 | 37 | 27 | 39 | 25 |
| 45 | 19 | 47 | 17 | 64 | 2 | 62 | 4 |
| 24 | 42 | 22 | 44 | 5 | 59 | 7 | 57 |
| 33 | 31 | 35 | 29 | 52 | 14 | 50 | 16 |
| 28 | 38 | 26 | 40 | 9 | 55 | 11 | 53 |

1/ 9/ 4/ 6/15/12/ 31#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 62 | 2 | 61 | 20 | 47 | 19 | 48 |
| 60 | 7 | 59 | 8 | 41 | 22 | 42 | 21 |
| 13 | 50 | 14 | 49 | 32 | 35 | 31 | 36 |
| 56 | 11 | 55 | 12 | 37 | 26 | 38 | 25 |
| 45 | 18 | 46 | 17 | 64 | 3 | 63 | 4 |
| 24 | 43 | 23 | 44 | 5 | 58 | 6 | 57 |
| 33 | 30 | 34 | 29 | 52 | 15 | 51 | 16 |
| 28 | 39 | 27 | 40 | 9 | 54 | 10 | 53 |

1/ 9/ 4/ 7/12/14/ 32#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 4 | 62 | 20 | 46 | 17 | 47 |
| 60 | 6 | 57 | 7 | 41 | 23 | 44 | 22 |
| 9 | 55 | 12 | 54 | 28 | 38 | 25 | 39 |
| 52 | 14 | 49 | 15 | 33 | 31 | 36 | 30 |
| 45 | 19 | 48 | 18 | 64 | 2 | 61 | 3 |
| 24 | 42 | 21 | 43 | 5 | 59 | 8 | 58 |
| 37 | 27 | 40 | 26 | 56 | 10 | 53 | 11 |
| 32 | 34 | 29 | 35 | 13 | 51 | 16 | 50 |

1/ 9/ 4/ 7/12/15/ 33#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 3 | 61 | 20 | 46 | 18 | 48 |
| 60 | 6 | 58 | 8 | 41 | 23 | 43 | 21 |
| 9 | 55 | 11 | 53 | 28 | 38 | 26 | 40 |
| 52 | 14 | 50 | 16 | 33 | 31 | 35 | 29 |
| 45 | 19 | 47 | 17 | 64 | 2 | 62 | 4 |
| 24 | 42 | 22 | 44 | 5 | 59 | 7 | 57 |
| 37 | 27 | 39 | 25 | 56 | 10 | 54 | 12 |
| 32 | 34 | 30 | 36 | 13 | 51 | 15 | 49 |

1/ 9/ 4/ 7/15/12/ 34#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 62 | 2 | 61 | 20 | 47 | 19 | 48 |
| 60 | 7 | 59 | 8 | 41 | 22 | 42 | 21 |
| 9 | 54 | 10 | 53 | 28 | 39 | 27 | 40 |
| 52 | 15 | 51 | 16 | 33 | 30 | 34 | 29 |
| 45 | 18 | 46 | 17 | 64 | 3 | 63 | 4 |
| 24 | 43 | 23 | 44 | 5 | 58 | 6 | 57 |
| 37 | 26 | 38 | 25 | 56 | 11 | 55 | 12 |
| 32 | 35 | 31 | 36 | 13 | 50 | 14 | 49 |

1/ 9/ 4/12/ 6/14/ 35#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 6 | 60 | 22 | 44 | 17 | 47 |
| 62 | 4 | 57 | 7 | 41 | 23 | 46 | 20 |
| 11 | 53 | 16 | 50 | 32 | 34 | 27 | 37 |
| 56 | 10 | 51 | 13 | 35 | 29 | 40 | 26 |
| 43 | 21 | 48 | 18 | 64 | 2 | 59 | 5 |
| 24 | 42 | 19 | 45 | 3 | 61 | 8 | 58 |
| 33 | 31 | 38 | 28 | 54 | 12 | 49 | 15 |
| 30 | 36 | 25 | 39 | 9 | 55 | 14 | 52 |

1/ 9/ 4/12/ 6/15/ 36#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 5 | 59 | 22 | 44 | 18 | 48 |
| 62 | 4 | 58 | 8 | 41 | 23 | 45 | 19 |
| 11 | 53 | 15 | 49 | 32 | 34 | 28 | 38 |
| 56 | 10 | 52 | 14 | 35 | 29 | 39 | 25 |
| 43 | 21 | 47 | 17 | 64 | 2 | 60 | 6 |
| 24 | 42 | 20 | 46 | 3 | 61 | 7 | 57 |
| 33 | 31 | 37 | 27 | 54 | 12 | 50 | 16 |
| 30 | 36 | 26 | 40 | 9 | 55 | 13 | 51 |

1/ 9/ 4/12/ 7/14/ 37#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 6 | 60 | 22 | 44 | 17 | 47 |
| 62 | 4 | 57 | 7 | 41 | 23 | 46 | 20 |
| 9 | 55 | 14 | 52 | 30 | 36 | 25 | 39 |
| 54 | 12 | 49 | 15 | 33 | 31 | 38 | 28 |
| 43 | 21 | 48 | 18 | 64 | 2 | 59 | 5 |
| 24 | 42 | 19 | 45 | 3 | 61 | 8 | 58 |
| 35 | 29 | 40 | 26 | 56 | 10 | 51 | 13 |
| 32 | 34 | 27 | 37 | 11 | 53 | 16 | 50 |

1/ 9/ 4/12/ 7/15/ 38#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 5 | 59 | 22 | 44 | 18 | 48 |
| 62 | 4 | 58 | 8 | 41 | 23 | 45 | 19 |
| 9 | 55 | 13 | 51 | 30 | 36 | 26 | 40 |
| 54 | 12 | 50 | 16 | 33 | 31 | 37 | 27 |
| 43 | 21 | 47 | 17 | 64 | 2 | 60 | 6 |
| 24 | 42 | 20 | 46 | 3 | 61 | 7 | 57 |
| 35 | 29 | 39 | 25 | 56 | 10 | 52 | 14 |
| 32 | 34 | 28 | 38 | 11 | 53 | 15 | 49 |

1/ 9/ 7/ 4/12/14/ 39#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 4 | 62 | 20 | 46 | 17 | 47 |
| 56 | 10 | 53 | 11 | 37 | 27 | 40 | 26 |
| 5 | 59 | 8 | 58 | 24 | 42 | 21 | 43 |
| 52 | 14 | 49 | 15 | 33 | 31 | 36 | 30 |
| 45 | 19 | 48 | 18 | 64 | 2 | 61 | 3 |
| 28 | 38 | 25 | 39 | 9 | 55 | 12 | 54 |
| 41 | 23 | 44 | 22 | 60 | 6 | 57 | 7 |
| 32 | 34 | 29 | 35 | 13 | 51 | 16 | 50 |

1/ 9/ 7/ 4/12/15/ 40#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 3 | 61 | 20 | 46 | 18 | 48 |
| 56 | 10 | 54 | 12 | 37 | 27 | 39 | 25 |
| 5 | 59 | 7 | 57 | 24 | 42 | 22 | 44 |
| 52 | 14 | 50 | 16 | 33 | 31 | 35 | 29 |
| 45 | 19 | 47 | 17 | 64 | 2 | 62 | 4 |
| 28 | 38 | 26 | 40 | 9 | 55 | 11 | 53 |
| 41 | 23 | 43 | 21 | 60 | 6 | 58 | 8 |
| 32 | 34 | 30 | 36 | 13 | 51 | 15 | 49 |

1/ 9/ 7/ 4/15/12/ 41#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 62 | 2 | 61 | 20 | 47 | 19 | 48 |
| 56 | 11 | 55 | 12 | 37 | 26 | 38 | 25 |
| 5 | 58 | 6 | 57 | 24 | 43 | 23 | 44 |
| 52 | 15 | 51 | 16 | 33 | 30 | 34 | 29 |
| 45 | 18 | 46 | 17 | 64 | 3 | 63 | 4 |
| 28 | 39 | 27 | 40 | 9 | 54 | 10 | 53 |
| 41 | 22 | 42 | 21 | 60 | 7 | 59 | 8 |
| 32 | 35 | 31 | 36 | 13 | 50 | 14 | 49 |

1/ 9/ 7/12/ 4/14/ 42#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 6 | 60 | 22 | 44 | 17 | 47 |
| 56 | 10 | 51 | 13 | 35 | 29 | 40 | 26 |
| 3 | 61 | 8 | 58 | 24 | 42 | 19 | 45 |
| 54 | 12 | 49 | 15 | 33 | 31 | 38 | 28 |
| 43 | 21 | 48 | 18 | 64 | 2 | 59 | 5 |
| 30 | 36 | 25 | 39 | 9 | 55 | 14 | 52 |
| 41 | 23 | 46 | 20 | 62 | 4 | 57 | 7 |
| 32 | 34 | 27 | 37 | 11 | 53 | 16 | 50 |

1/ 9/ 7/12/ 4/15/ 43#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 5 | 59 | 22 | 44 | 18 | 48 |
| 56 | 10 | 52 | 14 | 35 | 29 | 39 | 25 |
| 3 | 61 | 7 | 57 | 24 | 42 | 20 | 46 |
| 54 | 12 | 50 | 16 | 33 | 31 | 37 | 27 |
| 43 | 21 | 47 | 17 | 64 | 2 | 60 | 6 |
| 30 | 36 | 26 | 40 | 9 | 55 | 13 | 51 |
| 41 | 23 | 45 | 19 | 62 | 4 | 58 | 8 |
| 32 | 34 | 28 | 38 | 11 | 53 | 15 | 49 |

1/ 9/ 7/12/14/ 4/ 44#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 62 | 7 | 60 | 23 | 44 | 17 | 46 |
| 56 | 11 | 50 | 13 | 34 | 29 | 40 | 27 |
| 2 | 61 | 8 | 59 | 24 | 43 | 18 | 45 |
| 55 | 12 | 49 | 14 | 33 | 30 | 39 | 28 |
| 42 | 21 | 48 | 19 | 64 | 3 | 58 | 5 |
| 31 | 36 | 25 | 38 | 9 | 54 | 15 | 52 |
| 41 | 22 | 47 | 20 | 63 | 4 | 57 | 6 |
| 32 | 35 | 26 | 37 | 10 | 53 | 16 | 51 |

1/ 9/ 7/12/15/ 4/ 45#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 62 | 5 | 58 | 23 | 44 | 19 | 48 |
| 56 | 11 | 52 | 15 | 34 | 29 | 38 | 25 |
| 2 | 61 | 6 | 57 | 24 | 43 | 20 | 47 |
| 55 | 12 | 51 | 16 | 33 | 30 | 37 | 26 |
| 42 | 21 | 46 | 17 | 64 | 3 | 60 | 7 |
| 31 | 36 | 27 | 40 | 9 | 54 | 13 | 50 |
| 41 | 22 | 45 | 18 | 63 | 4 | 59 | 8 |
| 32 | 35 | 28 | 39 | 10 | 53 | 14 | 49 |

1/ 9/12/ 4/ 6/14/ 48#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 10 | 56 | 26 | 40 | 17 | 47 |
| 62 | 4 | 53 | 11 | 37 | 27 | 46 | 20 |
| 7 | 57 | 16 | 50 | 32 | 34 | 23 | 41 |
| 60 | 6 | 51 | 13 | 35 | 29 | 44 | 22 |
| 39 | 25 | 48 | 18 | 64 | 2 | 55 | 9 |
| 28 | 38 | 19 | 45 | 3 | 61 | 12 | 54 |
| 33 | 31 | 42 | 24 | 58 | 8 | 49 | 15 |
| 30 | 36 | 21 | 43 | 5 | 59 | 14 | 52 |

1/ 9/12/ 7/ 4/14/ 52#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 10 | 56 | 26 | 40 | 17 | 47 |
| 60 | 6 | 51 | 13 | 35 | 29 | 44 | 22 |
| 3 | 61 | 12 | 54 | 28 | 38 | 19 | 45 |
| 58 | 8 | 49 | 15 | 33 | 31 | 42 | 24 |
| 39 | 25 | 48 | 18 | 64 | 2 | 55 | 9 |
| 30 | 36 | 21 | 43 | 5 | 59 | 14 | 52 |
| 37 | 27 | 46 | 20 | 62 | 4 | 53 | 11 |
| 32 | 34 | 23 | 41 | 7 | 57 | 16 | 50 |

9/ 1/ 4/ 6/12/14/ 56#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 4 | 62 | 36 | 30 | 33 | 31 |
| 60 | 6 | 57 | 7 | 25 | 39 | 28 | 38 |
| 13 | 51 | 16 | 50 | 48 | 18 | 45 | 19 |
| 56 | 10 | 53 | 11 | 21 | 43 | 24 | 42 |
| 29 | 35 | 32 | 34 | 64 | 2 | 61 | 3 |
| 40 | 26 | 37 | 27 | 5 | 59 | 8 | 58 |
| 17 | 47 | 20 | 46 | 52 | 14 | 49 | 15 |
| 44 | 22 | 41 | 23 | 9 | 55 | 12 | 54 |

9/ 1/ 4/ 7/12/14/ 59#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 4 | 62 | 36 | 30 | 33 | 31 |
| 60 | 6 | 57 | 7 | 25 | 39 | 28 | 38 |
| 9 | 55 | 12 | 54 | 44 | 22 | 41 | 23 |
| 52 | 14 | 49 | 15 | 17 | 47 | 20 | 46 |
| 29 | 35 | 32 | 34 | 64 | 2 | 61 | 3 |
| 40 | 26 | 37 | 27 | 5 | 59 | 8 | 58 |
| 21 | 43 | 24 | 42 | 56 | 10 | 53 | 11 |
| 48 | 18 | 45 | 19 | 13 | 51 | 16 | 50 |

9/ 1/ 4/12/ 6/14/ 62#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 6 | 60 | 38 | 28 | 33 | 31 |
| 62 | 4 | 57 | 7 | 25 | 39 | 30 | 36 |
| 11 | 53 | 16 | 50 | 48 | 18 | 43 | 21 |
| 56 | 10 | 51 | 13 | 19 | 45 | 24 | 42 |
| 27 | 37 | 32 | 34 | 64 | 2 | 59 | 5 |
| 40 | 26 | 35 | 29 | 3 | 61 | 8 | 58 |
| 17 | 47 | 22 | 44 | 54 | 12 | 49 | 15 |
| 46 | 20 | 41 | 23 | 9 | 55 | 14 | 52 |

9/ 1/ 7/ 4/12/14/ 66#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 4 | 62 | 36 | 30 | 33 | 31 |
| 56 | 10 | 53 | 11 | 21 | 43 | 24 | 42 |
| 5 | 59 | 8 | 58 | 40 | 26 | 37 | 27 |
| 52 | 14 | 49 | 15 | 17 | 47 | 20 | 46 |
| 29 | 35 | 32 | 34 | 64 | 2 | 61 | 3 |
| 44 | 22 | 41 | 23 | 9 | 55 | 12 | 54 |
| 25 | 39 | 28 | 38 | 60 | 6 | 57 | 7 |
| 48 | 18 | 45 | 19 | 13 | 51 | 16 | 50 |

```
 9/ 1/ 7/12/ 4/14/  69#     9/ 1/ 7/15/ 4/12/  73#     9/ 1/12/ 4/ 6/14/  75#
 1 63  6 60 38 28 33 31     1 60  2 59 38 31 37 32     1 63 10 56 42 24 33 31
56 10 51 13 19 45 24 42    56 13 55 14 19 42 20 41    62  4 53 11 21 43 30 36
 3 61  8 58 40 26 35 29     3 58  4 57 40 29 39 30     7 57 16 50 48 18 39 25
54 12 49 15 17 47 22 44    54 15 53 16 17 44 18 43    60  6 51 13 19 45 28 38
27 37 32 34 64  2 59  5    27 34 28 33 64  5 63  6    23 41 32 34 64  2 55  9
46 20 41 23  9 55 14 52    46 23 45 24  9 52 10 51    44 22 35 29  3 61 12 54
25 39 30 36 62  4 57  7    25 36 26 35 62  7 61  8    17 47 26 40 58  8 49 15
48 18 43 21 11 53 16 50    48 21 47 22 11 50 12 49    46 20 37 27  5 59 14 52

 9/ 1/12/ 7/ 4/14/  79#     9/12/ 1/ 4/ 6/14/  83#     9/12/ 1/ 7/ 4/14/  87#
 1 63 10 56 42 24 33 31     1 63 18 48 50 16 33 31     1 63 18 48 50 16 33 31
60  6 51 13 19 45 28 38    62  4 45 19 13 51 30 36    60  6 43 21 11 53 28 38
 3 61 12 54 44 22 35 29     7 57 24 42 56 10 39 25     3 61 20 46 52 14 35 29
58  8 49 15 17 47 26 40    60  6 43 21 11 53 28 38    58  8 41 23  9 55 26 40
23 41 32 34 64  2 55  9    15 49 32 34 64  2 47 17    15 49 32 34 64  2 47 17
46 20 37 27  5 59 14 52    52 14 35 29  3 61 20 46    54 12 37 27  5 59 22 44
21 43 30 36 62  4 53 11     9 55 26 40 58  8 41 23    13 51 30 36 62  4 45 19
48 18 39 25  7 57 16 50    54 12 37 27  5 59 22 44    56 10 39 25  7 57 24 42

[Count = 90]

** Monitor List of Solution Correspondences between Old List and New **
 ??: 0
  1: 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
 31: 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
 61: 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
* OK!
```

This monitor list tells us we have surely succeeded in getting the complete set of 90 Fundamental Solutions. Neither repetition nor drop-off of any solution could be found.

## 6. How to Compose 'Composite and Pan-diagonal' Magic Squares 8x8?

For the next case, let's study about composing 'Composite and Pan-diagonal' Magic Squares of order 8 by our "New Euler's Method" by binary number system, shall we?

I usually use the two words 'Complete' and 'Pan-diagonal' in different meanings. Basic equations of definition are partially different from each other.

**[Basic Positions]**

```
61 62 63 64 57 58 59 60 61 62 63 64 57 58 59 60
            .-----------------------.
n5 n6 n7 n8|n1|n2|n3|n4|n5|n6|n7|n8|n1 n2 n3 n4
            |--+--+--+--+--+--+--+--|
13 14 15 16|n9|10|11|12|13|14|15|16|n9 10 11 12
            |--+--+--+--+--+--+--+--|
21 22 23 24|17|18|19|20|21|22|23|24|17 18 19 20
            |--+--+--+--+--+--+--+--|
29 30 31 32|25|26|27|28|29|30|31|32|25 26 27 28
            |--+--+--+--+--+--+--+--|
37 38 39 40|33|34|35|36|37|38|39|40|33 34 35 36
            |--+--+--+--+--+--+--+--|
45 46 47 48|41|42|43|44|45|46|47|48|41 42 43 44
            |--+--+--+--+--+--+--+--|
53 54 55 56|49|50|51|52|53|54|55|56|49 50 51 52
            |--+--+--+--+--+--+--+--|
61 62 63 64|57|58|59|60|61|62|63|64|57 58 59 60
            '-----------------------'
n5 n6 n7 n8 n1 n2 n3 n4 n5 n6 n7 n8 n1 n2 n3 n4
```

**** 'Composite Conditions': ****

```
n1+n2+n9+n10=2;
n2+n3+n10+n11=2;
n3+n4+n11+n12=2;
n4+n5+n12+n13=2;
n5+n6+n13+n14=2;
n6+n7+n14+n15=2;
n7+n8+n15+n16=2;
n8+n1+n16+n9=2;
n9+n10+n17+n18=2;
n10+n11+n18+n19=2;
n11+n12+n19+n20=2;
n12+n13+n20+n21=2;
n13+n14+n21+n22=2;
n14+n15+n22+n23=2;
n15+n16+n23+n24=2;
n16+n9+n24+n17=2;
n17+n18+n25+n26=2;
n18+n19+n26+n27=2;
n19+n20+n27+n28=2;
n20+n21+n28+n29=2;
```

```
    n21+n22+n29+n30=2;   n22+n23+n30+n31=2;   n23+n24+n31+n32=2;
    n24+n17+n32+n25=2;   n25+n26+n33+n34=2;   n26+n27+n34+n35=2;
    n27+n28+n35+n36=2;   n28+n29+n36+n37=2;   n29+n30+n37+n38=2;
    n30+n31+n38+n39=2;   n31+n32+n39+n40=2;   n32+n25+n40+n33=2;   . . . . . .

  ** Every row, every column and every pan-diagonal **
  **  must add up to the same Magic Constant: 4 **
  n1+n2+n3+n4+n5+n6+n7+n8=4;          n1+n9+n17+n25+n33+n41+n49+n57=4;
  n9+n10+n11+n12+n13+n14+n15+n16=4;   n2+n10+n18+n26+n34+n42+n50+n58=4;
  n17+n18+n19+n20+n21+n22+n23+n24=4;  n3+n11+n19+n27+n35+n43+n51+n59=4;
  n25+n26+n27+n28+n29+n30+n31+n32=4;  n4+n12+n20+n28+n36+n44+n52+n60=4;
  n33+n34+n35+n36+n37+n38+n39+n40=4;  n5+n13+n21+n29+n37+n45+n53+n61=4;
  n41+n42+n43+n44+n45+n46+n47+n48=4;  n6+n14+n22+n30+n38+n46+n54+n62=4;
  n49+n50+n51+n52+n53+n54+n55+n56=4;  n7+n15+n23+n31+n39+n47+n55+n63=4;
  n57+n58+n59+n60+n61+n62+n63+n64=4;  n8+n16+n24+n32+n40+n48+n56+n64=4;

  ** Pan-diagonal Conditions: **
  n1+n10+n19+n28+n37+n46+n55+n64=4;   n1+n16+n23+n30+n37+n44+n51+n58=4;
  n2+n11+n20+n29+n38+n47+n56+n57=4;   n2+n9+n24+n31+n38+n45+n52+n59=4;
  n3+n12+n21+n30+n39+n48+n49+n58=4;   n3+n10+n17+n32+n39+n46+n53+n60=4;
  n4+n13+n22+n31+n40+n41+n50+n59=4;   n4+n11+n18+n25+n40+n47+n54+n61=4;
  n5+n14+n23+n32+n33+n42+n51+n60=4;   n5+n12+n19+n26+n33+n48+n55+n62=4;
  n6+n15+n24+n25+n34+n43+n52+n61=4;   n6+n13+n20+n27+n34+n41+n56+n63=4;
  n7+n16+n17+n26+n35+n44+n53+n62=4;   n7+n14+n21+n28+n35+n42+n49+n64=4;
  n8+n9+n18+n27+n36+n45+n54+n63=4;    n8+n15+n22+n29+n36+n43+n50+n57=4;
```

'Pan-diagonal' type has to be made only under the basic conditions above, while 'Complete' type has to be composed with both the next 'Complete Conditions' and the basic ones above at the same time.

```
 ** [Complete Conditions](We don't use this time) **
 ** Complementary Pairs must be located as follows: **
   n1+n37=1;   n2+n38=1;   n3+n39=1;   n4+n40=1;   n5+n33=1;
   n6+n34=1;   n7+n35=1;   n8+n36=1;   n9+n45=1;   n10+n46=1;
   n11+n47=1;  n12+n48=1;  n13+n41=1;  n14+n42=1;  n15+n43=1;
   n16+n44=1;  n17+n53=1;  n18+n54=1;  n19+n55=1;  n20+n56=1;
   n21+n49=1;  n22+n50=1;  n23+n51=1;  n24+n52=1;  n25+n61=1;
   n26+n62=1;  n27+n63=1;  n28+n64=1;  n29+n57=1;  n30+n58=1;
   n31+n59=1;  n32+n60=1;
```

Now that we are going to make the 'Composite & Pan-diagonal' MS88, we don't use these 'Complete Conditions' here. Therefore it is supposed that we will have the larger set of solutions than the one of 'Composite & Complete' MS88.

