

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 9: How to Build Various 'Euler Cubes' of Order 4
by Binary Number System and "New Euler's Method"**

0. Let's Build 'Complete Euler Cubes' of Order 4, shall we?

We want to examine and know what a wide range of magic forms we can compose by our "New Euler's Method", don't we? Let's build any Pan-Magic Cubes of order 4 this time by our new Greco-Latinian Method applied even to every pantriagonal of the object by binary number system, shall we?

1. Why do we have to use Binary Number System?

I once tried to make any Pan-Magic Cubes of order 4 by our 'New Euler's Method' using the Positional Number System of Base 4, and I succeeded in composing some layer units for them. But when I tried to combine them and compose object solutions, I knew I could not have got any correct 'Complete Euler Cubes' of order 4.

Only when I did not define them to have all pantriagonals consist of {0, 1, 2 and 3}, I could have got some reasonable solutions. But they were no 'Complete Euler Cubes'.

Whenever I wanted all have {0, 1, 2 and 3}, I could have got no correct answers.

We cannot but compose them by Binary Number System instead.

But what jobs do we have to do to build them only by '0' and '1', then?

2. How to make 'Complete' Magic Cubes of Order 4

Let's compose the object we already know very well for our first experiment, since we want to examine the method itself. Can we really reconstruct any 'Complete' magic cubes of Order 4?

*** Basic Form of Complete MC444 and Complete Conditions for Complementary Pairs ***

1-----17-----33-----49		n1+n43=CC; n2+n44=CC; n3+n41=CC; n4+n42=CC;
2 18 34 50		n5+n47=CC; n6+n48=CC; n7+n45=CC; n8+n46=CC;
5 3 21 19 37 35 53 51		n9+n35=CC; n10+n36=CC; n11+n33=CC; n12+n34=CC;
6 4-----22--20-----38--36-----54--52		n13+n39=CC; n14+n40=CC; n15+n37=CC; n16+n38=CC;
9 7 25 23 41 39 57 55		n17+n59=CC; n18+n60=CC; n19+n57=CC; n20+n58=CC;
10 8 26 24 42 40 58 56		n21+n63=CC; n22+n64=CC; n23+n61=CC; n24+n62=CC;
13--11- -29--27-----45--43-----61 59		n25+n51=CC; n26+n52=CC; n27+n49=CC; n28+n50=CC;
14 12 30 28 46 44 62 60		n29+n55=CC; n30+n56=CC; n31+n53=CC; n32+n54=CC;
15 31 47 63		n33+n11=CC; n34+n12=CC; n35+n9=CC; n36+n10=CC;
16-----32-----48-----64	

*** Basic Equations: ***

n1+n2+n3+n4=C ... d1;		n1+n17+n33+n49=C ... d17;		n1+n5+n9+n13=C ... d33;
n5+n6+n7+n8=C ... d2;		n2+n18+n34+n50=C ... d18;		n2+n6+n10+n14=C ... d34;
n9+n10+n11+n12=C ... d3;		n3+n19+n35+n51=C ... d19;		n3+n7+n11+n15=C ... d35;
n13+n14+n15+n16=C... d4;		n4+n20+n36+n52=C ... d20;		n4+n8+n12+n16=C ... d36;
n17+n18+n19+n20=C... d5;		n5+n21+n37+n53=C ... d21;		n17+n21+n25+n29=C ... d37;
n21+n22+n23+n24=C... d6;		n6+n22+n38+n54=C ... d22;		n18+n22+n26+n30=C ... d38;
n25+n26+n27+n28=C... d7;		n7+n23+n39+n55=C ... d23;		n19+n23+n27+n31=C ... d39;
n29+n30+n31+n32=C... d8;		n8+n24+n40+n56=C ... d24;		n20+n24+n28+n32=C ... d40;
n33+n34+n35+n36=C... d9;		n9+n25+n41+n57=C ... d25;		n33+n37+n41+n45=C ... d41;
n37+n38+n39+n40=C... d10;		n10+n26+n42+n58=C ... d26;		n34+n38+n42+n46=C ... d42;
n41+n42+n43+n44=C... d11;		n11+n27+n43+n59=C ... d27;		n35+n39+n43+n47=C ... d43;
n45+n46+n47+n48=C... d12;		n12+n28+n44+n60=C ... d28;		n36+n40+n44+n48=C ... d44;
n49+n50+n51+n52=C... d13;		n13+n29+n45+n61=C ... d29;		n49+n53+n57+n61=C ... d45;
n53+n54+n55+n56=C... d14;		n14+n30+n46+n62=C ... d30;		n50+n54+n58+n62=C ... d46;
n57+n58+n59+n60=C... d15;		n15+n31+n47+n63=C ... d31;		n51+n55+n59+n63=C ... d47;
n61+n62+n63+n64=C... d16;		n16+n32+n48+n64=C ... d32;		n52+n56+n60+n64=C ... d48;

At first we have to design and compose the layer units by binary numbers.