### 6-1. Make Latin Squares

Let me show you part of my newest program for 'C&P' MS88.

As I defined every value of n1~n64 individually in each procedure, I had to write a simple but a long text.

```
/** 'Composite & Pandiagonal' Magic Squares of Order 8 **/
/** by 'New Euler's Method' with Binary Decompositions **/
/** 'CES8CPD.c' built by Kanji Setsuda **/
/** on Sep. 14, 2003; Mar. 23, 2006 **/
/** Working on MacOSX and Xcode 2.1 **/
/**/
#include <stdio.h>
/**/
long int cnt, cnt2, cntr;
short SSM;
short nm[65], flg[65], unm[7];
char mtc[73][73];
```

```
char tlu[73][65];
/**/
short rw1[2], cl1[2], pd1[2], pb1[2];
short rw2[2], cl2[2], pd2[2], pb2[2];
short rw3[2], cl3[2], pd3[2], pb3[2];
short rw4[2], cl4[2], pd4[2], pb4[2];
short rw5[2], cl5[2], pd5[2], pb5[2];
short rw6[2], cl6[2], pd6[2], pb6[2];
short rw7[2], cl7[2], pd7[2], pb7[2];
short rw8[2], cl8[2], pd8[2], pb8[2];
/**/
/* . . . . . . . */
/**/
int main(){
 short n;
  printf("\n** 'Composite & Pandiagonal' Magic Squares of Order 8 **\n");
  printf("** by 'New Euler's Method' with Binary Decompositions **\n");
  for(n=0;n<65;n++){nm[n]=0;}
  for(n=0;n<2;n++){
    rw1[n]=0; cl1[n]=0; pd1[n]=0; pb1[n]=0;
    rw2[n]=0; cl2[n]=0; pd2[n]=0; pb2[n]=0;
    rw3[n]=0; cl3[n]=0; pd3[n]=0; pb3[n]=0;
    rw4[n]=0; cl4[n]=0; pd4[n]=0; pb4[n]=0;
    rw5[n]=0; cl5[n]=0; pd5[n]=0; pb5[n]=0;
    rw6[n]=0; cl6[n]=0; pd6[n]=0; pb6[n]=0;
    rw7[n]=0; cl7[n]=0; pd7[n]=0; pb7[n]=0;
    rw8[n]=0; cl8[n]=0; pd8[n]=0; pb8[n]=0;
  }
  SSM=2; cnt=0;
  stp01();
  printf(" [Count = %d]\n",cnt);
  printf("\n[Latin Squares of Binary Decompositions]\n");
  prlunit();
  printf("['Composite & Pandiagonal' MS88: Used Units////S.Number#]\n");
  cnt=0;
  cmbcmp();
  printf(" [Count = %d]  OK!\n",cnt);
 return 0;
}
/* Begin The Search */
/* Set n1 */
void stp01(){
 short a;
  for(a=0;a<2;a++){
    if((rw1[a]<4)&&(cl1[a]<4)&&(pd1[a]<4)&&(pb1[a]<4)){
      nm[1]=a;
      rw1[a]++; cl1[a]++; pd1[a]++; pb1[a]++;
      stp02();
      rw1[a]--; cl1[a]--; pd1[a]--; pb1[a]--;
  }}
}
/* Set n2 */
void stp02(){
 short a;
  for(a=1;a>=0;a--){
    if((rw1[a]<4)&&(cl2[a]<4)&&(pd2[a]<4)&&(pb2[a]<4)){
        nm[2]=a;
        rw1[a]++; cl2[a]++; pd2[a]++; pb2[a]++;
        stp03();
        rw1[a]--; cl2[a]--; pd2[a]--; pb2[a]--;
  }}
}
/* Set n3 */
void stp03(){
```

```
 short a;
  for(a=0;a<2;a++){
    if((rw1[a]<4)&&(cl3[a]<4)&&(pd3[a]<4)&&(pb3[a]<4)){
         nm[3]=a;
         rw1[a]++; cl3[a]++; pd3[a]++; pb3[a]++;
         stp04();
         rw1[a]--; cl3[a]--; pd3[a]--; pb3[a]--;
  }}
}
/* Set n4 & n40 */
void stp04(){
 short a;
  for(a=1;a>=0;a--){
    if((rw1[a]<4)&&(cl4[a]<4)&&(pd4[a]<4)&&(pb4[a]<4)){
         nm[4]=a;
         rw1[a]++; cl4[a]++; pd4[a]++; pb4[a]++;
         stp05();
         rw1[a]--; cl4[a]--; pd4[a]--; pb4[a]--;
  }}
}
/* Set n8 */
void stp05(){
 short a;
  for(a=1;a>=0;a--){
    if((rw1[a]<4)&&(cl8[a]<4)&&(pd8[a]<4)&&(pb8[a]<4)){
         nm[8]=a;
         rw1[a]++; cl8[a]++; pd8[a]++; pb8[a]++;
         stp06();
         rw1[a]--; cl8[a]--; pd8[a]--; pb8[a]--;
  }}
}
/* Set n7 */
void stp06(){
 short a;
  for(a=0;a<2;a++){
    if((rw1[a]<4)&&(cl7[a]<4)&&(pd7[a]<4)&&(pb7[a]<4)){
         nm[7]=a;
         rw1[a]++; cl7[a]++; pd7[a]++; pb7[a]++;
         stp07();
         rw1[a]--; cl7[a]--; pd7[a]--; pb7[a]--;
  }}
}
/* Set n6 */
void stp07(){
 short a;
  for(a=1;a>=0;a--){
    if((rw1[a]<4)&&(cl6[a]<4)&&(pd6[a]<4)&&(pb6[a]<4)){
         nm[6]=a;
         rw1[a]++; cl6[a]++; pd6[a]++; pb6[a]++;
         stp08();
         rw1[a]--; cl6[a]--; pd6[a]--; pb6[a]--;
  }}
}
/* Set n5 */
void stp08(){
 short a;
  for(a=0;a<2;a++){
    if((rw1[a]<4)&&(cl5[a]<4)&&(pd5[a]<4)&&(pb5[a]<4)){
         nm[5]=a;
         rw1[a]++; cl5[a]++; pd5[a]++; pb5[a]++;
         stp09();
         rw1[a]--; cl5[a]--; pd5[a]--; pb5[a]--;
  }}
}
```

```
/* Set n9 */
void stp09(){
 short a;
  for(a=1;a>=0;a--){
    if((rw2[a]<4)&&(cl1[a]<4)&&(pd8[a]<4)&&(pb2[a]<4)){
         nm[9]=a;
         rw2[a]++; cl1[a]++; pd8[a]++; pb2[a]++;
         stp10();
         rw2[a]--; cl1[a]--; pd8[a]--; pb2[a]--;
  }}
}
/* Set n10 & n1+n2+n9+n10=SSM */
void stp10(){
 short a;
  for(a=0;a<2;a++){
    if((rw2[a]<4)&&(cl2[a]<4)&&(pd1[a]<4)&&(pb3[a]<4)){
      if(nm[1]+nm[2]+nm[9]+a==SSM){nm[10]=a;
         rw2[a]++; cl2[a]++; pd1[a]++; pb3[a]++;
         stp11();
         rw2[a]--; cl2[a]--; pd1[a]--; pb3[a]--;
  }}}
}
/* Set n11 & n2+n3+n10+n11=SSM */
void stp11(){
 short a;
  for(a=1;a>=0;a--){
    if((rw2[a]<4)&&(cl3[a]<4)&&(pd2[a]<4)&&(pb4[a]<4)){
      if(nm[2]+nm[3]+nm[10]+a==SSM){nm[11]=a;
         rw2[a]++; cl3[a]++; pd2[a]++; pb4[a]++;
         stp12();
         rw2[a]--; cl3[a]--; pd2[a]--; pb4[a]--;
  }}}
}
/* Set n12 & n3+n4+n11+n12=SSM */
void stp12(){
 short a;
  for(a=0;a<2;a++){
    if((rw2[a]<4)&&(cl4[a]<4)&&(pd3[a]<4)&&(pb5[a]<4)){
      if(nm[3]+nm[4]+nm[11]+a==SSM){nm[12]=a;
         rw2[a]++; cl4[a]++; pd3[a]++; pb5[a]++;
         stp13();
         rw2[a]--; cl4[a]--; pd3[a]--; pb5[a]--;
  }}}
}
/* Set n13 & n4+n5+n12+n13=SSM */
void stp13(){
 short b;
  for(b=1;b>=0;b--){
    if((rw2[b]<4)&&(cl5[b]<4)&&(pd4[b]<4)&&(pb6[b]<4)){
      if(nm[4]+nm[5]+nm[12]+b==SSM){nm[13]=b;
         rw2[b]++; cl5[b]++; pd4[b]++; pb6[b]++;
         stp14();
         rw2[b]--; cl5[b]--; pd4[b]--; pb6[b]--;
  }}}
}
/* Set n14 & n5+n6+n13+n14=SSM */
void stp14(){
 short a;
  for(a=0;a<2;a++){
    if((rw2[a]<4)&&(cl6[a]<4)&&(pd5[a]<4)&&(pb7[a]<4)){
      if(nm[5]+nm[6]+nm[13]+a==SSM){nm[14]=a;
         rw2[a]++; cl6[a]++; pd5[a]++; pb7[a]++;
         stp15();
         rw2[a]--; cl6[a]--; pd5[a]--; pb7[a]--;
```

```
  }}}
}
/* Set n15 & n6+n7+n14+n15=SSM */
void stp15(){
 short a;
  for(a=0;a<2;a++){
    if((rw2[a]<4)&&(cl7[a]<4)&&(pd6[a]<4)&&(pb8[a]<4)){
      if(nm[6]+nm[7]+nm[14]+a==SSM){nm[15]=a;
        rw2[a]++; cl7[a]++; pd6[a]++; pb8[a]++;
        stp16();
        rw2[a]--; cl7[a]--; pd6[a]--; pb8[a]--;
  }}}
}
/* Set n16 & n7+n8+n15+n16=SSM & n8+n1+n16+n9=SSM */
void stp16(){
 short a;
  for(a=0;a<2;a++){
    if((rw2[a]<4)&&(cl8[a]<4)&&(pd7[a]<4)&&(pb1[a]<4)){
      if((nm[7]+nm[8]+nm[15]+a==SSM)&&(nm[8]+nm[1]+a+nm[9]==SSM)){
        nm[16]=a;
        rw2[a]++; cl8[a]++; pd7[a]++; pb1[a]++;
        stp17();
        rw2[a]--; cl8[a]--; pd7[a]--; pb1[a]--;
  }}}
}
/* Search Level 2 */
/* Set n17 */
void stp17(){
 short a;
  for(a=0;a<2;a++){
    if((rw3[a]<4)&&(cl1[a]<4)&&(pd7[a]<4)&&(pb3[a]<4)){
        nm[17]=a;
        rw3[a]++; cl1[a]++; pd7[a]++; pb3[a]++;
        stp18();
        rw3[a]--; cl1[a]--; pd7[a]--; pb3[a]--;
  }}
}
/* Set n18 & n9+n10+n17+n18=SSM */
void stp18(){
 short a;
  for(a=0;a<2;a++){
    if((rw3[a]<4)&&(cl2[a]<4)&&(pd8[a]<4)&&(pb4[a]<4)){
      if(nm[9]+nm[10]+nm[17]+a==SSM){nm[18]=a;
        rw3[a]++; cl2[a]++; pd8[a]++; pb4[a]++;
        stp19();
        rw3[a]--; cl2[a]--; pd8[a]--; pb4[a]--;
  }}}
}
/* Set n19 & n10+n11+n18+n19=SSM */
void stp19(){
 short a;
  for(a=0;a<2;a++){
    if((rw3[a]<4)&&(cl3[a]<4)&&(pd1[a]<4)&&(pb5[a]<4)){
      if(nm[10]+nm[11]+nm[18]+a==SSM){nm[19]=a;
        rw3[a]++; cl3[a]++; pd1[a]++; pb5[a]++;
        stp20();
        rw3[a]--; cl3[a]--; pd1[a]--; pb5[a]--;
  }}}
}
/**/
/* . . . . . . */
```

The next list shows all of Latin Squares I have got as many as 72.
Woo! Do we have to examine all cases combined and composed as many as about

36*35*34*33*32*31*26 (=89754255360) ?

[Latin Squares of Binary Decompositions]

| 1/ | 2/ | 3/ | 4/ | 5/ | 6/ | 7/ | 8/ | 9/ |
|---|---|---|---|---|---|---|---|---|
| 01010101 | 01010101 | 01010101 | 01010101 | 01010101 | 01010101 | 01010101 | 01010101 | 01010101 |
| 10101010 | 10101010 | 10101010 | 10101010 | 10101010 | 10101010 | 10101010 | 10101010 | 10101010 |
| 01010101 | 01010101 | 01010101 | 10101010 | 10101010 | 10101010 | 10101010 | 10101010 | 10101010 |
| 10101010 | 01010101 | 01010101 | 10101010 | 10101010 | 01010101 | 01010101 | 01010101 | 01010101 |
| 10101010 | 10101010 | 10101010 | 10101010 | 01010101 | 10101010 | 10101010 | 01010101 | 01010101 |
| 01010101 | 10101010 | 01010101 | 01010101 | 01010101 | 10101010 | 01010101 | 10101010 | 01010101 |
| 10101010 | 10101010 | 10101010 | 01010101 | 10101010 | 01010101 | 01010101 | 10101010 | 10101010 |
| 01010101 | 01010101 | 10101010 | 01010101 | 01010101 | 01010101 | 10101010 | 01010101 | 10101010 |

| 10/ | 11/ | 12/ | 13/ | 14/ | 15/ | 16/ | 17/ | 18/ |
|---|---|---|---|---|---|---|---|---|
| 01010101 | 01010101 | 01010101 | 01010101 | 01010101 | 01010101 | 01010101 | 01010101 | 01010101 |
| 01010101 | 01010101 | 01010101 | 01010101 | 01010101 | 01010101 | 01010101 | 01010101 | 01010101 |
| 01010101 | 01010101 | 01010101 | 10101010 | 10101010 | 10101010 | 10101010 | 10101010 | 10101010 |
| 10101010 | 10101010 | 01010101 | 10101010 | 10101010 | 10101010 | 10101010 | 01010101 | 01010101 |
| 10101010 | 10101010 | 10101010 | 10101010 | 10101010 | 01010101 | 01010101 | 10101010 | 01010101 |
| 10101010 | 01010101 | 10101010 | 10101010 | 01010101 | 10101010 | 01010101 | 10101010 | 10101010 |
| 10101010 | 10101010 | 10101010 | 01010101 | 01010101 | 10101010 | 10101010 | 01010101 | 10101010 |
| 01010101 | 10101010 | 10101010 | 01010101 | 10101010 | 01010101 | 10101010 | 10101010 | 10101010 |

| 19/ | 20/ | 21/ | 22/ | 23/ | 24/ | 25/ | 26/ | 27/ |
|---|---|---|---|---|---|---|---|---|
| 01011010 | 01001011 | 01001110 | 01111000 | 01110010 | 01101001 | 01100011 | 01101100 | 01100110 |
| 10100101 | 10110100 | 10110001 | 10000111 | 10001101 | 10010110 | 10011100 | 10010011 | 10011001 |
| 01011010 | 01001011 | 01001110 | 01111000 | 01110010 | 01101001 | 01100011 | 01101100 | 01100110 |
| 10100101 | 10110100 | 10110001 | 10000111 | 10001101 | 10010110 | 10011100 | 10010011 | 10011001 |
| 01011010 | 01001011 | 01001110 | 01111000 | 01110010 | 01101001 | 01100011 | 01101100 | 01100110 |
| 10100101 | 10110100 | 10110001 | 10000111 | 10001101 | 10010110 | 10011100 | 10010011 | 10011001 |
| 01011010 | 01001011 | 01001110 | 01111000 | 01110010 | 01101001 | 01100011 | 01101100 | 01100110 |
| 10100101 | 10110100 | 10110001 | 10000111 | 10001101 | 10010110 | 10011100 | 10010011 | 10011001 |

| 28/ | 29/ | 30/ | 31/ | 32/ | 33/ | 34/ | 35/ | 36/ |
|---|---|---|---|---|---|---|---|---|
| 00011011 | 00011110 | 00001111 | 00111001 | 00110011 | 00111100 | 00110110 | 00101101 | 00100111 |
| 11100100 | 11100001 | 11110000 | 11000110 | 11001100 | 11000011 | 11001001 | 11010010 | 11011000 |
| 00011011 | 00011110 | 00001111 | 00111001 | 00110011 | 00111100 | 00110110 | 00101101 | 00100111 |
| 11100100 | 11100001 | 11110000 | 11000110 | 11001100 | 11000011 | 11001001 | 11010010 | 11011000 |
| 00011011 | 00011110 | 00001111 | 00111001 | 00110011 | 00111100 | 00110110 | 00101101 | 00100111 |
| 11100100 | 11100001 | 11110000 | 11000110 | 11001100 | 11000011 | 11001001 | 11010010 | 11011000 |
| 00011011 | 00011110 | 00001111 | 00111001 | 00110011 | 00111100 | 00110110 | 00101101 | 00100111 |
| 11100100 | 11100001 | 11110000 | 11000110 | 11001100 | 11000011 | 11001001 | 11010010 | 11011000 |

| 37/ | 38/ | 39/ | 40/ | 41/ | 42/ | 43/ | 44/ | 45/ |
|---|---|---|---|---|---|---|---|---|
| 11011000 | 11010010 | 11001001 | 11000011 | 11001100 | 11000110 | 11110000 | 11100001 | 11100100 |
| 00100111 | 00101101 | 00110110 | 00111100 | 00110011 | 00111001 | 00001111 | 00011110 | 00011011 |
| 11011000 | 11010010 | 11001001 | 11000011 | 11001100 | 11000110 | 11110000 | 11100001 | 11100100 |
| 00100111 | 00101101 | 00110110 | 00111100 | 00110011 | 00111001 | 00001111 | 00011110 | 00011011 |
| 11011000 | 11010010 | 11001001 | 11000011 | 11001100 | 11000110 | 11110000 | 11100001 | 11100100 |
| 00100111 | 00101101 | 00110110 | 00111100 | 00110011 | 00111001 | 00001111 | 00011110 | 00011011 |
| 11011000 | 11010010 | 11001001 | 11000011 | 11001100 | 11000110 | 11110000 | 11100001 | 11100100 |
| 00100111 | 00101101 | 00110110 | 00111100 | 00110011 | 00111001 | 00001111 | 00011110 | 00011011 |

| 46/ | 47/ | 48/ | 49/ | 50/ | 51/ | 52/ | 53/ | 54/ |
|---|---|---|---|---|---|---|---|---|
| 10011001 | 10010011 | 10011100 | 10010110 | 10001101 | 10000111 | 10110001 | 10110100 | 10100101 |
| 01100110 | 01101100 | 01100011 | 01101001 | 01110010 | 01111000 | 01001110 | 01001011 | 01011010 |
| 10011001 | 10010011 | 10011100 | 10010110 | 10001101 | 10000111 | 10110001 | 10110100 | 10100101 |
| 01100110 | 01101100 | 01100011 | 01101001 | 01110010 | 01111000 | 01001110 | 01001011 | 01011010 |
| 10011001 | 10010011 | 10011100 | 10010110 | 10001101 | 10000111 | 10110001 | 10110100 | 10100101 |
| 01100110 | 01101100 | 01100011 | 01101001 | 01110010 | 01111000 | 01001110 | 01001011 | 01011010 |
| 10011001 | 10010011 | 10011100 | 10010110 | 10001101 | 10000111 | 10110001 | 10110100 | 10100101 |
| 01100110 | 01101100 | 01100011 | 01101001 | 01110010 | 01111000 | 01001110 | 01001011 | 01011010 |

```
     55/      56/      57/      58/      59/      60/      61/      62/      63/
10101010 10101010 10101010 10101010 10101010 10101010 10101010 10101010 10101010
10101010 10101010 10101010 10101010 10101010 10101010 10101010 10101010 10101010
01010101 01010101 01010101 01010101 01010101 01010101 10101010 10101010 10101010
10101010 10101010 01010101 01010101 01010101 01010101 10101010 01010101 01010101
10101010 01010101 10101010 10101010 01010101 01010101 01010101 01010101 01010101
01010101 01010101 10101010 01010101 10101010 01010101 01010101 10101010 01010101
01010101 10101010 01010101 01010101 10101010 10101010 01010101 01010101 01010101
01010101 01010101 01010101 10101010 01010101 10101010 01010101 01010101 10101010
     64/      65/      66/      67/      68/      69/      70/      71/      72/
10101010 10101010 10101010 10101010 10101010 10101010 10101010 10101010 10101010
01010101 01010101 01010101 01010101 01010101 01010101 01010101 01010101 01010101
01010101 01010101 01010101 01010101 01010101 01010101 10101010 10101010 10101010
10101010 10101010 10101010 10101010 01010101 01010101 10101010 10101010 01010101
10101010 10101010 01010101 01010101 10101010 01010101 01010101 01010101 01010101
10101010 01010101 10101010 01010101 10101010 10101010 10101010 01010101 10101010
01010101 01010101 10101010 10101010 01010101 10101010 01010101 01010101 01010101
01010101 10101010 01010101 10101010 10101010 10101010 01010101 10101010 10101010
```

### 6-2. Combine 6 Latin Squares to Compose each Solution

(1) Make the reference table on mtc[73][73] where every data is recorded about how many digits are the same between any two units picked up.

(2) Combine 6 units chosen and assume 6 layers of binary decompositions. But consult any unit pair with the reference table in advance to know the value of that pair is equal to 32. If it is true, you may calculate and compose each solution.

(3) Examine if your answer is against the Def (3) of C.E.S. or not. When it is all right, test it under the list forming conditions, and at last you can get what you want.

Let me show you part of my recent result as follows:

```
['Composite & Pandiagonal' MS88: Used Units////// Sol_Number#]
      1/       6/       9/      12/      19/      24/                         1#
01010101 01010101 01010101 01010101 01011010 01101001   1 64  2 63  4 61  3 62
10101010 10101010 10101010 01010101 10100101 10010110  60  5 59  6 57  8 58  7
01010101 10101010 10101010 01010101 01011010 01101001  25 40 26 39 28 37 27 38
10101010 01010101 01010101 01010101 10100101 10010110  36 29 35 30 33 32 34 31
10101010 10101010 01010101 10101010 01011010 01101001  53 12 54 11 56  9 55 10
01010101 10101010 01010101 10101010 10100101 10010110  24 41 23 42 21 44 22 43
10101010 01010101 10101010 10101010 01011010 01101001  45 20 46 19 48 17 47 18
01010101 01010101 10101010 10101010 10100101 10010110  16 49 15 50 13 52 14 51
      1/       7/       8/      12/      19/      24/                     61057#
01010101 01010101 01010101 01010101 01011010 01101001   1 64  2 63  4 61  3 62
10101010 10101010 10101010 01010101 10100101 10010110  60  5 59  6 57  8 58  7
01010101 10101010 10101010 01010101 01011010 01101001  25 40 26 39 28 37 27 38
10101010 01010101 01010101 01010101 10100101 10010110  36 29 35 30 33 32 34 31
10101010 10101010 01010101 10101010 01011010 01101001  53 12 54 11 56  9 55 10
01010101 01010101 10101010 10101010 10100101 10010110  16 49 15 50 13 52 14 51
10101010 01010101 10101010 10101010 01011010 01101001  45 20 46 19 48 17 47 18
01010101 10101010 01010101 10101010 10100101 10010110  24 41 23 42 21 44 22 43
      1/       8/       7/      12/      19/      24/                    208513#
01010101 01010101 01010101 01010101 01011010 01101001   1 64  2 63  4 61  3 62
10101010 10101010 10101010 01010101 10100101 10010110  60  5 59  6 57  8 58  7
01010101 10101010 10101010 01010101 01011010 01101001  25 40 26 39 28 37 27 38
10101010 01010101 01010101 01010101 10100101 10010110  36 29 35 30 33 32 34 31
10101010 01010101 10101010 10101010 01011010 01101001  45 20 46 19 48 17 47 18
01010101 10101010 01010101 10101010 10100101 10010110  24 41 23 42 21 44 22 43
10101010 10101010 01010101 10101010 01011010 01101001  53 12 54 11 56  9 55 10
01010101 01010101 10101010 10101010 10100101 10010110  16 49 15 50 13 52 14 51
```

| 1/ | 9/ | 6/ | 12/ | 19/ | 24/ | | | | | | | | 269569# |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01010101 | 01010101 | 01010101 | 01010101 | 01011010 | 01101001 | 1 | 64 | 2 | 63 | 4 | 61 | 3 | 62 |
| 10101010 | 10101010 | 10101010 | 01010101 | 10100101 | 10010110 | 60 | 5 | 59 | 6 | 57 | 8 | 58 | 7 |
| 01010101 | 10101010 | 10101010 | 01010101 | 01011010 | 01101001 | 25 | 40 | 26 | 39 | 28 | 37 | 27 | 38 |
| 10101010 | 01010101 | 01010101 | 01010101 | 10100101 | 10010110 | 36 | 29 | 35 | 30 | 33 | 32 | 34 | 31 |
| 10101010 | 01010101 | 10101010 | 10101010 | 01011010 | 01101001 | 45 | 20 | 46 | 19 | 48 | 17 | 47 | 18 |
| 01010101 | 01010101 | 10101010 | 10101010 | 10100101 | 10010110 | 16 | 49 | 15 | 50 | 13 | 52 | 14 | 51 |
| 10101010 | 10101010 | 01010101 | 10101010 | 01011010 | 01101001 | 53 | 12 | 54 | 11 | 56 | 9 | 55 | 10 |
| 01010101 | 10101010 | 01010101 | 10101010 | 10100101 | 10010110 | 24 | 41 | 23 | 42 | 21 | 44 | 22 | 43 |

| 1/ | 12/ | 6/ | 9/ | 19/ | 24/ | | | | | | | | 417025# |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01010101 | 01010101 | 01010101 | 01010101 | 01011010 | 01101001 | 1 | 64 | 2 | 63 | 4 | 61 | 3 | 62 |
| 10101010 | 01010101 | 10101010 | 10101010 | 10100101 | 10010110 | 48 | 17 | 47 | 18 | 45 | 20 | 46 | 19 |
| 01010101 | 01010101 | 10101010 | 10101010 | 01011010 | 01101001 | 13 | 52 | 14 | 51 | 16 | 49 | 15 | 50 |
| 10101010 | 01010101 | 01010101 | 01010101 | 10100101 | 10010110 | 36 | 29 | 35 | 30 | 33 | 32 | 34 | 31 |
| 10101010 | 10101010 | 10101010 | 01010101 | 01011010 | 01101001 | 57 | 8 | 58 | 7 | 60 | 5 | 59 | 6 |
| 01010101 | 10101010 | 10101010 | 01010101 | 10100101 | 10010110 | 28 | 37 | 27 | 38 | 25 | 40 | 26 | 39 |
| 10101010 | 10101010 | 01010101 | 10101010 | 01011010 | 01101001 | 53 | 12 | 54 | 11 | 56 | 9 | 55 | 10 |
| 01010101 | 10101010 | 01010101 | 10101010 | 10100101 | 10010110 | 24 | 41 | 23 | 42 | 21 | 44 | 22 | 43 |

| 1/ | 13/ | 7/ | 8/ | 19/ | 24/ | | | | | | | | 933121# |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01010101 | 01010101 | 01010101 | 01010101 | 01011010 | 01101001 | 1 | 64 | 2 | 63 | 4 | 61 | 3 | 62 |
| 10101010 | 01010101 | 10101010 | 10101010 | 10100101 | 10010110 | 48 | 17 | 47 | 18 | 45 | 20 | 46 | 19 |
| 01010101 | 10101010 | 10101010 | 10101010 | 01011010 | 01101001 | 29 | 36 | 30 | 35 | 32 | 33 | 31 | 34 |
| 10101010 | 10101010 | 01010101 | 01010101 | 10100101 | 10010110 | 52 | 13 | 51 | 14 | 49 | 16 | 50 | 15 |
| 10101010 | 10101010 | 10101010 | 01010101 | 01011010 | 01101001 | 57 | 8 | 58 | 7 | 60 | 5 | 59 | 6 |
| 01010101 | 10101010 | 01010101 | 10101010 | 10100101 | 10010110 | 24 | 41 | 23 | 42 | 21 | 44 | 22 | 43 |
| 10101010 | 01010101 | 01010101 | 10101010 | 01011010 | 01101001 | 37 | 28 | 38 | 27 | 40 | 25 | 39 | 26 |
| 01010101 | 01010101 | 10101010 | 01010101 | 10100101 | 10010110 | 12 | 53 | 11 | 54 | 9 | 56 | 10 | 55 |

1/14/ 6/ 9/19/24/1080577#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 64 | 2 | 63 | 4 | 61 | 3 | 62 |
| 48 | 17 | 47 | 18 | 45 | 20 | 46 | 19 |
| 29 | 36 | 30 | 35 | 32 | 33 | 31 | 34 |
| 52 | 13 | 51 | 14 | 49 | 16 | 50 | 15 |
| 57 | 8 | 58 | 7 | 60 | 5 | 59 | 6 |
| 12 | 53 | 11 | 54 | 9 | 56 | 10 | 55 |
| 37 | 28 | 38 | 27 | 40 | 25 | 39 | 26 |
| 24 | 41 | 23 | 42 | 21 | 44 | 22 | 43 |

1/15/ 6/ 9/19/24/1375489#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 64 | 2 | 63 | 4 | 61 | 3 | 62 |
| 48 | 17 | 47 | 18 | 45 | 20 | 46 | 19 |
| 29 | 36 | 30 | 35 | 32 | 33 | 31 | 34 |
| 52 | 13 | 51 | 14 | 49 | 16 | 50 | 15 |
| 41 | 24 | 42 | 23 | 44 | 21 | 43 | 22 |
| 28 | 37 | 27 | 38 | 25 | 40 | 26 | 39 |
| 53 | 12 | 54 | 11 | 56 | 9 | 55 | 10 |
| 8 | 57 | 7 | 58 | 5 | 60 | 6 | 59 |

1/16/ 7/ 8/19/24/1522945#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 64 | 2 | 63 | 4 | 61 | 3 | 62 |
| 48 | 17 | 47 | 18 | 45 | 20 | 46 | 19 |
| 29 | 36 | 30 | 35 | 32 | 33 | 31 | 34 |
| 52 | 13 | 51 | 14 | 49 | 16 | 50 | 15 |
| 41 | 24 | 42 | 23 | 44 | 21 | 43 | 22 |
| 8 | 57 | 7 | 58 | 5 | 60 | 6 | 59 |
| 53 | 12 | 54 | 11 | 56 | 9 | 55 | 10 |
| 28 | 37 | 27 | 38 | 25 | 40 | 26 | 39 |

1/19/ 6/ 9/12/24/1817857#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 64 | 2 | 63 | 18 | 47 | 17 | 48 |
| 62 | 3 | 61 | 4 | 45 | 20 | 46 | 19 |
| 13 | 52 | 14 | 51 | 30 | 35 | 29 | 36 |
| 50 | 15 | 49 | 16 | 33 | 32 | 34 | 31 |
| 43 | 22 | 44 | 21 | 60 | 5 | 59 | 6 |
| 28 | 37 | 27 | 38 | 11 | 54 | 12 | 53 |
| 39 | 26 | 40 | 25 | 56 | 9 | 55 | 10 |
| 24 | 41 | 23 | 42 | 7 | 58 | 8 | 57 |

1/20/ 6/ 9/12/22/1922305#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 64 | 2 | 48 | 18 | 47 | 17 | 63 |
| 62 | 3 | 61 | 19 | 45 | 20 | 46 | 4 |
| 13 | 52 | 14 | 36 | 30 | 35 | 29 | 51 |
| 50 | 15 | 49 | 31 | 33 | 32 | 34 | 16 |
| 43 | 22 | 44 | 6 | 60 | 5 | 59 | 21 |
| 28 | 37 | 27 | 53 | 11 | 54 | 12 | 38 |
| 39 | 26 | 40 | 10 | 56 | 9 | 55 | 25 |
| 24 | 41 | 23 | 57 | 7 | 58 | 8 | 42 |

1/21/ 6/ 9/12/22/2026753#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 64 | 2 | 48 | 18 | 63 | 17 | 47 |
| 62 | 3 | 61 | 19 | 45 | 4 | 46 | 20 |
| 13 | 52 | 14 | 36 | 30 | 51 | 29 | 35 |
| 50 | 15 | 49 | 31 | 33 | 16 | 34 | 32 |
| 43 | 22 | 44 | 6 | 60 | 21 | 59 | 5 |
| 28 | 37 | 27 | 53 | 11 | 38 | 12 | 54 |
| 39 | 26 | 40 | 10 | 56 | 25 | 55 | 9 |
| 24 | 41 | 23 | 57 | 7 | 42 | 8 | 58 |

1/22/ 6/ 9/12/20/2131201#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 64 | 17 | 63 | 18 | 47 | 2 | 48 |
| 62 | 3 | 46 | 4 | 45 | 20 | 61 | 19 |
| 13 | 52 | 29 | 51 | 30 | 35 | 14 | 36 |
| 50 | 15 | 34 | 16 | 33 | 32 | 49 | 31 |
| 43 | 22 | 59 | 21 | 60 | 5 | 44 | 6 |
| 28 | 37 | 12 | 38 | 11 | 54 | 27 | 53 |
| 39 | 26 | 55 | 25 | 56 | 9 | 40 | 10 |
| 24 | 41 | 8 | 42 | 7 | 58 | 23 | 57 |

1/23/ 6/ 9/12/20/2235649#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 64 | 17 | 63 | 2 | 47 | 18 | 48 |
| 62 | 3 | 46 | 4 | 61 | 20 | 45 | 19 |
| 13 | 52 | 29 | 51 | 14 | 35 | 30 | 36 |
| 50 | 15 | 34 | 16 | 49 | 32 | 33 | 31 |
| 43 | 22 | 59 | 21 | 44 | 5 | 60 | 6 |
| 28 | 37 | 12 | 38 | 27 | 54 | 11 | 53 |
| 39 | 26 | 55 | 25 | 40 | 9 | 56 | 10 |
| 24 | 41 | 8 | 42 | 23 | 58 | 7 | 57 |

1/24/ 6/ 9/12/19/2340097#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 64 | 17 | 48 | 18 | 47 | 2 | 63 |
| 62 | 3 | 46 | 19 | 45 | 20 | 61 | 4 |
| 13 | 52 | 29 | 36 | 30 | 35 | 14 | 51 |
| 50 | 15 | 34 | 31 | 33 | 32 | 49 | 16 |
| 43 | 22 | 59 | 6 | 60 | 5 | 44 | 21 |
| 28 | 37 | 12 | 53 | 11 | 54 | 27 | 38 |
| 39 | 26 | 55 | 10 | 56 | 9 | 40 | 25 |
| 24 | 41 | 8 | 57 | 7 | 58 | 23 | 42 |

1/25/ 6/ 9/12/19/2444545#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 64 | 17 | 48 | 2 | 47 | 18 | 63 |
| 62 | 3 | 46 | 19 | 61 | 20 | 45 | 4 |
| 13 | 52 | 29 | 36 | 14 | 35 | 30 | 51 |
| 50 | 15 | 34 | 31 | 49 | 32 | 33 | 16 |
| 43 | 22 | 59 | 6 | 44 | 5 | 60 | 21 |
| 28 | 37 | 12 | 53 | 27 | 54 | 11 | 38 |
| 39 | 26 | 55 | 10 | 40 | 9 | 56 | 25 |
| 24 | 41 | 8 | 57 | 23 | 58 | 7 | 42 |

1/26/ 6/ 9/12/19/2548993#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 64 | 17 | 48 | 18 | 63 | 2 | 47 |
| 62 | 3 | 46 | 19 | 45 | 4 | 61 | 20 |
| 13 | 52 | 29 | 36 | 30 | 51 | 14 | 35 |
| 50 | 15 | 34 | 31 | 33 | 16 | 49 | 32 |
| 43 | 22 | 59 | 6 | 60 | 21 | 44 | 5 |
| 28 | 37 | 12 | 53 | 11 | 38 | 27 | 54 |
| 39 | 26 | 55 | 10 | 56 | 25 | 40 | 9 |
| 24 | 41 | 8 | 57 | 7 | 42 | 23 | 58 |

1/27/ 6/ 9/12/19/2653441#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 64 | 17 | 48 | 2 | 63 | 18 | 47 |
| 62 | 3 | 46 | 19 | 61 | 4 | 45 | 20 |
| 13 | 52 | 29 | 36 | 14 | 51 | 30 | 35 |
| 50 | 15 | 34 | 31 | 49 | 16 | 33 | 32 |
| 43 | 22 | 59 | 6 | 44 | 21 | 60 | 5 |
| 28 | 37 | 12 | 53 | 27 | 38 | 11 | 54 |
| 39 | 26 | 55 | 10 | 40 | 25 | 56 | 9 |
| 24 | 41 | 8 | 57 | 23 | 42 | 7 | 58 |

1/65/ 7/12/19/24/2757889#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 17 | 48 | 18 | 47 | 20 | 45 | 19 | 46 |
| 44 | 21 | 43 | 22 | 41 | 24 | 42 | 23 |
| 9 | 56 | 10 | 55 | 12 | 53 | 11 | 54 |
| 52 | 13 | 51 | 14 | 49 | 16 | 50 | 15 |
| 61 | 4 | 62 | 3 | 64 | 1 | 63 | 2 |
| 8 | 57 | 7 | 58 | 5 | 60 | 6 | 59 |
| 37 | 28 | 38 | 27 | 40 | 25 | 39 | 26 |
| 32 | 33 | 31 | 34 | 29 | 36 | 30 | 35 |

1/67/ 9/12/19/24/2818945#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 17 | 48 | 18 | 47 | 20 | 45 | 19 | 46 |
| 44 | 21 | 43 | 22 | 41 | 24 | 42 | 23 |
| 9 | 56 | 10 | 55 | 12 | 53 | 11 | 54 |
| 52 | 13 | 51 | 14 | 49 | 16 | 50 | 15 |
| 37 | 28 | 38 | 27 | 40 | 25 | 39 | 26 |
| 8 | 57 | 7 | 58 | 5 | 60 | 6 | 59 |
| 61 | 4 | 62 | 3 | 64 | 1 | 63 | 2 |
| 32 | 33 | 31 | 34 | 29 | 36 | 30 | 35 |

2/ 4/ 9/11/19/24/2880001#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 64 | 2 | 63 | 4 | 61 | 3 | 62 |
| 60 | 5 | 59 | 6 | 57 | 8 | 58 | 7 |
| 25 | 40 | 26 | 39 | 28 | 37 | 27 | 38 |
| 24 | 41 | 23 | 42 | 21 | 44 | 22 | 43 |
| 53 | 12 | 54 | 11 | 56 | 9 | 55 | 10 |
| 36 | 29 | 35 | 30 | 33 | 32 | 34 | 31 |
| 45 | 20 | 46 | 19 | 48 | 17 | 47 | 18 |
| 16 | 49 | 15 | 50 | 13 | 52 | 14 | 51 |

2/69/ 9/11/19/24/5698945#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 17 | 48 | 18 | 47 | 20 | 45 | 19 | 46 |
| 44 | 21 | 43 | 22 | 41 | 24 | 42 | 23 |
| 9 | 56 | 10 | 55 | 12 | 53 | 11 | 54 |
| 8 | 57 | 7 | 58 | 5 | 60 | 6 | 59 |
| 37 | 28 | 38 | 27 | 40 | 25 | 39 | 26 |
| 52 | 13 | 51 | 14 | 49 | 16 | 50 | 15 |
| 61 | 4 | 62 | 3 | 64 | 1 | 63 | 2 |
| 32 | 33 | 31 | 34 | 29 | 36 | 30 | 35 |

3/ 4/ 8/10/19/24/5760001#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 64 | 2 | 63 | 4 | 61 | 3 | 62 |
| 60 | 5 | 59 | 6 | 57 | 8 | 58 | 7 |
| 25 | 40 | 26 | 39 | 28 | 37 | 27 | 38 |
| 24 | 41 | 23 | 42 | 21 | 44 | 22 | 43 |
| 53 | 12 | 54 | 11 | 56 | 9 | 55 | 10 |
| 16 | 49 | 15 | 50 | 13 | 52 | 14 | 51 |
| 45 | 20 | 46 | 19 | 48 | 17 | 47 | 18 |
| 36 | 29 | 35 | 30 | 33 | 32 | 34 | 31 |

3/ 5/ 6/10/19/24/5907457#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 64 | 2 | 63 | 4 | 61 | 3 | 62 |
| 60 | 5 | 59 | 6 | 57 | 8 | 58 | 7 |
| 25 | 40 | 26 | 39 | 28 | 37 | 27 | 38 |
| 24 | 41 | 23 | 42 | 21 | 44 | 22 | 43 |
| 45 | 20 | 46 | 19 | 48 | 17 | 47 | 18 |
| 16 | 49 | 15 | 50 | 13 | 52 | 14 | 51 |
| 53 | 12 | 54 | 11 | 56 | 9 | 55 | 10 |
| 36 | 29 | 35 | 30 | 33 | 32 | 34 | 31 |

4/ 2/ 9/11/19/24/9022465#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 64 | 2 | 63 | 4 | 61 | 3 | 62 |
| 60 | 5 | 59 | 6 | 57 | 8 | 58 | 7 |
| 41 | 24 | 42 | 23 | 44 | 21 | 43 | 22 |
| 40 | 25 | 39 | 26 | 37 | 28 | 38 | 27 |
| 53 | 12 | 54 | 11 | 56 | 9 | 55 | 10 |
| 20 | 45 | 19 | 46 | 17 | 48 | 18 | 47 |
| 29 | 36 | 30 | 35 | 32 | 33 | 31 | 34 |
| 16 | 49 | 15 | 50 | 13 | 52 | 14 | 51 |

5/ 2/ 7/11/19/24/11902465

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 64 | 2 | 63 | 4 | 61 | 3 | 62 |
| 60 | 5 | 59 | 6 | 57 | 8 | 58 | 7 |
| 41 | 24 | 42 | 23 | 44 | 21 | 43 | 22 |
| 40 | 25 | 39 | 26 | 37 | 28 | 38 | 27 |
| 29 | 36 | 30 | 35 | 32 | 33 | 31 | 34 |
| 20 | 45 | 19 | 46 | 17 | 48 | 18 | 47 |
| 53 | 12 | 54 | 11 | 56 | 9 | 55 | 10 |
| 16 | 49 | 15 | 50 | 13 | 52 | 14 | 51 |

6/ 1/ 9/12/19/24/14782465

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 64 | 2 | 63 | 4 | 61 | 3 | 62 |
| 60 | 5 | 59 | 6 | 57 | 8 | 58 | 7 |
| 41 | 24 | 42 | 23 | 44 | 21 | 43 | 22 |
| 20 | 45 | 19 | 46 | 17 | 48 | 18 | 47 |
| 53 | 12 | 54 | 11 | 56 | 9 | 55 | 10 |
| 40 | 25 | 39 | 26 | 37 | 28 | 38 | 27 |
| 29 | 36 | 30 | 35 | 32 | 33 | 31 | 34 |
| 16 | 49 | 15 | 50 | 13 | 52 | 14 | 51 |

7/ 1/ 8/12/19/24/17662465

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 64 | 2 | 63 | 4 | 61 | 3 | 62 |
| 60 | 5 | 59 | 6 | 57 | 8 | 58 | 7 |
| 41 | 24 | 42 | 23 | 44 | 21 | 43 | 22 |
| 20 | 45 | 19 | 46 | 17 | 48 | 18 | 47 |
| 53 | 12 | 54 | 11 | 56 | 9 | 55 | 10 |
| 16 | 49 | 15 | 50 | 13 | 52 | 14 | 51 |
| 29 | 36 | 30 | 35 | 32 | 33 | 31 | 34 |
| 40 | 25 | 39 | 26 | 37 | 28 | 38 | 27 |

8/ 1/ 7/12/19/24/20924929

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 64 | 2 | 63 | 4 | 61 | 3 | 62 |
| 60 | 5 | 59 | 6 | 57 | 8 | 58 | 7 |
| 41 | 24 | 42 | 23 | 44 | 21 | 43 | 22 |
| 20 | 45 | 19 | 46 | 17 | 48 | 18 | 47 |
| 29 | 36 | 30 | 35 | 32 | 33 | 31 | 34 |
| 40 | 25 | 39 | 26 | 37 | 28 | 38 | 27 |
| 53 | 12 | 54 | 11 | 56 | 9 | 55 | 10 |
| 16 | 49 | 15 | 50 | 13 | 52 | 14 | 51 |