I prepared a basic form with its position names and wrote some basic simultaneous equations as shown above at the first definition stage.

In every layer unit the magic constant C is always equal to 2 and CC is equal to 1, and therefore each line in three directions must consist of two '0's and two '1's.

'Complete Conditions' above with 32 pairs of complementary numbers of 1 mean their unique locations only on all pantriagonals. Every pantriagonal must be made of those two pairs picked out of the 32 complementary ones above, so that it should add up to the same sum 2, the magic constant. The 'Complete' magic cube is a special type of Pantriagonal ones of order 4, and the solution set of the former is included in the one of the latter as a 'sub-set'.

We always use these conditions with some modification as follows:

$$n43=CC-n1; n44=CC-n2; n41=CC-n3; n42=CC-n4; n47=CC-n5; \dots ;$$

$$n50=CC-n28; n55=CC-n29; n56=CC-n30; n53=CC-n31; n54=CC-n32;$$

We can define those pairs (n1, n43), (n2, n44), (n3, n41), (n4, n42), (n5, n47), , (n31, n53) and (n32, n54) at the same time in each procedure of our program.

(1) I set original flags as many as those basic definitions above to watch how often the value '0' or '1' is taken. If both '0' and '1' are taken twice in any line, the equal sum of it is constantly realized. If not, you must give up your present trial then.

(2) How to combine those layer units and calculate and compose the object solution is just the same as the previous way of composing pan-magic squares of order 8.

Find the best combination of layer units referring to the Table of Matching Digits and calculate each value of variable under the next equation:

$$V_n = A_n \cdot 32 + B_n \cdot 16 + C_n \cdot 8 + D_n \cdot 4 + E_n \cdot 2 + F_n \cdot 1 + 1 \quad (n=1, 2, 3, 4, \dots, 63, 64)$$

(3) Before listing out any composed answer, you must always check if it is not against the definition(3), and must select the correct answers that could pass through the test and the list forming inequality conditions.

The first result came out with the composed layer units as many as 524.

I knew I had to study all $524P_6$ cases to get the correct answers. It was too many to go on. It should take too long a time to count them piece by piece up to the last.

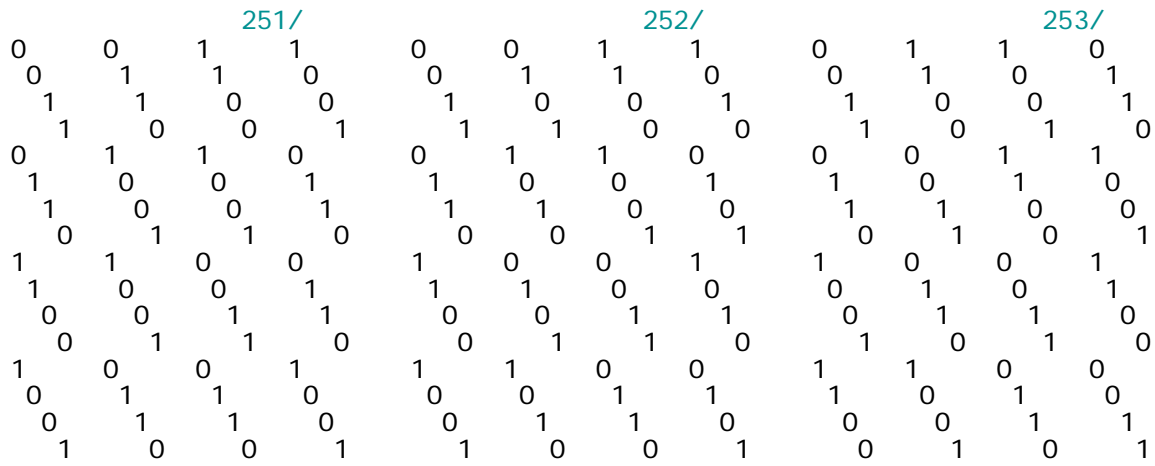
I decided to get only the standard solutions with $n1=1$. We could only compose the layer units with $n1=0$, then. The new count of layer units was 262. I made the reference table of 262×262 , and tried to compose the object solutions.