9/ 1/ 6/12/19/24/23804929

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 64 | 2 | 63 | 4 | 61 | 3 | 62 |
| 60 | 5 | 59 | 6 | 57 | 8 | 58 | 7 |
| 41 | 24 | 42 | 23 | 44 | 21 | 43 | 22 |
| 20 | 45 | 19 | 46 | 17 | 48 | 18 | 47 |
| 29 | 36 | 30 | 35 | 32 | 33 | 31 | 34 |
| 16 | 49 | 15 | 50 | 13 | 52 | 14 | 51 |
| 53 | 12 | 54 | 11 | 56 | 9 | 55 | 10 |
| 40 | 25 | 39 | 26 | 37 | 28 | 38 | 27 |

10/ 3/ 4/ 8/19/24/27067393

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 64 | 2 | 63 | 4 | 61 | 3 | 62 |
| 32 | 33 | 31 | 34 | 29 | 36 | 30 | 35 |
| 13 | 52 | 14 | 51 | 16 | 49 | 15 | 50 |
| 44 | 21 | 43 | 22 | 41 | 24 | 42 | 23 |
| 57 | 8 | 58 | 7 | 60 | 5 | 59 | 6 |
| 40 | 25 | 39 | 26 | 37 | 28 | 38 | 27 |
| 53 | 12 | 54 | 11 | 56 | 9 | 55 | 10 |
| 20 | 45 | 19 | 46 | 17 | 48 | 18 | 47 |

11/ 2/ 4/ 9/19/24/33702913

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 64 | 2 | 63 | 4 | 61 | 3 | 62 |
| 32 | 33 | 31 | 34 | 29 | 36 | 30 | 35 |
| 13 | 52 | 14 | 51 | 16 | 49 | 15 | 50 |
| 44 | 21 | 43 | 22 | 41 | 24 | 42 | 23 |
| 57 | 8 | 58 | 7 | 60 | 5 | 59 | 6 |
| 20 | 45 | 19 | 46 | 17 | 48 | 18 | 47 |
| 53 | 12 | 54 | 11 | 56 | 9 | 55 | 10 |
| 40 | 25 | 39 | 26 | 37 | 28 | 38 | 27 |

12/ 1/ 6/ 9/19/24/40338433

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 64 | 2 | 63 | 4 | 61 | 3 | 62 |
| 32 | 33 | 31 | 34 | 29 | 36 | 30 | 35 |
| 13 | 52 | 14 | 51 | 16 | 49 | 15 | 50 |
| 20 | 45 | 19 | 46 | 17 | 48 | 18 | 47 |
| 57 | 8 | 58 | 7 | 60 | 5 | 59 | 6 |
| 44 | 21 | 43 | 22 | 41 | 24 | 42 | 23 |
| 53 | 12 | 54 | 11 | 56 | 9 | 55 | 10 |
| 40 | 25 | 39 | 26 | 37 | 28 | 38 | 27 |

```
13/ 1/ 7/ 8/19/24/46973953
 1 64  2 63  4 61  3 62
32 33 31 34 29 36 30 35
45 20 46 19 48 17 47 18
52 13 51 14 49 16 50 15
57  8 58  7 60  5 59  6
40 25 39 26 37 28 38 27
21 44 22 43 24 41 23 42
12 53 11 54  9 56 10 55
```

```
14/ 1/ 6/ 9/19/24/53609473
 1 64  2 63  4 61  3 62
32 33 31 34 29 36 30 35
45 20 46 19 48 17 47 18
52 13 51 14 49 16 50 15
57  8 58  7 60  5 59  6
12 53 11 54  9 56 10 55
21 44 22 43 24 41 23 42
40 25 39 26 37 28 38 27
```

```
15/ 1/ 6/ 9/19/24/60244993
 1 64  2 63  4 61  3 62
32 33 31 34 29 36 30 35
45 20 46 19 48 17 47 18
52 13 51 14 49 16 50 15
25 40 26 39 28 37 27 38
44 21 43 22 41 24 42 23
53 12 54 11 56  9 55 10
 8 57  7 58  5 60  6 59
```

```
16/ 1/ 7/ 8/19/24/66880513
 1 64  2 63  4 61  3 62
32 33 31 34 29 36 30 35
45 20 46 19 48 17 47 18
52 13 51 14 49 16 50 15
25 40 26 39 28 37 27 38
 8 57  7 58  5 60  6 59
53 12 54 11 56  9 55 10
44 21 43 22 41 24 42 23
```

```
17/ 2/ 4/ 9/19/24/73516033
 1 64  2 63  4 61  3 62
32 33 31 34 29 36 30 35
45 20 46 19 48 17 47 18
12 53 11 54  9 56 10 55
57  8 58  7 60  5 59  6
52 13 51 14 49 16 50 15
21 44 22 43 24 41 23 42
40 25 39 26 37 28 38 27
```

```
18/ 2/ 5/ 7/19/24/80151553
 1 64  2 63  4 61  3 62
32 33 31 34 29 36 30 35
45 20 46 19 48 17 47 18
12 53 11 54  9 56 10 55
21 44 22 43 24 41 23 42
52 13 51 14 49 16 50 15
57  8 58  7 60  5 59  6
40 25 39 26 37 28 38 27
```

```
19/ 1/ 6/ 9/12/24/86787073
 1 64  2 63 34 31 33 32
62  3 61  4 29 36 30 35
13 52 14 51 46 19 45 20
50 15 49 16 17 48 18 47
27 38 28 37 60  5 59  6
44 21 43 22 11 54 12 53
23 42 24 41 56  9 55 10
40 25 39 26  7 58  8 57
```

```
20/ 1/ 6/ 9/12/22/90542593
 1 64  2 32 34 31 33 63
62  3 61 35 29 36 30  4
13 52 14 20 46 19 45 51
50 15 49 47 17 48 18 16
27 38 28  6 60  5 59 37
44 21 43 53 11 54 12 22
23 42 24 10 56  9 55 41
40 25 39 57  7 58  8 26
```

```
21/ 1/ 6/ 9/12/22/93915649
 1 64  2 32 34 63 33 31
62  3 61 35 29  4 30 36
13 52 14 20 46 51 45 19
50 15 49 47 17 16 18 48
27 38 28  6 60 37 59  5
44 21 43 53 11 22 12 54
23 42 24 10 56 41 55  9
40 25 39 57  7 26  8 58
```

```
22/ 1/ 6/ 9/12/20/97671169
 1 64 33 63 34 31  2 32
62  3 30  4 29 36 61 35
13 52 45 51 46 19 14 20
50 15 18 16 17 48 49 47
27 38 59 37 60  5 28  6
44 21 12 22 11 54 43 53
23 42 55 41 56  9 24 10
40 25  8 26  7 58 39 57
```

```
23/ 1/ 6/ 9/12/20/101426689
 1 64 33 63  2 31 34 32
62  3 30  4 61 36 29 35
13 52 45 51 14 19 46 20
50 15 18 16 49 48 17 47
27 38 59 37 28  5 60  6
44 21 12 22 43 54 11 53
23 42 55 41 24  9 56 10
40 25  8 26 39 58  7 57
```

```
24/ 1/ 6/ 9/12/19/105182209
 1 64 33 32 34 31  2 63
62  3 30 35 29 36 61  4
13 52 45 20 46 19 14 51
50 15 18 47 17 48 49 16
27 38 59  6 60  5 28 37
44 21 12 53 11 54 43 22
23 42 55 10 56  9 24 41
40 25  8 57  7 58 39 26
```

```
25/ 1/ 6/ 9/12/19/108555265
 1 64 33 32  2 31 34 63
62  3 30 35 61 36 29  4
13 52 45 20 14 19 46 51
50 15 18 47 49 48 17 16
27 38 59  6 28  5 60 37
44 21 12 53 43 54 11 22
23 42 55 10 24  9 56 41
40 25  8 57 39 58  7 26
```

```
26/ 1/ 6/ 9/12/19/111928321
 1 64 33 32 34 63  2 31
62  3 30 35 29  4 61 36
13 52 45 20 46 51 14 19
50 15 18 47 17 16 49 48
27 38 59  6 60 37 28  5
44 21 12 53 11 22 43 54
23 42 55 10 56 41 24  9
40 25  8 57  7 26 39 58
```

```
27/ 1/ 6/ 9/12/19/115683841
 1 64 33 32  2 63 34 31
62  3 30 35 61  4 29 36
13 52 45 20 14 51 46 19
50 15 18 47 49 16 17 48
27 38 59  6 28 37 60  5
44 21 12 53 43 22 11 54
23 42 55 10 24 41 56  9
40 25  8 57 39 26  7 58
```

```
[Count = 119439360]  OK!
```

I have got it at last! Though it took about two hours and a half for my old machine to count up through, this program ran very fast, faster than any other old methods I have ever had. I was extremely surprised.

I could also calculate Fundamental 360 Solutions of 'C&P' MS88 under the same conditions with the ones of 'C&C' MS88. Each result was the same with the one I got before.

Everything tells us that any solution of 'C&P' MS88 proves to be always 'Complete

Euler Square' of order 8, and the solution set of 'C&P' MS88 makes the subset of the one of 'C.E.S.' of order 8.

The factors are supposed to divide the next total counts of solutions as follows:

| Type/ | 'C&C'MS88 | Factors | 'C&P'MS88 |
|---|---|---|---|
| Fundamental | 90 | 90*4=360 | 360 |
| Total | 368640 | *4*81 = | 119439360 |
| Factors | 90*64*64 | *4*81 = | 360*64*64*81 |

## 7. How about 'Complete' Magic Squares 8x8?

For the next case, let's study and try to compose 'Complete' type of magic squares of order 8 by 'New Euler's Method' with binary number system, shall we?

'Complete' MS88 is a special type of 'Pan-diagonal' magic squares of order 8, and is defined under such the basic conditions as listed below with the 'Complete Conditions' assuming complementary pairs of 65 located only on pan-diagonals.

```
 ** Every row, every column and every pan-diagonal **
 ***  must add up to the same 4(magic constant)  ***
  n1+n2+n3+n4+n5+n6+n7+n8=4;          n1+n9+n17+n25+n33+n41+n49+n57=4;
  n9+n10+n11+n12+n13+n14+n15+n16=4;   n2+n10+n18+n26+n34+n42+n50+n58=4;
  n17+n18+n19+n20+n21+n22+n23+n24=4;  n3+n11+n19+n27+n35+n43+n51+n59=4;
  n25+n26+n27+n28+n29+n30+n31+n32=4;  n4+n12+n20+n28+n36+n44+n52+n60=4;
  n33+n34+n35+n36+n37+n38+n39+n40=4;  n5+n13+n21+n29+n37+n45+n53+n61=4;
  n41+n42+n43+n44+n45+n46+n47+n48=4;  n6+n14+n22+n30+n38+n46+n54+n62=4;
  n49+n50+n51+n52+n53+n54+n55+n56=4;  n7+n15+n23+n31+n39+n47+n55+n63=4;
  n57+n58+n59+n60+n61+n62+n63+n64=4;  n8+n16+n24+n32+n40+n48+n56+n64=4;

  n1+n10+n19+n28+n37+n46+n55+n64=4;   n1+n16+n23+n30+n37+n44+n51+n58=4;
  n2+n11+n20+n29+n38+n47+n56+n57=4;   n2+n9+n24+n31+n38+n45+n52+n59=4;
  n3+n12+n21+n30+n39+n48+n49+n58=4;   n3+n10+n17+n32+n39+n46+n53+n60=4;
  n4+n13+n22+n31+n40+n41+n50+n59=4;   n4+n11+n18+n25+n40+n47+n54+n61=4;
  n5+n14+n23+n32+n33+n42+n51+n60=4;   n5+n12+n19+n26+n33+n48+n55+n62=4;
  n6+n15+n24+n25+n34+n43+n52+n61=4;   n6+n13+n20+n27+n34+n41+n56+n63=4;
  n7+n16+n17+n26+n35+n44+n53+n62=4;   n7+n14+n21+n28+n35+n42+n49+n64=4;
  n8+n9+n18+n27+n36+n45+n54+n63=4;    n8+n15+n22+n29+n36+n43+n50+n57=4;

 [Complete Conditions]
 ** Complementary Pairs of 1 must be located as follows: **
  n1+n37=1;   n2+n38=1;   n3+n39=1;   n4+n40=1;   n5+n33=1;
  n6+n34=1;   n7+n35=1;   n8+n36=1;   n9+n45=1;   n10+n46=1;
  n11+n47=1;  n12+n48=1;  n13+n41=1;  n14+n42=1;  n15+n43=1;
  n16+n44=1;  n17+n53=1;  n18+n54=1;  n19+n55=1;  n20+n56=1;
  n21+n49=1;  n22+n50=1;  n23+n51=1;  n24+n52=1;  n25+n61=1;
  n26+n62=1;  n27+n63=1;  n28+n64=1;  n29+n57=1;  n30+n58=1;
  n31+n59=1;  n32+n60=1;
```

We don't assume any 'Composite Conditions' here. Therefore it is naturally considered that there are far more solutions than 'Composite and Complete' type.

We already know there are many 'Non-Euler Squares' 8x8, far more than 'Complete Euler Squares' 8x8. But we know nothing about the total count, either of 'Euler' type or of 'Non-Euler' one. I am afraid they are almost uncountable.

At first I counted how many Latin Squares should be made to compose our object solutions. The next list shows part of my newest calculation.

```
[Latin Squares for 'Complete' Magic Squares 8x8]

      1/    6346/   12691/   16921/   25381/   31726/   38071/   42301/
00011110 00001111 00011110 00001111 00011110 00001111 00011110 00001111
00110101 00111001 00110101 00110101 00110101 00110101 00110101 00110101
01010011 11010010 11000011 01010011 01100011 01110010 01100011 01110001
11100001 11100100 01110001 11110000 11100010 11100010 11010001 11010010
00011110 00001111 00011110 00001111 00011110 00001111 00011110 00001111
10101100 01101100 10101100 10101100 10101100 10101100 10101100 10101100
11001010 11010010 11000011 11001010 11001001 11011000 11001001 11101000
11100001 10110001 11101000 11110000 11010001 11010001 11100010 11010010

  50761/   57106/   63451/   67681/   76141/   82486/   88831/   93061/
00011110 00001111 00011110 00001111 00011110 00001111 00011110 00001111
01100101 01110100 01100101 01110001 01010101 01010101 01010101 01010101
01010011 01010011 01010011 01010011 00110011 01110010 01100011 00110011
11100100 11100100 10110001 10110100 11100001 11100100 10110001 11110000
00011110 00001111 00011110 00001111 00011110 00001111 00011110 00001111
10101001 10111000 10101001 11101000 10101010 10101010 10101010 10101010
11001010 11001010 11001010 11001010 11001100 11011000 11001001 11001100
10110001 10110001 11100100 10110100 11100001 10110001 11100100 11110000

 101521/  109981/  114211/  120556/  126901/  135361/  139591/  145936/
10001110 10000111 10001110 10000111 10001110 10000111 10001110 10000111
00111001 00111001 00110101 00111001 00110101 00111001 00110101 00011101
01010011 01011010 01010011 01010011 01110010 01110010 01100011 01110001
11100100 11100100 01110001 01110100 01100011 01100110 01110010 01110010
00010111 10000111 00010111 10000111 00010111 10000111 00010111 10000111
01101100 01101100 10101100 01101100 10101100 01101100 10101100 00101110
11001010 01011010 11001010 11001010 11011000 11011000 11001001 11101000
10110001 10110001 11101000 10111000 11001001 10011001 11011000 11011000

 152281/  160741/  164971/  171316/  177661/  186121/  190351/  196696/
10001110 10000111 10001110 10000111 10001110 10000111 10001110 10000111
01110100 01110100 01100101 01101100 01010101 01011100 01010101 01001101
01010011 01011001 01010011 01010011 01110001 01110001 00110011 01110010
01100101 01100110 01110100 01110100 01100110 01100110 01110001 01110100
00010111 10000111 00010111 10000111 00010111 10000111 00010111 10000111
10111000 10111000 10101001 00111001 10101010 00111010 10101010 00101011
11001010 01101010 11001010 11001010 11101000 11101000 11001100 11011000
10101001 10011001 10111000 10111000 10011001 10011001 11101000 10111000

[Count = 203040]
```

Why! What a number of Latin Squares could be found! Do we really have to examine so many solutions as almost $203040^6$ ?

I cannot make such big memory arrays as `tlu[203041][65]`, `mtc[203041][203041]` even in char type. I could not help giving it up. Anyone might do that with any new machine, though I am afraid it would probably take too long time to go on.

But it was quite a relief that we could imagine and guess what a scale they have.

### 8. How about Composing Simultaneous MS88: Both Self-C. and Pan-D.?

What else can we compose by New Euler's Method with binary decompositions?

Why don't we compose the Simultaneous type of Magic Squares of order 8: both Self-complementary and Pan-diagonal?

I remember I heard from Dr. Mutsumi Suzuki that Mr. Harvey Heinz told us about his discovery of 'Self-similar and Pan-diagonal Type Associated'(according to his naming) of order 8 around spring in 2001. I was really surprised at the news. I had no idea at all about Simultaneous type of any even order such as 4 or 8 before that news.

We know Self-complementary and 'Complete' type of any even order cannot co-exist simultaneously. But if he tried to combine Self-complementary type with 'Pan-diagonal' one even of order 8, both types might co-exist at the same time, I guess.

Let's examine and verify if it is true, by composing those objects actually as 'Complete Euler Squares' by New Euler's Method with binary number system.

We don't assume both 'Complete Conditions' and 'Composite Conditions' here, but assume the basic conditions of 'Complete Euler Squares' with the 'Self-complementary Conditions' as shown below:

```
[Self-Complementary Conditions]
** Complementary pairs of 1 must be located symmetrically **
***  with respect to the geometric center of the square. ***
 n1+n64=1;    n2+n63=1;    n3+n62=1;    n4+n61=1;    n5+n60=1;
 n6+n59=1;    n7+n58=1;    n8+n57=1;    n9+n56=1;    n10+n55=1;
 n11+n54=1;   n12+n53=1;   n13+n52=1;   n14+n51=1;   n15+n50=1;
 n16+n49=1;   n17+n48=1;   n18+n47=1;   n19+n46=1;   n20+n45=1;
 n21+n44=1;   n22+n43=1;   n23+n22=1;   n24+n41=1;   n25+n40=1;
 n26+n39=1;   n27+n38=1;   n28+n37=1;   n29+n36=1;   n30+n35=1;
 n31+n34=1;   n32+n33=1;   n33+n32=1;   n34+n31=1;   .......
```

We can define such variable pairs as `(n1, n64), (n2, n63), (n3, n62), ..., (n31, n34), (n32, n33)` at the same procedure like `n64=1-n1; n63=1-n2; n62=1-n3; ...; n34=1-n31; n33=1-n32; ...`

I actually got so many Latin Squares as 1232. This count is far more than the one of 'Composite & Pan-diagonal' type. Do I have to examine so many solutions as $_{616}P_6 * 2^6$ ?

I decided to count only the standard type with n1=1, and to use first 616 Latin Squares only to combine and compose the objects, and prepared smaller arrays: `tlu[617][65], mtc[617][617]` for data storage. That might save our time a lot.

The next list shows part of my newest composition:

```
* List of Simultaneous Magic Squares 8x8: Self-complementary & Pan-diagonal *
      1/      20/      102/      155/      239/      475/                     1/
 01010101 01100011 00110101 00111010 01010101 01011001   1 52 29 48  6 43 21 60
 10100101 10011100 00111010 00110101 10101010 01010110  51  2 47 30 27 54 12 37
 01011010 10010011 11000101 11001010 10101010 10100110  32 45  4 49 39 10 56 25
 10101010 01101100 11001010 11000101 01010101 10101001  46 31 50  3 58 23 41  8
 10101010 11001001 10101100 01011100 01010101 01101010  57 24 42  7 62 15 34 19
 10100101 00110110 01011100 10101100 10101010 10011010  40  9 55 26 16 61 20 33
 01011010 11000110 10100011 01010011 10101010 10010101  28 53 11 38 35 18 63 14
 01010101 00111001 01010011 10100011 01010101 01100101   5 44 22 59 17 36 13 64
      1/      34/       80/      136/      239/      365/                 29593/
 01010101 00110011 01011001 01100110 01010101 01011010   1 48 21 60 10 39 22 59
 10100101 00111100 10011010 10011001 10101010 01010011  47  2 51 30 31 49 12 38
 01011010 11000011 10010101 10011001 10101010 11001010  32 50  3 45 40  9 52 29
 10101010 11001100 10101001 01100110 01010101 00111100  57 23 46  4 58 24 37 11
 10101010 11001100 01101010 10011001 01010101 11000011  54 28 41  7 61 19 42  8
 10100101 00111100 01010110 01100110 10101010 10101100  36 13 56 25 20 62 15 33
 01011010 11000011 10100110 01100110 10101010 00110101  27 53 16 34 35 14 63 18
 01010101 00110011 01100101 10011001 01010101 10100101   6 43 26 55  5 44 17 64
```

| 1/ | 61/ | 97/ | 148/ | 236/ | 468/ | 137769/ | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01010101 | 01010011 | 01101001 | 00111100 | 00110101 | 01010101 | 1 | 58 | 15 | 56 | 13 | 40 | 17 | 60 |
| 10100101 | 00111010 | 10010110 | 10011001 | 10101100 | 01011010 | 47 | 2 | 51 | 30 | 24 | 43 | 26 | 37 |
| 01011010 | 11001010 | 10010110 | 10011001 | 10100011 | 10100101 | 32 | 49 | 4 | 45 | 53 | 10 | 59 | 8 |
| 10101010 | 11000101 | 01101001 | 11000011 | 01011100 | 10101010 | 54 | 31 | 42 | 3 | 44 | 19 | 38 | 29 |
| 10101010 | 01011100 | 01101001 | 00111100 | 11000101 | 10101010 | 36 | 27 | 46 | 21 | 62 | 23 | 34 | 11 |
| 10100101 | 10101100 | 10010110 | 01100110 | 00111010 | 01011010 | 57 | 6 | 55 | 12 | 20 | 61 | 16 | 33 |
| 01011010 | 10100011 | 10010110 | 01100110 | 11001010 | 10100101 | 28 | 39 | 22 | 41 | 35 | 14 | 63 | 18 |
| 01010101 | 00110101 | 01101001 | 11000011 | 01010011 | 01010101 | 5 | 48 | 25 | 52 | 9 | 50 | 7 | 64 |

1/ 65/ 36/165/239/468/ 176745/

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 52 | 29 | 48 | 9 | 40 | 21 | 60 |
| 47 | 2 | 39 | 30 | 28 | 41 | 20 | 53 |
| 32 | 49 | 4 | 57 | 55 | 6 | 43 | 14 |
| 58 | 31 | 38 | 3 | 46 | 23 | 50 | 11 |
| 54 | 15 | 42 | 19 | 62 | 27 | 34 | 7 |
| 51 | 22 | 59 | 10 | 8 | 61 | 16 | 33 |
| 12 | 45 | 24 | 37 | 35 | 26 | 63 | 18 |
| 5 | 44 | 25 | 56 | 17 | 36 | 13 | 64 |

1/ 66/ 32/167/239/468/ 204513/

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 52 | 29 | 48 | 21 | 40 | 9 | 60 |
| 47 | 2 | 39 | 30 | 28 | 53 | 20 | 41 |
| 32 | 49 | 4 | 57 | 43 | 6 | 55 | 14 |
| 58 | 31 | 38 | 3 | 46 | 11 | 50 | 23 |
| 42 | 15 | 54 | 19 | 62 | 27 | 34 | 7 |
| 51 | 10 | 59 | 22 | 8 | 61 | 16 | 33 |
| 24 | 45 | 12 | 37 | 35 | 26 | 63 | 18 |
| 5 | 56 | 25 | 44 | 17 | 36 | 13 | 64 |

1/ 68/ 83/205/234/314/ 232017/

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 48 | 23 | 53 | 30 | 34 | 11 | 60 |
| 41 | 2 | 58 | 16 | 20 | 55 | 29 | 39 |
| 32 | 59 | 3 | 57 | 37 | 14 | 40 | 18 |
| 56 | 21 | 46 | 4 | 43 | 27 | 50 | 13 |
| 52 | 15 | 38 | 22 | 61 | 19 | 44 | 9 |
| 47 | 25 | 51 | 28 | 8 | 62 | 6 | 33 |
| 26 | 36 | 10 | 45 | 49 | 7 | 63 | 24 |
| 5 | 54 | 31 | 35 | 12 | 42 | 17 | 64 |

1/ 77/ 36/136/239/432/ 253995/

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 55 | 14 | 59 | 9 | 40 | 22 | 60 |
| 47 | 2 | 52 | 30 | 31 | 42 | 19 | 37 |
| 32 | 50 | 4 | 45 | 39 | 17 | 44 | 29 |
| 57 | 16 | 53 | 3 | 58 | 24 | 38 | 11 |
| 54 | 27 | 41 | 7 | 62 | 12 | 49 | 8 |
| 36 | 21 | 48 | 26 | 20 | 61 | 15 | 33 |
| 28 | 46 | 23 | 34 | 35 | 13 | 63 | 18 |
| 5 | 43 | 25 | 56 | 6 | 51 | 10 | 64 |

1/ 80/ 34/136/239/365/ 346443/

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 56 | 13 | 60 | 18 | 39 | 14 | 59 |
| 55 | 2 | 43 | 30 | 31 | 41 | 20 | 38 |
| 32 | 42 | 3 | 53 | 40 | 17 | 44 | 29 |
| 57 | 15 | 54 | 4 | 58 | 16 | 37 | 19 |
| 46 | 28 | 49 | 7 | 61 | 11 | 50 | 8 |
| 36 | 21 | 48 | 25 | 12 | 62 | 23 | 33 |
| 27 | 45 | 24 | 34 | 35 | 22 | 63 | 10 |
| 6 | 51 | 26 | 47 | 5 | 52 | 9 | 64 |

1/ 83/ 34/136/239/468/ 374131/

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 56 | 13 | 44 | 17 | 40 | 29 | 60 |
| 55 | 2 | 59 | 30 | 16 | 41 | 20 | 37 |
| 32 | 57 | 4 | 53 | 39 | 18 | 43 | 14 |
| 42 | 15 | 54 | 3 | 58 | 31 | 38 | 19 |
| 46 | 27 | 34 | 7 | 62 | 11 | 50 | 23 |
| 51 | 22 | 47 | 26 | 12 | 61 | 8 | 33 |
| 28 | 45 | 24 | 49 | 35 | 6 | 63 | 10 |
| 5 | 36 | 25 | 48 | 21 | 52 | 9 | 64 |

1/ 87/ 24/136/239/432/ 396471/

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 55 | 22 | 59 | 9 | 40 | 14 | 60 |
| 47 | 2 | 44 | 30 | 31 | 50 | 19 | 37 |
| 32 | 42 | 4 | 45 | 39 | 17 | 52 | 29 |
| 57 | 24 | 53 | 3 | 58 | 16 | 38 | 11 |
| 54 | 27 | 49 | 7 | 62 | 12 | 41 | 8 |
| 36 | 13 | 48 | 26 | 20 | 61 | 23 | 33 |
| 28 | 46 | 15 | 34 | 35 | 21 | 63 | 18 |
| 5 | 51 | 25 | 56 | 6 | 43 | 10 | 64 |

1/ 90/ 34/124/239/475/ 456687/

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 56 | 25 | 48 | 6 | 51 | 13 | 60 |
| 55 | 2 | 43 | 30 | 31 | 42 | 20 | 37 |
| 32 | 41 | 4 | 53 | 39 | 18 | 44 | 29 |
| 46 | 27 | 54 | 3 | 58 | 15 | 49 | 8 |
| 57 | 16 | 50 | 7 | 62 | 11 | 38 | 19 |
| 36 | 21 | 47 | 26 | 12 | 61 | 24 | 33 |
| 28 | 45 | 23 | 34 | 35 | 22 | 63 | 10 |
| 5 | 52 | 14 | 59 | 17 | 40 | 9 | 64 |

1/ 92/ 68/257/267/398/ 481719/

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 56 | 31 | 42 | 15 | 35 | 18 | 62 |
| 53 | 2 | 41 | 20 | 28 | 48 | 29 | 39 |
| 16 | 59 | 8 | 61 | 33 | 21 | 52 | 10 |
| 60 | 25 | 38 | 7 | 54 | 14 | 43 | 19 |
| 46 | 22 | 51 | 11 | 58 | 27 | 40 | 5 |
| 55 | 13 | 44 | 32 | 4 | 57 | 6 | 49 |
| 26 | 36 | 17 | 37 | 45 | 24 | 63 | 12 |
| 3 | 47 | 30 | 50 | 23 | 34 | 9 | 64 |

1/ 94/ 34/128/239/594/ 490695/

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 56 | 26 | 43 | 5 | 40 | 30 | 59 |
| 55 | 2 | 48 | 29 | 15 | 42 | 20 | 49 |
| 31 | 46 | 4 | 53 | 51 | 18 | 44 | 13 |
| 41 | 28 | 54 | 3 | 57 | 32 | 38 | 7 |
| 58 | 27 | 33 | 8 | 62 | 11 | 37 | 24 |
| 52 | 21 | 47 | 14 | 12 | 61 | 19 | 34 |
| 16 | 45 | 23 | 50 | 36 | 17 | 63 | 10 |
| 6 | 35 | 25 | 60 | 22 | 39 | 9 | 64 |

1/ 96/ 24/136/239/424/ 513277/

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 55 | 22 | 44 | 9 | 40 | 29 | 60 |
| 47 | 2 | 59 | 30 | 16 | 50 | 19 | 37 |
| 32 | 57 | 4 | 45 | 39 | 17 | 52 | 14 |
| 42 | 24 | 53 | 3 | 58 | 31 | 38 | 11 |
| 54 | 27 | 34 | 7 | 62 | 12 | 41 | 23 |
| 51 | 13 | 48 | 26 | 20 | 61 | 8 | 33 |
| 28 | 46 | 15 | 49 | 35 | 6 | 63 | 18 |
| 5 | 36 | 25 | 56 | 21 | 43 | 10 | 64 |

1/ 97/ 34/124/239/468/ 571021/

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 56 | 25 | 48 | 21 | 36 | 13 | 60 |
| 55 | 2 | 43 | 30 | 16 | 57 | 20 | 37 |
| 32 | 41 | 4 | 53 | 39 | 18 | 59 | 14 |
| 46 | 27 | 54 | 3 | 58 | 15 | 34 | 23 |
| 42 | 31 | 50 | 7 | 62 | 11 | 38 | 19 |
| 51 | 6 | 47 | 26 | 12 | 61 | 24 | 33 |
| 28 | 45 | 8 | 49 | 35 | 22 | 63 | 10 |
| 5 | 52 | 29 | 44 | 17 | 40 | 9 | 64 |

. . . . . . . .

1/597/ 20/111/198/239/ 6724223/

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 60 | 31 | 40 | 21 | 52 | 9 | 46 |
| 58 | 17 | 38 | 15 | 12 | 61 | 24 | 35 |
| 16 | 37 | 18 | 57 | 36 | 23 | 62 | 11 |
| 39 | 32 | 59 | 2 | 45 | 10 | 51 | 22 |
| 43 | 14 | 55 | 20 | 63 | 6 | 33 | 26 |
| 54 | 3 | 42 | 29 | 8 | 47 | 28 | 49 |
| 30 | 41 | 4 | 53 | 50 | 27 | 48 | 7 |
| 19 | 56 | 13 | 44 | 25 | 34 | 5 | 64 |

1/600/ 77/ 97/153/241/ 6752133/

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 62 | 23 | 44 | 24 | 33 | 27 | 46 |
| 40 | 17 | 43 | 13 | 12 | 55 | 30 | 50 |
| 14 | 59 | 18 | 56 | 34 | 29 | 39 | 11 |
| 60 | 7 | 61 | 2 | 45 | 28 | 49 | 8 |
| 57 | 16 | 37 | 20 | 63 | 4 | 58 | 5 |
| 54 | 26 | 36 | 31 | 9 | 47 | 6 | 51 |
| 15 | 35 | 10 | 53 | 52 | 22 | 48 | 25 |
| 19 | 38 | 32 | 41 | 21 | 42 | 3 | 64 |

1/602/ 34/ 94/214/239/ 6779901/

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 40 | 31 | 58 | 3 | 52 | 29 | 46 |
| 38 | 17 | 60 | 15 | 10 | 43 | 24 | 53 |
| 16 | 59 | 18 | 37 | 54 | 23 | 44 | 9 |
| 57 | 32 | 39 | 2 | 45 | 30 | 51 | 4 |
| 61 | 14 | 35 | 20 | 63 | 26 | 33 | 8 |
| 56 | 21 | 42 | 11 | 28 | 47 | 6 | 49 |
| 12 | 41 | 22 | 55 | 50 | 5 | 48 | 27 |
| 19 | 36 | 13 | 62 | 7 | 34 | 25 | 64 |

1/606/ 34/ 97/198/239/ 6802749/

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 40 | 31 | 60 | 21 | 52 | 9 | 46 |
| 38 | 17 | 58 | 15 | 12 | 61 | 24 | 35 |
| 16 | 57 | 18 | 37 | 36 | 23 | 62 | 11 |
| 59 | 32 | 39 | 2 | 45 | 10 | 51 | 22 |
| 43 | 14 | 55 | 20 | 63 | 26 | 33 | 6 |
| 54 | 3 | 42 | 29 | 28 | 47 | 8 | 49 |
| 30 | 41 | 4 | 53 | 50 | 7 | 48 | 27 |
| 19 | 56 | 13 | 44 | 5 | 34 | 25 | 64 |

2/ 19/101/156/239/475/ 6832439/

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 52 | 29 | 48 | 6 | 43 | 21 | 60 |
| 51 | 2 | 47 | 30 | 39 | 54 | 12 | 25 |
| 32 | 45 | 4 | 49 | 27 | 10 | 56 | 37 |
| 46 | 31 | 50 | 3 | 58 | 23 | 41 | 8 |
| 57 | 24 | 42 | 7 | 62 | 15 | 34 | 19 |
| 28 | 9 | 55 | 38 | 16 | 61 | 20 | 33 |
| 40 | 53 | 11 | 26 | 35 | 18 | 63 | 14 |
| 5 | 44 | 22 | 59 | 17 | 36 | 13 | 64 |

2/ 33/ 79/136/239/366/ 6862003/

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 48 | 21 | 60 | 10 | 39 | 22 | 59 |
| 47 | 2 | 51 | 30 | 40 | 49 | 12 | 29 |
| 32 | 50 | 3 | 45 | 31 | 9 | 52 | 38 |
| 57 | 23 | 46 | 4 | 58 | 24 | 37 | 11 |
| 54 | 28 | 41 | 7 | 61 | 19 | 42 | 8 |
| 27 | 13 | 56 | 34 | 20 | 62 | 15 | 33 |
| 36 | 53 | 16 | 25 | 35 | 14 | 63 | 18 |
| 6 | 43 | 26 | 55 | 5 | 44 | 17 | 64 |

2/ 61/ 97/148/235/467/ 6970381/

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 58 | 15 | 56 | 13 | 40 | 17 | 60 |
| 47 | 2 | 51 | 30 | 53 | 43 | 26 | 8 |
| 32 | 49 | 4 | 45 | 24 | 10 | 59 | 37 |
| 54 | 31 | 42 | 3 | 44 | 19 | 38 | 29 |
| 36 | 27 | 46 | 21 | 62 | 23 | 34 | 11 |
| 28 | 6 | 55 | 41 | 20 | 61 | 16 | 33 |
| 57 | 39 | 22 | 12 | 35 | 14 | 63 | 18 |
| 5 | 48 | 25 | 52 | 9 | 50 | 7 | 64 |

2/ 67/ 83/206/234/313/ 7006117/

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 48 | 23 | 53 | 30 | 34 | 11 | 60 |
| 41 | 2 | 58 | 16 | 39 | 55 | 29 | 20 |
| 32 | 59 | 3 | 57 | 18 | 14 | 40 | 37 |
| 56 | 21 | 46 | 4 | 43 | 27 | 50 | 13 |
| 52 | 15 | 38 | 22 | 61 | 19 | 44 | 9 |
| 28 | 25 | 51 | 47 | 8 | 62 | 6 | 33 |
| 45 | 36 | 10 | 26 | 49 | 7 | 63 | 24 |
| 5 | 54 | 31 | 35 | 12 | 42 | 17 | 64 |

2/ 76/ 35/136/239/432/ 7026861/

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 55 | 14 | 59 | 9 | 40 | 22 | 60 |
| 47 | 2 | 52 | 30 | 39 | 42 | 19 | 29 |
| 32 | 50 | 4 | 45 | 31 | 17 | 44 | 37 |
| 57 | 16 | 53 | 3 | 58 | 24 | 38 | 11 |
| 54 | 27 | 41 | 7 | 62 | 12 | 49 | 8 |
| 28 | 21 | 48 | 34 | 20 | 61 | 15 | 33 |
| 36 | 46 | 23 | 26 | 35 | 13 | 63 | 18 |
| 5 | 43 | 25 | 56 | 6 | 51 | 10 | 64 |

2/ 79/ 33/136/239/366/ 7106277/

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 56 | 13 | 60 | 18 | 39 | 14 | 59 |
| 55 | 2 | 43 | 30 | 40 | 41 | 20 | 29 |
| 32 | 42 | 3 | 53 | 31 | 17 | 44 | 38 |
| 57 | 15 | 54 | 4 | 58 | 16 | 37 | 19 |
| 46 | 28 | 49 | 7 | 61 | 11 | 50 | 8 |
| 27 | 21 | 48 | 34 | 12 | 62 | 23 | 33 |
| 36 | 45 | 24 | 25 | 35 | 22 | 63 | 10 |
| 6 | 51 | 26 | 47 | 5 | 52 | 9 | 64 |

2/ 83/ 33/136/239/467/ 7131933/

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 56 | 13 | 44 | 17 | 40 | 29 | 60 |
| 55 | 2 | 59 | 30 | 39 | 41 | 20 | 14 |
| 32 | 57 | 4 | 53 | 16 | 18 | 43 | 37 |
| 42 | 15 | 54 | 3 | 58 | 31 | 38 | 19 |
| 46 | 27 | 34 | 7 | 62 | 11 | 50 | 23 |
| 28 | 22 | 47 | 49 | 12 | 61 | 8 | 33 |
| 51 | 45 | 24 | 26 | 35 | 6 | 63 | 10 |
| 5 | 36 | 25 | 48 | 21 | 52 | 9 | 64 |

2/ 86/ 23/136/239/432/ 7155743/

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 55 | 22 | 59 | 9 | 40 | 14 | 60 |
| 47 | 2 | 44 | 30 | 39 | 50 | 19 | 29 |
| 32 | 42 | 4 | 45 | 31 | 17 | 52 | 37 |
| 57 | 24 | 53 | 3 | 58 | 16 | 38 | 11 |
| 54 | 27 | 49 | 7 | 62 | 12 | 41 | 8 |
| 28 | 13 | 48 | 34 | 20 | 61 | 23 | 33 |
| 36 | 46 | 15 | 26 | 35 | 21 | 63 | 18 |
| 5 | 51 | 25 | 56 | 6 | 43 | 10 | 64 |

2/ 89/ 33/124/239/475/ 7215959/

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 56 | 25 | 48 | 6 | 51 | 13 | 60 |
| 55 | 2 | 43 | 30 | 39 | 42 | 20 | 29 |
| 32 | 41 | 4 | 53 | 31 | 18 | 44 | 37 |
| 46 | 27 | 54 | 3 | 58 | 15 | 49 | 8 |
| 57 | 16 | 50 | 7 | 62 | 11 | 38 | 19 |
| 28 | 21 | 47 | 34 | 12 | 61 | 24 | 33 |
| 36 | 45 | 23 | 26 | 35 | 22 | 63 | 10 |
| 5 | 52 | 14 | 59 | 17 | 40 | 9 | 64 |

2/ 95/ 33/127/239/594/ 7239511/

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 56 | 26 | 43 | 5 | 40 | 30 | 59 |
| 55 | 2 | 48 | 29 | 51 | 42 | 20 | 13 |
| 31 | 46 | 4 | 53 | 15 | 18 | 44 | 49 |
| 41 | 28 | 54 | 3 | 57 | 32 | 38 | 7 |
| 58 | 27 | 33 | 8 | 62 | 11 | 37 | 24 |
| 16 | 21 | 47 | 50 | 12 | 61 | 19 | 34 |
| 52 | 45 | 23 | 14 | 36 | 17 | 63 | 10 |
| 6 | 35 | 25 | 60 | 22 | 39 | 9 | 64 |

2/ 96/ 23/136/239/423/ 7258923/

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 55 | 22 | 44 | 9 | 40 | 29 | 60 |
| 47 | 2 | 59 | 30 | 39 | 50 | 19 | 14 |
| 32 | 57 | 4 | 45 | 16 | 17 | 52 | 37 |
| 42 | 24 | 53 | 3 | 58 | 31 | 38 | 11 |
| 54 | 27 | 34 | 7 | 62 | 12 | 41 | 23 |
| 28 | 13 | 48 | 49 | 20 | 61 | 8 | 33 |
| 51 | 46 | 15 | 26 | 35 | 6 | 63 | 18 |
| 5 | 36 | 25 | 56 | 21 | 43 | 10 | 64 |

```
  2/ 97/ 33/124/239/467/    2/101/ 19/156/239/475/    2/106/ 19/150/239/475/
                7316571/                  7458807/                  7495939/
  1 56 25 48 21 36 13 60    1 44 29 56  6 51 13 60    1 44 29 56  6 39 25 60
 55  2 43 30 39 57 20 14   43  2 55 30 39 46 20 25   43  2 55 30 51 46 20 13
 32 41  4 53 16 18 59 37   32 53  4 41 27 18 48 37   32 53  4 41 15 18 48 49
 46 27 54  3 58 15 34 23   54 31 42  3 58 15 49  8   54 31 42  3 58 27 37  8
 42 31 50  7 62 11 38 19   57 16 50  7 62 23 34 11   57 28 38  7 62 23 34 11
 28  6 47 49 12 61 24 33   28 17 47 38 24 61 12 33   16 17 47 50 24 61 12 33
 51 45  8 26 35 22 63 10   40 45 19 26 35 10 63 22   52 45 19 14 35 10 63 22
  5 52 29 44 17 40  9 64    5 52 14 59  9 36 21 64    5 40 26 59  9 36 21 64

 . . . . . . . . .
```

The result proved Mr. H. Heinz told us truth. I would like to call such miraculous squares as "Heinz Squares 8x8" for the expression of my highest praise and respect to Grand Harvey Heinz.

I could not calculate how many object solutions do really exist, but I can guess fewer solutions exist, far fewer than simple 'Pan-diagonal' type or 'Self-Complementary' one.
I can also imagine there might be far more 'Non-Euler' type than 'Euler' one.
The world of MS88 is really as great as a vast, deep and rich ocean.

## 9. Do Three-type Simultaneous Magic Squares 8x8 Exist?

My imagination grew wilder and wilder. I began to wonder if any 3-Type Simultaneous MS88: Self-complementary, Pan-diagonal and 'Composite' type exist in our world.
I was afraid there might be no one at all, but I wished there might be a few solutions of that type. I could not but try to make some experiments to know that.
Let's compose such objects now, shall we? Now that we are going to make one of the 'Composite' types, we can surely design them as 'Complete Euler Squares' 8x8, can't we? Let's build it by our 'New Euler's Method' with binary decompositions.

**9-1.** Let's make the Latin Squares for those objects at first. How do we design?
We have to assume the same conditions as the previous two-type Simultaneous one and add all the 'Composite Conditions' to them.

**9-2.** I must report here I could make 12 Latin Squares for them. My hope grew bigger and bigger.
I prepared memory arrays tlu[13][65], mtc[13][13]; and made the reference table of matching digits to know how similar any two Latin unit pairs picked up are.