The next list shows the result of my recent calculation.

[List of Layer Units (Part)]

1/				2/				3/			
0	1	1	0	0	1	1	0	0	1	1	0
1	0	0	1	1	0	0	1	1	0	0	1
0	1	0	1	0	1	0	1	0	1	0	1
1	0	1	0	1	0	1	0	1	0	1	0
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0	1	0	1	0	1	0	1	0	1	0	1
1	0	1	0	1	0	1	0	1	0	1	0
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0	1	0	1	0	1	0	1	0	1	0	1
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1	0	1	0	1	0	1	0	1	0	1	0
0											

<pre> 0 1 0 1 1 0 1 0 0 1 1 0 1 0 0 1 1 0 1 0 1 0 0 1 0 0 1 1 1 0 1 </pre>	<p style="text-align: center; color: cyan;">51/</p> <pre> 0 1 0 1 1 0 1 0 1 0 0 1 1 0 1 0 0 1 0 1 0 1 1 0 1 0 1 0 1 0 0 1 </pre>	<pre> 0 1 0 1 1 0 1 0 0 1 0 1 1 0 1 0 1 0 0 1 1 0 1 0 0 1 0 1 1 0 1 0 </pre>	<p style="text-align: center; color: cyan;">52/</p> <pre> 0 1 0 1 1 0 1 0 0 1 0 1 1 0 1 0 1 0 0 1 1 0 1 0 0 1 0 1 1 0 1 0 </pre>	<pre> 0 1 1 0 1 0 0 1 1 0 1 0 0 1 0 1 1 0 1 0 1 0 0 1 0 1 1 0 1 0 1 0 </pre>	<p style="text-align: center; color: cyan;">53/</p> <pre> 0 1 1 0 1 0 0 1 1 0 1 0 0 1 1 0 0 1 0 1 1 0 1 0 0 1 0 1 1 0 1 0 </pre>
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<pre> 0 1 0 1 0 1 1 0 0 1 1 0 1 0 0 1 1 0 1 1 1 0 1 1 1 0 1 1 1 0 1 1 </pre>	<p style="text-align: center; color: cyan;">151/</p> <pre> 0 1 0 1 0 1 1 0 0 1 1 0 1 0 0 1 1 0 1 1 1 0 1 1 1 0 1 1 1 0 1 1 </pre>	<p style="text-align: center; color: cyan;">152/</p> <pre> 0 1 0 1 0 1 1 0 0 1 1 0 1 0 0 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 </pre>	<p style="text-align: center; color: cyan;">153/</p> <pre> 0 1 1 0 0 1 0 1 0 1 0 1 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 </pre>		
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[Reference Table of Matching Digits]