**9-3.** I chose 6 Latin Squares to combine and compose our object, and examined them if any wrong combination of units was made or not. When our combination was all right, I calculated and composed our solution from those 6 layers of binary decompositions assumed:

```
    Vn = An*32+Bn*16+Cn*8+Dn*4+En*2+Fn*1+1;
      (n=1, 2, 3, 4, ... , 63, 64: in Classical Notation)
```

**9-4.** Before listing it out, I selected the correct answers under the next list-forming conditions to get only the 'standard solutions':

```
    (n1<n64)&&(n1<n8)&&(n1<n57)&&(n2>n5)
```

**9-5.** Program List

```
/** 'Complete Euler Squares' of Order 8 for Three-Type Simultaneous **/
/**  Magic Squares: Composite, Self-complementary and Pan-diagonal   **/
```

```c
/**  by 'New Euler's Method' with Binary Decompositions  **/
/** 'CES8Sml3.c' built by Kanji Setsda **/
/**  on Oct. 23, 2003; Mar.29, 2006; **/
/**  Working on MacOSX and Xcode 2.1 **/
/**/
#include <stdio.h>
/**/
short int cnt, cnt1, cnt2, cnt3;
short CC, ltype;
short nm[65], uflg[65];
short anm[4][72];
short u1,u2,u3,u4,u5,u6;
short tlu[13][65];
short mtc[13][13];
/**/
short rw1[2], cl1[2], pd1[2], pb1[2];
short rw2[2], cl2[2], pd2[2], pb2[2];
short rw3[2], cl3[2], pd3[2], pb3[2];
short rw4[2], cl4[2], pd4[2], pb4[2];
short rw5[2], cl5[2], pd5[2], pb5[2];
short rw6[2], cl6[2], pd6[2], pb6[2];
short rw7[2], cl7[2], pd7[2], pb7[2];
short rw8[2], cl8[2], pd8[2], pb8[2];
/**/
/* . . . . . */
/**/
int main(){
 short n;
  printf("\n** 'Complete Euler Squares' for Simultaneous MS88:  **\n");
  printf("**  Composite, Self-complementary and Pan-diagonal  **\n");
  printf("** by 'New Euler's Method' of Binary Decompositions **\n");
  for(n=0;n<65;n++){nm[n]=0;}
  for(n=0;n<2;n++){
    rw1[n]=0; cl1[n]=0; pd1[n]=0; pb1[n]=0;
    rw2[n]=0; cl2[n]=0; pd2[n]=0; pb2[n]=0;
    rw3[n]=0; cl3[n]=0; pd3[n]=0; pb3[n]=0;
    rw4[n]=0; cl4[n]=0; pd4[n]=0; pb4[n]=0;
    rw5[n]=0; cl5[n]=0; pd5[n]=0; pb5[n]=0;
    rw6[n]=0; cl6[n]=0; pd6[n]=0; pb6[n]=0;
    rw7[n]=0; cl7[n]=0; pd7[n]=0; pb7[n]=0;
    rw8[n]=0; cl8[n]=0; pd8[n]=0; pb8[n]=0;
  }
  CC=1;
  cnt=0;
  stp01();
  printf("\n [Count = %d]\n",cnt);
  printf("\n[Latin Squares of Binary Decompositions]\n");
  prlunit();
  printf("\n[Compositions of C.E.S. for 3-T Simultaneous MS88: Used Units////// S.No#]\n");
  cnt=0; cnt1=0; cnt3=0; ltype=3;
  cmbcmp();
  if(cnt3>0){ansxpr(cnt3);}
  printf(" [Count(n1=1)/Total = %d/%d]  OK!\n",cnt1,cnt);
 return 0;
}
/* Begin The Search */
/* Set n1 & n64 */
void stp01(){
 short a,b;
  for(a=0;a<2;a++){b=CC-a;
    if((rw1[a]<4)&&(cl1[a]<4)&&(pd1[a]<4)&&(pb1[a]<4)){
      if((rw8[b]<4)&&(cl8[b]<4)&&(pd1[b]<4)&&(pb7[b]<4)){
        nm[1]=a; nm[64]=b;
        rw1[a]++; cl1[a]++; pd1[a]++; pb1[a]++;
```

```
        rw8[b]++; cl8[b]++; pd1[b]++; pb7[b]++;
        stp02();
        rw1[a]--; cl1[a]--; pd1[a]--; pb1[a]--;
        rw8[b]--; cl8[b]--; pd1[b]--; pb7[b]--;
    }}
  }
}
/* Set n2 & n63 */
void stp02(){
 short a,b;
  for(a=1;a>=0;a--){b=CC-a;
    if((rw1[a]<4)&&(cl2[a]<4)&&(pd2[a]<4)&&(pb2[a]<4)){
      if((rw8[b]<4)&&(cl7[b]<4)&&(pd8[b]<4)&&(pb6[b]<4)){
        nm[2]=a; nm[63]=b;
        rw1[a]++; cl2[a]++; pd2[a]++; pb2[a]++;
        rw8[b]++; cl7[b]++; pd8[b]++; pb6[b]++;
        stp03();
        rw1[a]--; cl2[a]--; pd2[a]--; pb2[a]--;
        rw8[b]--; cl7[b]--; pd8[b]--; pb6[b]--;
    }}
  }
}
/* Set n4 & n61 */
void stp03(){
 short a,b;
  for(a=1;a>=0;a--){b=CC-a;
    if((rw1[a]<4)&&(cl4[a]<4)&&(pd4[a]<4)&&(pb4[a]<4)){
      if((rw8[b]<4)&&(cl5[b]<4)&&(pd6[b]<4)&&(pb4[b]<4)){
        nm[4]=a; nm[61]=b;
        rw1[a]++; cl4[a]++; pd4[a]++; pb4[a]++;
        rw8[b]++; cl5[b]++; pd6[b]++; pb4[b]++;
        stp04();
        rw1[a]--; cl4[a]--; pd4[a]--; pb4[a]--;
        rw8[b]--; cl5[b]--; pd6[b]--; pb4[b]--;
    }}
  }
}
/* Set n3 & n62 */
void stp04(){
 short a,b;
  for(a=0;a<2;a++){b=CC-a;
    if((rw1[a]<4)&&(cl3[a]<4)&&(pd3[a]<4)&&(pb3[a]<4)){
      if((rw8[b]<4)&&(cl6[b]<4)&&(pd7[b]<4)&&(pb5[b]<4)){
        nm[3]=a; nm[62]=b;
        rw1[a]++; cl3[a]++; pd3[a]++; pb3[a]++;
        rw8[b]++; cl6[b]++; pd7[b]++; pb5[b]++;
        if(nm[1]+nm[2]+nm[3]+nm[4]==2){stp05();}
        rw1[a]--; cl3[a]--; pd3[a]--; pb3[a]--;
        rw8[b]--; cl6[b]--; pd7[b]--; pb5[b]--;
    }}
  }
}
/* Set n6 & n59 */
void stp05(){
 short a,b;
  for(a=1;a>=0;a--){b=CC-a;
    if((rw1[a]<4)&&(cl6[a]<4)&&(pd6[a]<4)&&(pb6[a]<4)){
      if((rw8[b]<4)&&(cl3[b]<4)&&(pd4[b]<4)&&(pb2[b]<4)){
        nm[6]=a; nm[59]=b;
        rw1[a]++; cl6[a]++; pd6[a]++; pb6[a]++;
        rw8[b]++; cl3[b]++; pd4[b]++; pb2[b]++;
        stp06();
        rw1[a]--; cl6[a]--; pd6[a]--; pb6[a]--;
        rw8[b]--; cl3[b]--; pd4[b]--; pb2[b]--;
```

```
    }}
  }
}
/* Set n5 & n60 */
void stp06(){
 short a,b;
  for(a=0;a<2;a++){b=CC-a;
    if((rw1[a]<4)&&(cl5[a]<4)&&(pd5[a]<4)&&(pb5[a]<4)){
      if((rw8[b]<4)&&(cl4[b]<4)&&(pd5[b]<4)&&(pb3[b]<4)){
        nm[5]=a; nm[60]=b;
        rw1[a]++; cl5[a]++; pd5[a]++; pb5[a]++;
        rw8[b]++; cl4[b]++; pd5[b]++; pb3[b]++;
        if(nm[5]+nm[6]+nm[61]+nm[62]==2){stp07();}
        rw1[a]--; cl5[a]--; pd5[a]--; pb5[a]--;
        rw8[b]--; cl4[b]--; pd5[b]--; pb3[b]--;
    }}
  }
}
/* Set n7 & n58 */
void stp07(){
 short a,b;
  for(a=0;a<2;a++){b=CC-a;
    if((rw1[a]<4)&&(cl7[a]<4)&&(pd7[a]<4)&&(pb7[a]<4)){
      if((rw8[b]<4)&&(cl2[b]<4)&&(pd3[b]<4)&&(pb1[b]<4)){
        nm[7]=a; nm[58]=b;
        rw1[a]++; cl7[a]++; pd7[a]++; pb7[a]++;
        rw8[b]++; cl2[b]++; pd3[b]++; pb1[b]++;
        if(nm[6]+nm[7]+nm[62]+nm[63]==2){stp08();}
        rw1[a]--; cl7[a]--; pd7[a]--; pb7[a]--;
        rw8[b]--; cl2[b]--; pd3[b]--; pb1[b]--;
    }}
  }
}
/* Set n8 & n57 */
void stp08(){
 short a,b;
  for(a=1;a>=0;a--){b=CC-a;
    if((rw1[a]<4)&&(cl8[a]<4)&&(pd8[a]<4)&&(pb8[a]<4)){
      if((rw8[b]<4)&&(cl1[b]<4)&&(pd2[b]<4)&&(pb8[b]<4)){
        nm[8]=a; nm[57]=b;
        rw1[a]++; cl8[a]++; pd8[a]++; pb8[a]++;
        rw8[b]++; cl1[b]++; pd2[b]++; pb8[b]++;
        if(nm[63]+nm[64]+nm[7]+nm[8]==2){
          if(nm[64]+nm[57]+nm[1]+nm[8]==2){stp09();}}
        rw1[a]--; cl8[a]--; pd8[a]--; pb8[a]--;
        rw8[b]--; cl1[b]--; pd2[b]--; pb8[b]--;
    }}
  }
}
/* Set n9 & n56 */
void stp09(){
 short a,b;
  for(a=1;a>=0;a--){b=CC-a;
    if((rw2[a]<4)&&(cl1[a]<4)&&(pd8[a]<4)&&(pb2[a]<4)){
      if((rw7[b]<4)&&(cl8[b]<4)&&(pd2[b]<4)&&(pb6[b]<4)){
        nm[9]=a; nm[56]=b;
        rw2[a]++; cl1[a]++; pd8[a]++; pb2[a]++;
        rw7[b]++; cl8[b]++; pd2[b]++; pb6[b]++;
        stp10();
        rw2[a]--; cl1[a]--; pd8[a]--; pb2[a]--;
        rw7[b]--; cl8[b]--; pd2[b]--; pb6[b]--;
    }}
  }
}
```

```
/* Set n10 & n55 */
void stp10(){
 short a,b;
  for(a=0;a<2;a++){b=CC-a;
    if((rw2[a]<4)&&(cl2[a]<4)&&(pd1[a]<4)&&(pb3[a]<4)){
      if((rw7[b]<4)&&(cl7[b]<4)&&(pd1[b]<4)&&(pb5[b]<4)){
        nm[10]=a; nm[55]=b;
        rw2[a]++; cl2[a]++; pd1[a]++; pb3[a]++;
        rw7[b]++; cl7[b]++; pd1[b]++; pb5[b]++;
        if(nm[1]+nm[2]+nm[9]+nm[10]==2){stp11();}
        rw2[a]--; cl2[a]--; pd1[a]--; pb3[a]--;
        rw7[b]--; cl7[b]--; pd1[b]--; pb5[b]--;
    }}
  }
}
/* Set n11 & n47 */
void stp11(){
 short a,b;
  for(a=0;a<2;a++){b=CC-a;
    if((rw2[a]<4)&&(cl3[a]<4)&&(pd2[a]<4)&&(pb4[a]<4)){
      if((rw7[b]<4)&&(cl6[b]<4)&&(pd8[b]<4)&&(pb4[b]<4)){
        nm[11]=a; nm[54]=b;
        rw2[a]++; cl3[a]++; pd2[a]++; pb4[a]++;
        rw7[b]++; cl6[b]++; pd8[b]++; pb4[b]++;
        if(nm[2]+nm[3]+nm[10]+nm[11]==2){stp12();}
        rw2[a]--; cl3[a]--; pd2[a]--; pb4[a]--;
        rw7[b]--; cl6[b]--; pd8[b]--; pb4[b]--;
    }}
  }
}
/* Set n12 & n53 */
/* . . . . . . . */
/* Set n34 & n31 */
void stp31(){
 short a,b;
  for(a=0;a<2;a++){b=CC-a;
    if((rw5[a]<4)&&(cl2[a]<4)&&(pd6[a]<4)&&(pb6[a]<4)){
      if((rw4[b]<4)&&(cl7[b]<4)&&(pd4[b]<4)&&(pb2[b]<4)){
        nm[34]=a; nm[31]=b;
        rw5[a]++; cl2[a]++; pd6[a]++; pb6[a]++;
        rw4[b]++; cl7[b]++; pd4[b]++; pb2[b]++;
        if(nm[26]+nm[27]+a+nm[35]==2){
          if(nm[22]+nm[23]+nm[30]+b==2){stp32();}}
        rw5[a]--; cl2[a]--; pd6[a]--; pb6[a]--;
        rw4[b]--; cl7[b]--; pd4[b]--; pb2[b]--;
    }}
  }
}
/* Set n33 & n32 */
void stp32(){
 short a,b;
  for(a=0;a<2;a++){b=CC-a;
    if((rw5[a]<4)&&(cl1[a]<4)&&(pd5[a]<4)&&(pb5[a]<4)){
      if((rw4[b]<4)&&(cl8[b]<4)&&(pd5[b]<4)&&(pb3[b]<4)){
        nm[33]=a; nm[32]=b;
        rw5[a]++; cl1[a]++; pd5[a]++; pb5[a]++;
        rw4[b]++; cl8[b]++; pd5[b]++; pb3[b]++;
        if((nm[25]+nm[26]+a+nm[34]==2)&&(nm[23]+nm[24]+nm[31]+b==2)){stp33();}
        rw5[a]--; cl1[a]--; pd5[a]--; pb5[a]--;
        rw4[b]--; cl8[b]--; pd5[b]--; pb3[b]--;
    }}
  }
}
/* Check Small-Square-Sums */
```

```
void stp33(){
 short s1,s2;
  s1=nm[24]+nm[17]+nm[32]+nm[25]; s2=nm[40]+nm[33]+nm[48]+nm[41];
  if((s1==2)&&(s2==2)){recordans();}
}
/**/
/* Record the Answers */
void recordans(){
 short n;
  cnt++;
  tlu[cnt-1][0]=cnt;
  for(n=1;n<65;n++){tlu[cnt-1][n]=nm[n];}
}
/**/
/* Classify and Print the Latin Squares */
void prlunit(){
 short t,m,n,l;
 short l8;
  for(m=0;m<cnt;m++){
    for(n=0;n<cnt;n++){
      t=0;
      for(l=1;l<65;l++){if(tlu[m][l]==tlu[n][l]){t++;}}
      mtc[m][n]=t;
    }
  }
  for(t=0;t<cnt;t=t+6){
    printf("%9d/%9d/%9d/%9d/%9d/%9d/\n",
      t+1,t+2,t+3,t+4,t+5,t+6);
    for(l=0;l<8;l++){l8=l*8;
      for(m=t;m<(t+6);m++){
        printf("  ");
        for(n=1;n<9;n++){printf("%d",tlu[m][l8+n]);}
      }
      printf("\n");
    }
  }
  printf("\n [Reference Table of Matching Digits]\n");
  printf("  *|");
  for(n=0;n<cnt;n++){printf("%3d",n+1);}
  printf("\n");
  printf(" --+------------------------------------\n");
  for(m=0;m<cnt;m++){
    printf("%3d|",m+1);
    for(n=0;n<cnt;n++){t=mtc[m][n];
      if(t>=0){printf("%3d",t);}else{printf("  -");}}
    printf("\n");
  }
}
/**/
/* Combine and Compose */
void cmbcmp(){
 short lu,md,n,d,fc;
  lu=12; md=32;
  for(u1=0;u1<lu;u1++){
    for(u2=0;u2<lu;u2++){
      if(mtc[u2][u1]==md){cnt2=0;
      for(u3=0;u3<lu;u3++){
        if((mtc[u3][u1]==md)&&(mtc[u3][u2]==md)){
        for(u4=0;u4<lu;u4++){
          if((mtc[u4][u1]==md)&&(mtc[u4][u2]==md)&&(mtc[u4][u3]==md)){
          for(u5=0;u5<lu;u5++){
           if((mtc[u5][u1]==md)&&(mtc[u5][u2]==md)){
             if((mtc[u5][u3]==md)&&(mtc[u5][u4]==md)){
             for(u6=0;u6<lu;u6++){
```

```
              if((mtc[u6][u1]==md)&&(mtc[u6][u2]==md)&&(mtc[u6][u3]==md)){
               if((mtc[u6][u4]==md)&&(mtc[u6][u5]==md)){
                 for(n=1;n<65;n++){uflg[n]=0;}
                 for(n=1;n<65;n++){
                   d=tlu[u1][n]*32+tlu[u2][n]*16+tlu[u3][n]*8+tlu[u4][n]*4+tlu[u5][n]*2+tlu[u6][n]+1;
                   nm[n]=d; uflg[d]++;
                 }
                 fc=0;
                 for(n=1;n<65;n++){if(uflg[n]==1){fc++;}else{break;}}
                 if(fc==64){
                  if((nm[1]<nm[64])&&(nm[1]<nm[8])&&(nm[1]<nm[57])){
                   if(nm[2]>nm[9]){prans();}
                 }}
    }}}}}}}}}}}
  }
}
/**/
/* Print the Answers */
void prans(){
 short n;
  cnt++; cnt2++;
  if(nm[1]==1){cnt1++;
    if(cnt2==1){
      if(ltype==1){anspr();}
      else{
        anm[cnt3][0]=cnt;
        for(n=1;n<65;n++){anm[cnt3][n]=nm[n];}
        anm[cnt3][65]=u1+1; anm[cnt3][66]=u2+1; anm[cnt3][67]=u3+1;
        anm[cnt3][68]=u4+1; anm[cnt3][69]=u5+1; anm[cnt3][70]=u6+1;
        cnt3++;
        if(cnt3==3){ansxpr(cnt3); cnt3=0;}}
    }
  }
}
/**/
/* Print 3 Answers */
void ansxpr(short x){
  short l,l8,m,n;
    for(m=0;m<x;m++){
      printf("%4d/%2d/%2d/%2d/%2d/%2d/%4d#",
        anm[m][65],anm[m][66],anm[m][67],anm[m][68],anm[m][69],anm[m][70],anm[m][0]);
      if(m<(x-1)){printf(" ");}
    }
    printf("\n");
    for(l=0;l<8;l++){l8=l*8;
      for(m=0;m<x;m++){
        printf(" ");
        for(n=1;n<9;n++){printf("%3d",anm[m][l8+n]);}
        if(m<(x-1)){printf(" ");}
      }
      printf("\n");
    }
    printf("\n");
}
/**/
```

## 9-6. Result Report

```
** 'Complete Euler Squares' for 3-T Simultaneous Magic Squares **
**  of Order 8: Composite, Self-complementary and Pan-diagonal **
** Composed by 'New Euler's Method' with Binary Decompositions **
```

[Latin Squares of Binary Decompositions]

| 1/ | 2/ | 3/ | 4/ | 5/ | 6/ |
|---|---|---|---|---|---|
| 01010101 | 01010101 | 01010101 | 01011010 | 01100110 | 00111100 |
| 10101010 | 10101010 | 01010101 | 10100101 | 10011001 | 11000011 |
| 01010101 | 10101010 | 10101010 | 01011010 | 01100110 | 00111100 |
| 10101010 | 01010101 | 10101010 | 10100101 | 10011001 | 11000011 |
| 10101010 | 01010101 | 10101010 | 01011010 | 01100110 | 00111100 |
| 01010101 | 10101010 | 10101010 | 10100101 | 10011001 | 11000011 |
| 10101010 | 10101010 | 01010101 | 01011010 | 01100110 | 00111100 |
| 01010101 | 01010101 | 01010101 | 10100101 | 10011001 | 11000011 |
| 7/ | 8/ | 9/ | 10/ | 11/ | 12/ |
| 11000011 | 10011001 | 10100101 | 10101010 | 10101010 | 10101010 |
| 00111100 | 01100110 | 01011010 | 10101010 | 01010101 | 01010101 |
| 11000011 | 10011001 | 10100101 | 01010101 | 01010101 | 10101010 |
| 00111100 | 01100110 | 01011010 | 01010101 | 10101010 | 01010101 |
| 11000011 | 10011001 | 10100101 | 01010101 | 10101010 | 01010101 |
| 00111100 | 01100110 | 01011010 | 01010101 | 01010101 | 10101010 |
| 11000011 | 10011001 | 10100101 | 10101010 | 01010101 | 01010101 |
| 00111100 | 01100110 | 01011010 | 10101010 | 10101010 | 10101010 |

[Reference Table of Matching Digits]

| * | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 64 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 0 |
| 2 | 32 | 64 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 0 | 32 |
| 3 | 32 | 32 | 64 | 32 | 32 | 32 | 32 | 32 | 32 | 0 | 32 | 32 |
| 4 | 32 | 32 | 32 | 64 | 32 | 32 | 32 | 32 | 0 | 32 | 32 | 32 |
| 5 | 32 | 32 | 32 | 32 | 64 | 32 | 32 | 0 | 32 | 32 | 32 | 32 |
| 6 | 32 | 32 | 32 | 32 | 32 | 64 | 0 | 32 | 32 | 32 | 32 | 32 |
| 7 | 32 | 32 | 32 | 32 | 32 | 0 | 64 | 32 | 32 | 32 | 32 | 32 |
| 8 | 32 | 32 | 32 | 32 | 0 | 32 | 32 | 64 | 32 | 32 | 32 | 32 |
| 9 | 32 | 32 | 32 | 0 | 32 | 32 | 32 | 32 | 64 | 32 | 32 | 32 |
| 10 | 32 | 32 | 0 | 32 | 32 | 32 | 32 | 32 | 32 | 64 | 32 | 32 |
| 11 | 32 | 0 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 64 | 32 |
| 12 | 0 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 64 |

[Compositions of C.E.S. for 3-T Simultaneous MS88: Used Units////// S.No#]

| 1/ | 2/ | 3/ | 4/ | 5/ | 6/ | | | | | | | | 1# |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01010101 | 01010101 | 01010101 | 01011010 | 01100110 | 00111100 | 1 | 63 | 4 | 62 | 6 | 60 | 7 | 57 |
| 10101010 | 10101010 | 01010101 | 10100101 | 10011001 | 11000011 | 56 | 10 | 53 | 11 | 51 | 13 | 50 | 16 |
| 01010101 | 10101010 | 10101010 | 01011010 | 01100110 | 00111100 | 25 | 39 | 28 | 38 | 30 | 36 | 31 | 33 |
| 10101010 | 01010101 | 10101010 | 10100101 | 10011001 | 11000011 | 48 | 18 | 45 | 19 | 43 | 21 | 42 | 24 |
| 10101010 | 01010101 | 10101010 | 01011010 | 01100110 | 00111100 | 41 | 23 | 44 | 22 | 46 | 20 | 47 | 17 |
| 01010101 | 10101010 | 10101010 | 10100101 | 10011001 | 11000011 | 32 | 34 | 29 | 35 | 27 | 37 | 26 | 40 |
| 10101010 | 10101010 | 01010101 | 01011010 | 01100110 | 00111100 | 49 | 15 | 52 | 14 | 54 | 12 | 55 | 9 |
| 01010101 | 01010101 | 01010101 | 10100101 | 10011001 | 11000011 | 8 | 58 | 5 | 59 | 3 | 61 | 2 | 64 |

| 1/ | 2/ | 3/ | 4/ | 6/ | 5/ | | | | | | | | 3# |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01010101 | 01010101 | 01010101 | 01011010 | 00111100 | 01100110 | 1 | 62 | 4 | 63 | 7 | 60 | 6 | 57 |
| 10101010 | 10101010 | 01010101 | 10100101 | 11000011 | 10011001 | 56 | 11 | 53 | 10 | 50 | 13 | 51 | 16 |
| 01010101 | 10101010 | 10101010 | 01011010 | 00111100 | 01100110 | 25 | 38 | 28 | 39 | 31 | 36 | 30 | 33 |
| 10101010 | 01010101 | 10101010 | 10100101 | 11000011 | 10011001 | 48 | 19 | 45 | 18 | 42 | 21 | 43 | 24 |
| 10101010 | 01010101 | 10101010 | 01011010 | 00111100 | 01100110 | 41 | 22 | 44 | 23 | 47 | 20 | 46 | 17 |
| 01010101 | 10101010 | 10101010 | 10100101 | 11000011 | 10011001 | 32 | 35 | 29 | 34 | 26 | 37 | 27 | 40 |
| 10101010 | 10101010 | 01010101 | 01011010 | 00111100 | 01100110 | 49 | 14 | 52 | 15 | 55 | 12 | 54 | 9 |
| 01010101 | 01010101 | 01010101 | 10100101 | 11000011 | 10011001 | 8 | 59 | 5 | 58 | 2 | 61 | 3 | 64 |

| 1/ | 2/ | 3/ | 5/ | 4/ | 6/ | | | | | | | | 9# |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01010101 | 01010101 | 01010101 | 01100110 | 01011010 | 00111100 | 1 | 63 | 6 | 60 | 4 | 62 | 7 | 57 |
| 10101010 | 10101010 | 01010101 | 10011001 | 10100101 | 11000011 | 56 | 10 | 51 | 13 | 53 | 11 | 50 | 16 |
| 01010101 | 10101010 | 10101010 | 01100110 | 01011010 | 00111100 | 25 | 39 | 30 | 36 | 28 | 38 | 31 | 33 |
| 10101010 | 01010101 | 10101010 | 10011001 | 10100101 | 11000011 | 48 | 18 | 43 | 21 | 45 | 19 | 42 | 24 |
| 10101010 | 01010101 | 10101010 | 01100110 | 01011010 | 00111100 | 41 | 23 | 46 | 20 | 44 | 22 | 47 | 17 |
| 01010101 | 10101010 | 10101010 | 10011001 | 10100101 | 11000011 | 32 | 34 | 27 | 37 | 29 | 35 | 26 | 40 |
| 10101010 | 10101010 | 01010101 | 01100110 | 01011010 | 00111100 | 49 | 15 | 54 | 12 | 52 | 14 | 55 | 9 |
| 01010101 | 01010101 | 01010101 | 10011001 | 10100101 | 11000011 | 8 | 58 | 3 | 61 | 5 | 59 | 2 | 64 |

| 1/ | 2/ | 3/ | 5/ | 6/ | 4/ | | | | | | | | 11# |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01010101 | 01010101 | 01010101 | 01100110 | 00111100 | 01011010 | 1 | 62 | 7 | 60 | 4 | 63 | 6 | 57 |
| 10101010 | 10101010 | 01010101 | 10011001 | 11000011 | 10100101 | 56 | 11 | 50 | 13 | 53 | 10 | 51 | 16 |
| 01010101 | 10101010 | 10101010 | 01100110 | 00111100 | 01011010 | 25 | 38 | 31 | 36 | 28 | 39 | 30 | 33 |
| 10101010 | 01010101 | 10101010 | 10011001 | 11000011 | 10100101 | 48 | 19 | 42 | 21 | 45 | 18 | 43 | 24 |
| 10101010 | 01010101 | 10101010 | 01100110 | 00111100 | 01011010 | 41 | 22 | 47 | 20 | 44 | 23 | 46 | 17 |
| 01010101 | 10101010 | 10101010 | 10011001 | 11000011 | 10100101 | 32 | 35 | 26 | 37 | 29 | 34 | 27 | 40 |
| 10101010 | 10101010 | 01010101 | 01100110 | 00111100 | 01011010 | 49 | 14 | 55 | 12 | 52 | 15 | 54 | 9 |
| 01010101 | 01010101 | 01010101 | 10011001 | 11000011 | 10100101 | 8 | 59 | 2 | 61 | 5 | 58 | 3 | 64 |

| 1/ | 2/ | 3/ | 6/ | 4/ | 5/ | | | | | | | | 17# |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01010101 | 01010101 | 01010101 | 00111100 | 01011010 | 01100110 | 1 | 60 | 6 | 63 | 7 | 62 | 4 | 57 |
| 10101010 | 10101010 | 01010101 | 11000011 | 10100101 | 10011001 | 56 | 13 | 51 | 10 | 50 | 11 | 53 | 16 |
| 01010101 | 10101010 | 10101010 | 00111100 | 01011010 | 01100110 | 25 | 36 | 30 | 39 | 31 | 38 | 28 | 33 |
| 10101010 | 01010101 | 10101010 | 11000011 | 10100101 | 10011001 | 48 | 21 | 43 | 18 | 42 | 19 | 45 | 24 |
| 10101010 | 01010101 | 10101010 | 00111100 | 01011010 | 01100110 | 41 | 20 | 46 | 23 | 47 | 22 | 44 | 17 |
| 01010101 | 10101010 | 10101010 | 11000011 | 10100101 | 10011001 | 32 | 37 | 27 | 34 | 26 | 35 | 29 | 40 |
| 10101010 | 10101010 | 01010101 | 00111100 | 01011010 | 01100110 | 49 | 12 | 54 | 15 | 55 | 14 | 52 | 9 |
| 01010101 | 01010101 | 01010101 | 11000011 | 10100101 | 10011001 | 8 | 61 | 3 | 58 | 2 | 59 | 5 | 64 |

| 1/ | 2/ | 3/ | 6/ | 5/ | 4/ | | | | | | | | 19# |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01010101 | 01010101 | 01010101 | 00111100 | 01100110 | 01011010 | 1 | 60 | 7 | 62 | 6 | 63 | 4 | 57 |
| 10101010 | 10101010 | 01010101 | 11000011 | 10011001 | 10100101 | 56 | 13 | 50 | 11 | 51 | 10 | 53 | 16 |
| 01010101 | 10101010 | 10101010 | 00111100 | 01100110 | 01011010 | 25 | 36 | 31 | 38 | 30 | 39 | 28 | 33 |
| 10101010 | 01010101 | 10101010 | 11000011 | 10011001 | 10100101 | 48 | 21 | 42 | 19 | 43 | 18 | 45 | 24 |
| 10101010 | 01010101 | 10101010 | 00111100 | 01100110 | 01011010 | 41 | 20 | 47 | 22 | 46 | 23 | 44 | 17 |
| 01010101 | 10101010 | 10101010 | 11000011 | 10011001 | 10100101 | 32 | 37 | 26 | 35 | 27 | 34 | 29 | 40 |
| 10101010 | 10101010 | 01010101 | 00111100 | 01100110 | 01011010 | 49 | 12 | 55 | 14 | 54 | 15 | 52 | 9 |
| 01010101 | 01010101 | 01010101 | 11000011 | 10011001 | 10100101 | 8 | 61 | 2 | 59 | 3 | 58 | 5 | 64 |

| 1/ | 2/ | 4/ | 3/ | 5/ | 6/ | | 25# |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 4 | 62 | 10 | 56 | 11 | 53 |
| 60 | 6 | 57 | 7 | 51 | 13 | 50 | 16 |
| 21 | 43 | 24 | 42 | 30 | 36 | 31 | 33 |
| 48 | 18 | 45 | 19 | 39 | 25 | 38 | 28 |
| 37 | 27 | 40 | 26 | 46 | 20 | 47 | 17 |
| 32 | 34 | 29 | 35 | 23 | 41 | 22 | 44 |
| 49 | 15 | 52 | 14 | 58 | 8 | 59 | 5 |
| 12 | 54 | 9 | 55 | 3 | 61 | 2 | 64 |

| 1/ | 2/ | 4/ | 5/ | 3/ | 6/ | | 33# |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 6 | 60 | 10 | 56 | 13 | 51 |
| 62 | 4 | 57 | 7 | 53 | 11 | 50 | 16 |
| 19 | 45 | 24 | 42 | 28 | 38 | 31 | 33 |
| 48 | 18 | 43 | 21 | 39 | 25 | 36 | 30 |
| 35 | 29 | 40 | 26 | 44 | 22 | 47 | 17 |
| 32 | 34 | 27 | 37 | 23 | 41 | 20 | 46 |
| 49 | 15 | 54 | 12 | 58 | 8 | 61 | 3 |
| 14 | 52 | 9 | 55 | 5 | 59 | 2 | 64 |

| 1/ | 2/ | 5/ | 3/ | 4/ | 6/ | | 49# |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 10 | 56 | 4 | 62 | 11 | 53 |
| 60 | 6 | 51 | 13 | 57 | 7 | 50 | 16 |
| 21 | 43 | 30 | 36 | 24 | 42 | 31 | 33 |
| 48 | 18 | 39 | 25 | 45 | 19 | 38 | 28 |
| 37 | 27 | 46 | 20 | 40 | 26 | 47 | 17 |
| 32 | 34 | 23 | 41 | 29 | 35 | 22 | 44 |
| 49 | 15 | 58 | 8 | 52 | 14 | 59 | 5 |
| 12 | 54 | 3 | 61 | 9 | 55 | 2 | 64 |

| 1/ | 2/ | 5/ | 4/ | 3/ | 6/ | | 57# |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 10 | 56 | 6 | 60 | 13 | 51 |
| 62 | 4 | 53 | 11 | 57 | 7 | 50 | 16 |
| 19 | 45 | 28 | 38 | 24 | 42 | 31 | 33 |
| 48 | 18 | 39 | 25 | 43 | 21 | 36 | 30 |
| 35 | 29 | 44 | 22 | 40 | 26 | 47 | 17 |
| 32 | 34 | 23 | 41 | 27 | 37 | 20 | 46 |
| 49 | 15 | 58 | 8 | 54 | 12 | 61 | 3 |
| 14 | 52 | 5 | 59 | 9 | 55 | 2 | 64 |

| 1/ | 3/ | 2/ | 4/ | 5/ | 6/ | | 73# |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 4 | 62 | 6 | 60 | 7 | 57 |
| 48 | 18 | 45 | 19 | 43 | 21 | 42 | 24 |
| 25 | 39 | 28 | 38 | 30 | 36 | 31 | 33 |
| 56 | 10 | 53 | 11 | 51 | 13 | 50 | 16 |
| 49 | 15 | 52 | 14 | 54 | 12 | 55 | 9 |
| 32 | 34 | 29 | 35 | 27 | 37 | 26 | 40 |
| 41 | 23 | 44 | 22 | 46 | 20 | 47 | 17 |
| 8 | 58 | 5 | 59 | 3 | 61 | 2 | 64 |

| 1/ | 3/ | 2/ | 5/ | 4/ | 6/ | | 81# |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 6 | 60 | 4 | 62 | 7 | 57 |
| 48 | 18 | 43 | 21 | 45 | 19 | 42 | 24 |
| 25 | 39 | 30 | 36 | 28 | 38 | 31 | 33 |
| 56 | 10 | 51 | 13 | 53 | 11 | 50 | 16 |
| 49 | 15 | 54 | 12 | 52 | 14 | 55 | 9 |
| 32 | 34 | 27 | 37 | 29 | 35 | 26 | 40 |
| 41 | 23 | 46 | 20 | 44 | 22 | 47 | 17 |
| 8 | 58 | 3 | 61 | 5 | 59 | 2 | 64 |

| 1/ | 3/ | 2/ | 6/ | 4/ | 5/ | | 89# |
|---|---|---|---|---|---|---|---|
| 1 | 60 | 6 | 63 | 7 | 62 | 4 | 57 |
| 48 | 21 | 43 | 18 | 42 | 19 | 45 | 24 |
| 25 | 36 | 30 | 39 | 31 | 38 | 28 | 33 |
| 56 | 13 | 51 | 10 | 50 | 11 | 53 | 16 |
| 49 | 12 | 54 | 15 | 55 | 14 | 52 | 9 |
| 32 | 37 | 27 | 34 | 26 | 35 | 29 | 40 |
| 41 | 20 | 46 | 23 | 47 | 22 | 44 | 17 |
| 8 | 61 | 3 | 58 | 2 | 59 | 5 | 64 |

| 1/ | 3/ | 4/ | 2/ | 5/ | 6/ | | 97# |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 4 | 62 | 10 | 56 | 11 | 53 |
| 48 | 18 | 45 | 19 | 39 | 25 | 38 | 28 |
| 21 | 43 | 24 | 42 | 30 | 36 | 31 | 33 |
| 60 | 6 | 57 | 7 | 51 | 13 | 50 | 16 |
| 49 | 15 | 52 | 14 | 58 | 8 | 59 | 5 |
| 32 | 34 | 29 | 35 | 23 | 41 | 22 | 44 |
| 37 | 27 | 40 | 26 | 46 | 20 | 47 | 17 |
| 12 | 54 | 9 | 55 | 3 | 61 | 2 | 64 |

| 1/ | 3/ | 4/ | 5/ | 2/ | 6/ | | 105# |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 6 | 60 | 10 | 56 | 13 | 51 |
| 48 | 18 | 43 | 21 | 39 | 25 | 36 | 30 |
| 19 | 45 | 24 | 42 | 28 | 38 | 31 | 33 |
| 62 | 4 | 57 | 7 | 53 | 11 | 50 | 16 |
| 49 | 15 | 54 | 12 | 58 | 8 | 61 | 3 |
| 32 | 34 | 27 | 37 | 23 | 41 | 20 | 46 |
| 35 | 29 | 40 | 26 | 44 | 22 | 47 | 17 |
| 14 | 52 | 9 | 55 | 5 | 59 | 2 | 64 |

1/ 3/ 4/ 6/ 2/ 5/ 113#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 60 | 6 | 63 | 13 | 56 | 10 | 51 |
| 48 | 21 | 43 | 18 | 36 | 25 | 39 | 30 |
| 19 | 42 | 24 | 45 | 31 | 38 | 28 | 33 |
| 62 | 7 | 57 | 4 | 50 | 11 | 53 | 16 |
| 49 | 12 | 54 | 15 | 61 | 8 | 58 | 3 |
| 32 | 37 | 27 | 34 | 20 | 41 | 23 | 46 |
| 35 | 26 | 40 | 29 | 47 | 22 | 44 | 17 |
| 14 | 55 | 9 | 52 | 2 | 59 | 5 | 64 |

1/ 3/ 5/ 2/ 4/ 6/ 145#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 10 | 56 | 4 | 62 | 11 | 53 |
| 48 | 18 | 39 | 25 | 45 | 19 | 38 | 28 |
| 21 | 43 | 30 | 36 | 24 | 42 | 31 | 33 |
| 60 | 6 | 51 | 13 | 57 | 7 | 50 | 16 |
| 49 | 15 | 58 | 8 | 52 | 14 | 59 | 5 |
| 32 | 34 | 23 | 41 | 29 | 35 | 22 | 44 |
| 37 | 27 | 46 | 20 | 40 | 26 | 47 | 17 |
| 12 | 54 | 3 | 61 | 9 | 55 | 2 | 64 |

1/ 3/ 5/ 4/ 2/ 6/ 153#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 10 | 56 | 6 | 60 | 13 | 51 |
| 48 | 18 | 39 | 25 | 43 | 21 | 36 | 30 |
| 19 | 45 | 28 | 38 | 24 | 42 | 31 | 33 |
| 62 | 4 | 53 | 11 | 57 | 7 | 50 | 16 |
| 49 | 15 | 58 | 8 | 54 | 12 | 61 | 3 |
| 32 | 34 | 23 | 41 | 27 | 37 | 20 | 46 |
| 35 | 29 | 44 | 22 | 40 | 26 | 47 | 17 |
| 14 | 52 | 5 | 59 | 9 | 55 | 2 | 64 |

1/ 3/ 5/ 6/ 2/ 4/ 161#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 60 | 13 | 56 | 6 | 63 | 10 | 51 |
| 48 | 21 | 36 | 25 | 43 | 18 | 39 | 30 |
| 19 | 42 | 31 | 38 | 24 | 45 | 28 | 33 |
| 62 | 7 | 50 | 11 | 57 | 4 | 53 | 16 |
| 49 | 12 | 61 | 8 | 54 | 15 | 58 | 3 |
| 32 | 37 | 20 | 41 | 27 | 34 | 23 | 46 |
| 35 | 26 | 47 | 22 | 40 | 29 | 44 | 17 |
| 14 | 55 | 2 | 59 | 9 | 52 | 5 | 64 |

1/ 3/ 6/ 2/ 4/ 5/ 193#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 56 | 10 | 63 | 11 | 62 | 4 | 53 |
| 48 | 25 | 39 | 18 | 38 | 19 | 45 | 28 |
| 21 | 36 | 30 | 43 | 31 | 42 | 24 | 33 |
| 60 | 13 | 51 | 6 | 50 | 7 | 57 | 16 |
| 49 | 8 | 58 | 15 | 59 | 14 | 52 | 5 |
| 32 | 41 | 23 | 34 | 22 | 35 | 29 | 44 |
| 37 | 20 | 46 | 27 | 47 | 26 | 40 | 17 |
| 12 | 61 | 3 | 54 | 2 | 55 | 9 | 64 |

1/ 3/ 6/ 4/ 2/ 5/ 201#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 56 | 10 | 63 | 13 | 60 | 6 | 51 |
| 48 | 25 | 39 | 18 | 36 | 21 | 43 | 30 |
| 19 | 38 | 28 | 45 | 31 | 42 | 24 | 33 |
| 62 | 11 | 53 | 4 | 50 | 7 | 57 | 16 |
| 49 | 8 | 58 | 15 | 61 | 12 | 54 | 3 |
| 32 | 41 | 23 | 34 | 20 | 37 | 27 | 46 |
| 35 | 22 | 44 | 29 | 47 | 26 | 40 | 17 |
| 14 | 59 | 5 | 52 | 2 | 55 | 9 | 64 |

1/ 3/ 6/ 5/ 2/ 4/ 209#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 56 | 13 | 60 | 10 | 63 | 6 | 51 |
| 48 | 25 | 36 | 21 | 39 | 18 | 43 | 30 |
| 19 | 38 | 31 | 42 | 28 | 45 | 24 | 33 |
| 62 | 11 | 50 | 7 | 53 | 4 | 57 | 16 |
| 49 | 8 | 61 | 12 | 58 | 15 | 54 | 3 |
| 32 | 41 | 20 | 37 | 23 | 34 | 27 | 46 |
| 35 | 22 | 47 | 26 | 44 | 29 | 40 | 17 |
| 14 | 59 | 2 | 55 | 5 | 52 | 9 | 64 |

1/ 4/ 2/ 3/ 5/ 6/ 265#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 4 | 62 | 18 | 48 | 19 | 45 |
| 60 | 6 | 57 | 7 | 43 | 21 | 42 | 24 |
| 13 | 51 | 16 | 50 | 30 | 36 | 31 | 33 |
| 56 | 10 | 53 | 11 | 39 | 25 | 38 | 28 |
| 37 | 27 | 40 | 26 | 54 | 12 | 55 | 9 |
| 32 | 34 | 29 | 35 | 15 | 49 | 14 | 52 |
| 41 | 23 | 44 | 22 | 58 | 8 | 59 | 5 |
| 20 | 46 | 17 | 47 | 3 | 61 | 2 | 64 |

1/ 4/ 2/ 5/ 3/ 6/ 273#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 6 | 60 | 18 | 48 | 21 | 43 |
| 62 | 4 | 57 | 7 | 45 | 19 | 42 | 24 |
| 11 | 53 | 16 | 50 | 28 | 38 | 31 | 33 |
| 56 | 10 | 51 | 13 | 39 | 25 | 36 | 30 |
| 35 | 29 | 40 | 26 | 52 | 14 | 55 | 9 |
| 32 | 34 | 27 | 37 | 15 | 49 | 12 | 54 |
| 41 | 23 | 46 | 20 | 58 | 8 | 61 | 3 |
| 22 | 44 | 17 | 47 | 5 | 59 | 2 | 64 |

1/ 4/ 3/ 2/ 5/ 6/ 289#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 4 | 62 | 18 | 48 | 19 | 45 |
| 56 | 10 | 53 | 11 | 39 | 25 | 38 | 28 |
| 13 | 51 | 16 | 50 | 30 | 36 | 31 | 33 |
| 60 | 6 | 57 | 7 | 43 | 21 | 42 | 24 |
| 41 | 23 | 44 | 22 | 58 | 8 | 59 | 5 |
| 32 | 34 | 29 | 35 | 15 | 49 | 14 | 52 |
| 37 | 27 | 40 | 26 | 54 | 12 | 55 | 9 |
| 20 | 46 | 17 | 47 | 3 | 61 | 2 | 64 |

1/ 4/ 3/ 5/ 2/ 6/ 297#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 6 | 60 | 18 | 48 | 21 | 43 |
| 56 | 10 | 51 | 13 | 39 | 25 | 36 | 30 |
| 11 | 53 | 16 | 50 | 28 | 38 | 31 | 33 |
| 62 | 4 | 57 | 7 | 45 | 19 | 42 | 24 |
| 41 | 23 | 46 | 20 | 58 | 8 | 61 | 3 |
| 32 | 34 | 27 | 37 | 15 | 49 | 12 | 54 |
| 35 | 29 | 40 | 26 | 52 | 14 | 55 | 9 |
| 22 | 44 | 17 | 47 | 5 | 59 | 2 | 64 |

1/ 4/ 3/ 6/ 2/ 5/ 305#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 60 | 6 | 63 | 21 | 48 | 18 | 43 |
| 56 | 13 | 51 | 10 | 36 | 25 | 39 | 30 |
| 11 | 50 | 16 | 53 | 31 | 38 | 28 | 33 |
| 62 | 7 | 57 | 4 | 42 | 19 | 45 | 24 |
| 41 | 20 | 46 | 23 | 61 | 8 | 58 | 3 |
| 32 | 37 | 27 | 34 | 12 | 49 | 15 | 54 |
| 35 | 26 | 40 | 29 | 55 | 14 | 52 | 9 |
| 22 | 47 | 17 | 44 | 2 | 59 | 5 | 64 |

1/ 4/ 5/ 2/ 3/ 6/ 337#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 10 | 56 | 18 | 48 | 25 | 39 |
| 62 | 4 | 53 | 11 | 45 | 19 | 38 | 28 |
| 7 | 57 | 16 | 50 | 24 | 42 | 31 | 33 |
| 60 | 6 | 51 | 13 | 43 | 21 | 36 | 30 |
| 35 | 29 | 44 | 22 | 52 | 14 | 59 | 5 |
| 32 | 34 | 23 | 41 | 15 | 49 | 8 | 58 |
| 37 | 27 | 46 | 20 | 54 | 12 | 61 | 3 |
| 26 | 40 | 17 | 47 | 9 | 55 | 2 | 64 |

1/ 5/ 2/ 3/ 4/ 6/ 457#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 18 | 48 | 4 | 62 | 19 | 45 |
| 60 | 6 | 43 | 21 | 57 | 7 | 42 | 24 |
| 13 | 51 | 30 | 36 | 16 | 50 | 31 | 33 |
| 56 | 10 | 39 | 25 | 53 | 11 | 38 | 28 |
| 37 | 27 | 54 | 12 | 40 | 26 | 55 | 9 |
| 32 | 34 | 15 | 49 | 29 | 35 | 14 | 52 |
| 41 | 23 | 58 | 8 | 44 | 22 | 59 | 5 |
| 20 | 46 | 3 | 61 | 17 | 47 | 2 | 64 |

1/ 5/ 3/ 2/ 4/ 6/ 481#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 18 | 48 | 4 | 62 | 19 | 45 |
| 56 | 10 | 39 | 25 | 53 | 11 | 38 | 28 |
| 13 | 51 | 30 | 36 | 16 | 50 | 31 | 33 |
| 60 | 6 | 43 | 21 | 57 | 7 | 42 | 24 |
| 41 | 23 | 58 | 8 | 44 | 22 | 59 | 5 |
| 32 | 34 | 15 | 49 | 29 | 35 | 14 | 52 |
| 37 | 27 | 54 | 12 | 40 | 26 | 55 | 9 |
| 20 | 46 | 3 | 61 | 17 | 47 | 2 | 64 |

1/ 5/ 4/ 2/ 3/ 6/ 529#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 18 | 48 | 10 | 56 | 25 | 39 |
| 62 | 4 | 45 | 19 | 53 | 11 | 38 | 28 |
| 7 | 57 | 24 | 42 | 16 | 50 | 31 | 33 |
| 60 | 6 | 43 | 21 | 51 | 13 | 36 | 30 |
| 35 | 29 | 52 | 14 | 44 | 22 | 59 | 5 |
| 32 | 34 | 15 | 49 | 23 | 41 | 8 | 58 |
| 37 | 27 | 54 | 12 | 46 | 20 | 61 | 3 |
| 26 | 40 | 9 | 55 | 17 | 47 | 2 | 64 |

2/ 1/ 3/ 4/ 5/ 6/ 721#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 4 | 62 | 6 | 60 | 7 | 57 |
| 56 | 10 | 53 | 11 | 51 | 13 | 50 | 16 |
| 41 | 23 | 44 | 22 | 46 | 20 | 47 | 17 |
| 32 | 34 | 29 | 35 | 27 | 37 | 26 | 40 |
| 25 | 39 | 28 | 38 | 30 | 36 | 31 | 33 |
| 48 | 18 | 45 | 19 | 43 | 21 | 42 | 24 |
| 49 | 15 | 52 | 14 | 54 | 12 | 55 | 9 |
| 8 | 58 | 5 | 59 | 3 | 61 | 2 | 64 |

2/ 1/ 4/ 3/ 5/ 6/ 745#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 4 | 62 | 10 | 56 | 11 | 53 |
| 60 | 6 | 57 | 7 | 51 | 13 | 50 | 16 |
| 37 | 27 | 40 | 26 | 46 | 20 | 47 | 17 |
| 32 | 34 | 29 | 35 | 23 | 41 | 22 | 44 |
| 21 | 43 | 24 | 42 | 30 | 36 | 31 | 33 |
| 48 | 18 | 45 | 19 | 39 | 25 | 38 | 28 |
| 49 | 15 | 52 | 14 | 58 | 8 | 59 | 5 |
| 12 | 54 | 9 | 55 | 3 | 61 | 2 | 64 |

2/ 1/ 5/ 3/ 4/ 6/ 769#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 10 | 56 | 4 | 62 | 11 | 53 |
| 60 | 6 | 51 | 13 | 57 | 7 | 50 | 16 |
| 37 | 27 | 46 | 20 | 40 | 26 | 47 | 17 |
| 32 | 34 | 23 | 41 | 29 | 35 | 22 | 44 |
| 21 | 43 | 30 | 36 | 24 | 42 | 31 | 33 |
| 48 | 18 | 39 | 25 | 45 | 19 | 38 | 28 |
| 49 | 15 | 58 | 8 | 52 | 14 | 59 | 5 |
| 12 | 54 | 3 | 61 | 9 | 55 | 2 | 64 |

2/ 3/ 1/ 4/ 5/ 6/ 793#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 4 | 62 | 6 | 60 | 7 | 57 |
| 48 | 18 | 45 | 19 | 43 | 21 | 42 | 24 |
| 49 | 15 | 52 | 14 | 54 | 12 | 55 | 9 |
| 32 | 34 | 29 | 35 | 27 | 37 | 26 | 40 |
| 25 | 39 | 28 | 38 | 30 | 36 | 31 | 33 |
| 56 | 10 | 53 | 11 | 51 | 13 | 50 | 16 |
| 41 | 23 | 44 | 22 | 46 | 20 | 47 | 17 |
| 8 | 58 | 5 | 59 | 3 | 61 | 2 | 64 |

2/ 3/ 4/ 1/ 5/ 6/ 817#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 4 | 62 | 10 | 56 | 11 | 53 |
| 48 | 18 | 45 | 19 | 39 | 25 | 38 | 28 |
| 49 | 15 | 52 | 14 | 58 | 8 | 59 | 5 |
| 32 | 34 | 29 | 35 | 23 | 41 | 22 | 44 |
| 21 | 43 | 24 | 42 | 30 | 36 | 31 | 33 |
| 60 | 6 | 57 | 7 | 51 | 13 | 50 | 16 |
| 37 | 27 | 40 | 26 | 46 | 20 | 47 | 17 |
| 12 | 54 | 9 | 55 | 3 | 61 | 2 | 64 |

2/ 3/ 5/ 1/ 4/ 6/ 865#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 10 | 56 | 4 | 62 | 11 | 53 |
| 48 | 18 | 39 | 25 | 45 | 19 | 38 | 28 |
| 49 | 15 | 58 | 8 | 52 | 14 | 59 | 5 |
| 32 | 34 | 23 | 41 | 29 | 35 | 22 | 44 |
| 21 | 43 | 30 | 36 | 24 | 42 | 31 | 33 |
| 60 | 6 | 51 | 13 | 57 | 7 | 50 | 16 |
| 37 | 27 | 46 | 20 | 40 | 26 | 47 | 17 |
| 12 | 54 | 3 | 61 | 9 | 55 | 2 | 64 |

2/ 3/ 6/ 1/ 4/ 5/ 913#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 56 | 10 | 63 | 11 | 62 | 4 | 53 |
| 48 | 25 | 39 | 18 | 38 | 19 | 45 | 28 |
| 49 | 8 | 58 | 15 | 59 | 14 | 52 | 5 |
| 32 | 41 | 23 | 34 | 22 | 35 | 29 | 44 |
| 21 | 36 | 30 | 43 | 31 | 42 | 24 | 33 |
| 60 | 13 | 51 | 6 | 50 | 7 | 57 | 16 |
| 37 | 20 | 46 | 27 | 47 | 26 | 40 | 17 |
| 12 | 61 | 3 | 54 | 2 | 55 | 9 | 64 |

2/ 4/ 1/ 3/ 5/ 6/ 985#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 4 | 62 | 18 | 48 | 19 | 45 |
| 60 | 6 | 57 | 7 | 43 | 21 | 42 | 24 |
| 37 | 27 | 40 | 26 | 54 | 12 | 55 | 9 |
| 32 | 34 | 29 | 35 | 15 | 49 | 14 | 52 |
| 13 | 51 | 16 | 50 | 30 | 36 | 31 | 33 |
| 56 | 10 | 53 | 11 | 39 | 25 | 38 | 28 |
| 41 | 23 | 44 | 22 | 58 | 8 | 59 | 5 |
| 20 | 46 | 17 | 47 | 3 | 61 | 2 | 64 |

2/ 4/ 3/ 1/ 5/ 6/1009#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 4 | 62 | 18 | 48 | 19 | 45 |
| 56 | 10 | 53 | 11 | 39 | 25 | 38 | 28 |
| 41 | 23 | 44 | 22 | 58 | 8 | 59 | 5 |
| 32 | 34 | 29 | 35 | 15 | 49 | 14 | 52 |
| 13 | 51 | 16 | 50 | 30 | 36 | 31 | 33 |
| 60 | 6 | 57 | 7 | 43 | 21 | 42 | 24 |
| 37 | 27 | 40 | 26 | 54 | 12 | 55 | 9 |
| 20 | 46 | 17 | 47 | 3 | 61 | 2 | 64 |

2/ 4/ 5/ 1/ 3/ 6/1057#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 10 | 56 | 18 | 48 | 25 | 39 |
| 62 | 4 | 53 | 11 | 45 | 19 | 38 | 28 |
| 35 | 29 | 44 | 22 | 52 | 14 | 59 | 5 |
| 32 | 34 | 23 | 41 | 15 | 49 | 8 | 58 |
| 7 | 57 | 16 | 50 | 24 | 42 | 31 | 33 |
| 60 | 6 | 51 | 13 | 43 | 21 | 36 | 30 |
| 37 | 27 | 46 | 20 | 54 | 12 | 61 | 3 |
| 26 | 40 | 17 | 47 | 9 | 55 | 2 | 64 |

2/ 5/ 1/ 3/ 4/ 6/1177#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 18 | 48 | 4 | 62 | 19 | 45 |
| 60 | 6 | 43 | 21 | 57 | 7 | 42 | 24 |
| 37 | 27 | 54 | 12 | 40 | 26 | 55 | 9 |
| 32 | 34 | 15 | 49 | 29 | 35 | 14 | 52 |
| 13 | 51 | 30 | 36 | 16 | 50 | 31 | 33 |
| 56 | 10 | 39 | 25 | 53 | 11 | 38 | 28 |
| 41 | 23 | 58 | 8 | 44 | 22 | 59 | 5 |
| 20 | 46 | 3 | 61 | 17 | 47 | 2 | 64 |

2/ 5/ 3/ 1/ 4/ 6/1201#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 18 | 48 | 4 | 62 | 19 | 45 |
| 56 | 10 | 39 | 25 | 53 | 11 | 38 | 28 |
| 41 | 23 | 58 | 8 | 44 | 22 | 59 | 5 |
| 32 | 34 | 15 | 49 | 29 | 35 | 14 | 52 |
| 13 | 51 | 30 | 36 | 16 | 50 | 31 | 33 |
| 60 | 6 | 43 | 21 | 57 | 7 | 42 | 24 |
| 37 | 27 | 54 | 12 | 40 | 26 | 55 | 9 |
| 20 | 46 | 3 | 61 | 17 | 47 | 2 | 64 |

2/ 5/ 4/ 1/ 3/ 6/1249#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 18 | 48 | 10 | 56 | 25 | 39 |
| 62 | 4 | 45 | 19 | 53 | 11 | 38 | 28 |
| 35 | 29 | 52 | 14 | 44 | 22 | 59 | 5 |
| 32 | 34 | 15 | 49 | 23 | 41 | 8 | 58 |
| 7 | 57 | 24 | 42 | 16 | 50 | 31 | 33 |
| 60 | 6 | 43 | 21 | 51 | 13 | 36 | 30 |
| 37 | 27 | 54 | 12 | 46 | 20 | 61 | 3 |
| 26 | 40 | 9 | 55 | 17 | 47 | 2 | 64 |

3/ 1/ 2/ 4/ 5/ 6/1441#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 4 | 62 | 6 | 60 | 7 | 57 |
| 32 | 34 | 29 | 35 | 27 | 37 | 26 | 40 |
| 41 | 23 | 44 | 22 | 46 | 20 | 47 | 17 |
| 56 | 10 | 53 | 11 | 51 | 13 | 50 | 16 |
| 49 | 15 | 52 | 14 | 54 | 12 | 55 | 9 |
| 48 | 18 | 45 | 19 | 43 | 21 | 42 | 24 |
| 25 | 39 | 28 | 38 | 30 | 36 | 31 | 33 |
| 8 | 58 | 5 | 59 | 3 | 61 | 2 | 64 |

3/ 1/ 4/ 2/ 5/ 6/1465#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 4 | 62 | 10 | 56 | 11 | 53 |
| 32 | 34 | 29 | 35 | 23 | 41 | 22 | 44 |
| 37 | 27 | 40 | 26 | 46 | 20 | 47 | 17 |
| 60 | 6 | 57 | 7 | 51 | 13 | 50 | 16 |
| 49 | 15 | 52 | 14 | 58 | 8 | 59 | 5 |
| 48 | 18 | 45 | 19 | 39 | 25 | 38 | 28 |
| 21 | 43 | 24 | 42 | 30 | 36 | 31 | 33 |
| 12 | 54 | 9 | 55 | 3 | 61 | 2 | 64 |

3/ 1/ 5/ 2/ 4/ 6/1513#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 10 | 56 | 4 | 62 | 11 | 53 |
| 32 | 34 | 23 | 41 | 29 | 35 | 22 | 44 |
| 37 | 27 | 46 | 20 | 40 | 26 | 47 | 17 |
| 60 | 6 | 51 | 13 | 57 | 7 | 50 | 16 |
| 49 | 15 | 58 | 8 | 52 | 14 | 59 | 5 |
| 48 | 18 | 39 | 25 | 45 | 19 | 38 | 28 |
| 21 | 43 | 30 | 36 | 24 | 42 | 31 | 33 |
| 12 | 54 | 3 | 61 | 9 | 55 | 2 | 64 |

3/ 1/ 6/ 2/ 4/ 5/1561#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 56 | 10 | 63 | 11 | 62 | 4 | 53 |
| 32 | 41 | 23 | 34 | 22 | 35 | 29 | 44 |
| 37 | 20 | 46 | 27 | 47 | 26 | 40 | 17 |
| 60 | 13 | 51 | 6 | 50 | 7 | 57 | 16 |
| 49 | 8 | 58 | 15 | 59 | 14 | 52 | 5 |
| 48 | 25 | 39 | 18 | 38 | 19 | 45 | 28 |
| 21 | 36 | 30 | 43 | 31 | 42 | 24 | 33 |
| 12 | 61 | 3 | 54 | 2 | 55 | 9 | 64 |

3/ 2/ 1/ 4/ 5/ 6/1633#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 4 | 62 | 6 | 60 | 7 | 57 |
| 32 | 34 | 29 | 35 | 27 | 37 | 26 | 40 |
| 49 | 15 | 52 | 14 | 54 | 12 | 55 | 9 |
| 48 | 18 | 45 | 19 | 43 | 21 | 42 | 24 |
| 41 | 23 | 44 | 22 | 46 | 20 | 47 | 17 |
| 56 | 10 | 53 | 11 | 51 | 13 | 50 | 16 |
| 25 | 39 | 28 | 38 | 30 | 36 | 31 | 33 |
| 8 | 58 | 5 | 59 | 3 | 61 | 2 | 64 |

3/ 4/ 1/ 2/ 5/ 6/1825#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 4 | 62 | 18 | 48 | 19 | 45 |
| 32 | 34 | 29 | 35 | 15 | 49 | 14 | 52 |
| 37 | 27 | 40 | 26 | 54 | 12 | 55 | 9 |
| 60 | 6 | 57 | 7 | 43 | 21 | 42 | 24 |
| 41 | 23 | 44 | 22 | 58 | 8 | 59 | 5 |
| 56 | 10 | 53 | 11 | 39 | 25 | 38 | 28 |
| 13 | 51 | 16 | 50 | 30 | 36 | 31 | 33 |
| 20 | 46 | 17 | 47 | 3 | 61 | 2 | 64 |

3/ 5/ 1/ 2/ 4/ 6/2209#

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 63 | 18 | 48 | 4 | 62 | 19 | 45 |
| 32 | 34 | 15 | 49 | 29 | 35 | 14 | 52 |
| 37 | 27 | 54 | 12 | 40 | 26 | 55 | 9 |
| 60 | 6 | 43 | 21 | 57 | 7 | 42 | 24 |
| 41 | 23 | 58 | 8 | 44 | 22 | 59 | 5 |
| 56 | 10 | 39 | 25 | 53 | 11 | 38 | 28 |
| 13 | 51 | 30 | 36 | 16 | 50 | 31 | 33 |
| 20 | 46 | 3 | 61 | 17 | 47 | 2 | 64 |

```
 3/ 6/ 1/ 2/ 4/ 5/2593#    4/ 1/ 2/ 3/ 5/ 6/3361#    4/ 2/ 1/ 3/ 5/ 6/3553#
 1 48 18 63 19 62  4 45    1 63  4 62 34 32 35 29    1 63  4 62 34 32 35 29
32 49 15 34 14 35 29 52   60  6 57  7 27 37 26 40   60  6 57  7 27 37 26 40
37 12 54 27 55 26 40  9   13 51 16 50 46 20 47 17   21 43 24 42 54 12 55  9
60 21 43  6 42  7 57 24   56 10 53 11 23 41 22 44   48 18 45 19 15 49 14 52
41  8 58 23 59 22 44  5   21 43 24 42 54 12 55  9   13 51 16 50 46 20 47 17
56 25 39 10 38 11 53 28   48 18 45 19 15 49 14 52   56 10 53 11 23 41 22 44
13 36 30 51 31 50 16 33   25 39 28 38 58  8 59  5   25 39 28 38 58  8 59  5
20 61  3 46  2 47 17 64   36 30 33 31  3 61  2 64   36 30 33 31  3 61  2 64

 4/ 3/ 1/ 2/ 5/ 6/3745#    4/ 5/ 1/ 2/ 3/ 6/4129#    5/ 1/ 2/ 3/ 4/ 6/4561#
 1 63  4 62 34 32 35 29    1 63 18 48 34 32 49 15    1 63 34 32  4 62 35 29
48 18 45 19 15 49 14 52   62  4 45 19 29 35 14 52   60  6 27 37 57  7 26 40
21 43 24 42 54 12 55  9    7 57 24 42 40 26 55  9   13 51 46 20 16 50 47 17
60  6 57  7 27 37 26 40   60  6 43 21 27 37 12 54   56 10 23 41 53 11 22 44
25 39 28 38 58  8 59  5   11 53 28 38 44 22 59  5   21 43 54 12 24 42 55  9
56 10 53 11 23 41 22 44   56 10 39 25 23 41  8 58   48 18 15 49 45 19 14 52
13 51 16 50 46 20 47 17   13 51 30 36 46 20 61  3   25 39 58  8 28 38 59  5
36 30 33 31  3 61  2 64   50 16 33 31 17 47  2 64   36 30  3 61 33 31  2 64

 5/ 2/ 1/ 3/ 4/ 6/4753#    5/ 3/ 1/ 2/ 4/ 6/4945#    5/ 4/ 1/ 2/ 3/ 6/5329#
 1 63 34 32  4 62 35 29    1 63 34 32  4 62 35 29    1 63 34 32 18 48 49 15
60  6 27 37 57  7 26 40   48 18 15 49 45 19 14 52   62  4 29 35 45 19 14 52
21 43 54 12 24 42 55  9   21 43 54 12 24 42 55  9    7 57 40 26 24 42 55  9
48 18 15 49 45 19 14 52   60  6 27 37 57  7 26 40   60  6 27 37 43 21 12 54
13 51 46 20 16 50 47 17   25 39 58  8 28 38 59  5   11 53 44 22 28 38 59  5
56 10 23 41 53 11 22 44   56 10 23 41 53 11 22 44   56 10 23 41 39 25  8 58
25 39 58  8 28 38 59  5   13 51 46 20 16 50 47 17   13 51 46 20 30 36 61  3
36 30  3 61 33 31  2 64   36 30  3 61 33 31  2 64   50 16 17 47 33 31  2 64

[Count(n1=1)/Total = 360/5760]  OK!
```

We could get 5760 standard solutions in all for our Three-Type Simultaneous magic squares of order 8, and 360 ones with n1=1.

You might think "so many". No, it isn't. We have got the smallest set of solutions of 'Complete Euler Squares' of order 8, theoretically speaking. It is because the factors of $5760 = {}_6P_6 * 2^6 *(1/8)$ shows us it is really the most rare set of precious jewels.

But we have a certain question left unsolved: Are these solutions all of the three-type simultaneous MS88? Do they exist only in 'Complete Euler Squares'? Don't any solutions of 'Non-Euler' type exist beside those?

We must examine this by composing the same objects in our normal method, just the same way as we would often do before, not by New Euler's Method with binary system.

I like to skip listing both of my program and result here, but I must report I could know that all of our object solutions are really of Complete Euler type, and we could make nothing else like 'Non-Euler' ones.

## 10. Comment

I must confess my prediction was wrong. All 'Composite and Pan-diagonal' magic squares of order 8 are certainly 'Complete Euler Squares' of order 8, while all 'Complete Euler Squares' of order 8 are not always of 'Composite' type in reality.

The concept of 'Complete Euler Squares' is unexpectedly broader and more generous. It has high potentiality to make us build any kind of solutions according to your design of Latin Squares. You might compose almost all types of Magic Squares of order 8 by this method with binary decompositions.

But you should know you can use this method only in the case of order 4, 8, 16, ...
It is because you cannot make any binary decompositions perfectly for order 6, 10, or 12. You cannot fill the highest layer of $2^n$ full with '0' or '1' in those orders.

$32<6^2<64$; $64<10^2<128$; $128<12^2<256$; $128<14^2<256$; ...

The next case you can apply this New Euler's Method to is of order 9. Because you can use the Positional Number System of Base 3, and because $9^2 = 3^4$. You can make 4 layers of decompositions for that.

What do you think about the fact we could build various kinds of 'Complete Euler Squares' of order 8 with binary decompositions? What does it mean?
I should say, it means that all of those objects have the same 'structure' in common, what we call 'Complete Euler Squares.'

**** Diagram for Various Sets of Solutions ****

```
    .---------------------------------.
    |    [Self-Complementary MS88]    |
.---+---------------------------------+-[Pan-diagonal MS88]--.
|   |                                 |                      |
| .-+-[Complete Euler Squares 8x8]----+----------------.     |
| | |                                 |                |     |
| | |                 .---------------+-[Composite---. |     |
| | | [Simultaneous   | [Three-type   |& Pan-diagonal| |     |
| | |   S-C.& P-D.    | Simultaneous  |    MS88]     | |     |
| | |     MS88]       |  MS88] 5760   |              | |     |
| | '-----------------+---------------'              | |     |
| |                   |                              | |     |
| | .-[Complete MS88]-+----------.                   | |     |
| | |                 |[Composite|   [Composite      | |     |
| | |                 |& Complete|  & Pan-diagonal   | |     |
| | |                 |   MS88]  |       MS88]       | |     |
| | |                 |  368640  |    119064960      | |     |
| | |                 '----------+---[119439360]-----' |     |
| | |                            |                     |     |
| '-+-------------------[Complete Euler Squares 8x8]---'     |
|   |                            |                           |
|   '------[Complete MS88]-------'                           |
|                                                            |
'------------------------------------------------------------'
```

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