*	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	..
1	64	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	32	48	32	48	32	48	32	48	32	
2	48	64	56	56	48	56	48	48	40	56	48	48	40	48	40	40	32	48	32	48	40	40	40	40	40	48	32
3	48	56	64	48	56	48	56	40	48	48	56	40	48	40	48	32	40	48	36	44	36	44	44	36	44	36	
4	48	56	48	64	56	48	40	56	48	48	40	56	48	40	32	48	40	48	36	44	44	36	36	44	44	36	
5	48	48	56	56	64	40	48	48	56	40	48	48	56	32	40	40	48	48	40	40	40	40	40	40	40	40	
6	48	56	48	48	40	64	56	56	48	48	40	40	32	56	48	48	40	48	36	44	36	44	44	36	44	36	
7	48	48	56	40	48	56	64	48	56	40	48	32	40	48	56	40	48	48	40	40	32	48	48	32	40	40	
8	48	48	40	56	48	56	48	64	56	40	32	48	40	48	40	56	48	48	40	40	40	40	40	40	40	40	
9	48	40	48	48	56	48	56	56	64	32	40	40	48	40	48	48	56	48	44	36	36	44	44	36	36	44	
10	48	56	48	48	40	48	40	40	32	64	56	56	48	56	48	48	40	48	36	44	44	36	36	44	44	36	
11	48	48	56	40	48	40	48	32	40	56	64	48	56	48	56	40	48	48	40	40	40	40	40	40	40	40	
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13	48	40	48	48	56	32	40	40	48	48	56	56	64	40	48	48	56	48	44	36	44	36	36	44	36	44	
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19	48	32	36	36	40	36	40	40	40	44	36	40	40	44	44	48	32	64	48	48	40	48	40	48	32	32	
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21	48	40	36	44	40	36	32	40	36	44	40	48	44	40	36	44	40	32	48	40	64	48	32	32	48	40	
22	32	40	44	36	40	44	48	40	44	36	40	32	36	40	44	36	40	48	40	48	48	64	32	32	40	48	
23	48	40	44	36	40	44	48	40	44	36	40	32	36	40	44	36	40	32	48	40	32	32	64	48	48	40	
24	32	40	36	44	40	36	32	40	36	44	40	48	44	40	36	44	40	48	40	48	32	32	48	64	40	48	
25	48	48	44	44	40	44	40	40	36	44	40	40	36	40	36	36	32	32	32	32	48	40	48	40	64	48	
26	32	32	36	36	40	36	40	40	44	36	40	40	44	40	44	44	48	48	32	32	40	48	40	48	48	64	

[Count of Layer Units = 262]

** Compositions of Euler Type of Complete MC444: (Part) **

1/ 18/ 27/ 52/ 61/192/	1#	1/ 18/ 27/ 61/ 52/192/	1123#
1-----48-----49-----32		1-----48-----49-----32	
63 18 15 34		63 18 15 34	
60 4 21 45 12 52 37 29		62 6 19 43 14 54 35 27	
6 62-----43--19-----54--14-----27--35		4 60-----45--21-----52--12-----29--37	
13 57 36 24 61 9 20 40		11 57 38 24 59 9 22 40	
51 7 30 42 3 55 46 26		53 7 28 42 5 55 44 26	
56--16- --25--33-----8--64-----41 17		56--16- --25--33-----8--64-----41 17	
10 50 39 31 58 2 23 47		10 50 39 31 58 2 23 47	
53 28 5 44		51 30 3 46	
11-----38-----59-----22		13-----36-----61-----20	

1/ 18/ 27/ 62/ 52/191/ 1301#
1-----48-----49-----32
|63 18 12 |37
62 6 19 43 14 54 35 27
| 4 60----45--21----55--15----26--34
11 57 | 38 24 59 9 22 40 |
|50 7 31 42 5 52 |44 29
56--16-|--25--33----8--64----41 17 |
13 53 36 28 58 2 23 47
51 | 30 3 46 |
10-----39-----61-----20

1/ 18/ 27/ 63/ 52/190/ 1353#
1-----48-----49-----32
|63 18 12 |37
62 6 19 43 14 54 35 27
| 4 60----42--21----55--15----29--34
11 57 | 38 24 59 9 22 40 |
|50 7 31 45 5 52 |44 26
56--16-|--25--33----8--64----41 17 |
13 53 39 28 58 2 20 47
51 | 30 3 46 |
10-----36-----61-----23

1/ 18/ 27/ 64/ 52/189/ 1389#
1-----48-----49-----32
|63 21 12 |34
62 6 19 43 14 54 35 27
| 4 60----45--18----55--15----26--37
11 57 | 38 24 59 9 22 40 |
|50 7 28 42 5 52 |47 29
56--16-|--25--33----8--64----41 17 |
13 53 36 31 58 2 23 44
51 | 30 3 46 |
10-----39-----61-----20

1/ 18/ 27/ 65/ 52/188/ 1425#
1-----48-----49-----32
|63 21 12 |34
62 6 19 43 14 54 35 27
| 4 60----42--18----55--15----29--37
11 57 | 38 24 59 9 22 40 |
|50 7 28 45 5 52 |47 26
56--16-|--25--33----8--64----41 17 |
13 53 39 31 58 2 20 44
51 | 30 3 46 |
10-----36-----61-----23

1/ 18/ 27/ 66/ 52/191/ 1477#
1-----48-----53-----28
|63 18 16 |33
62 6 19 43 10 50 39 31
| 4 60----45--21----51--11----30--38
15 57 | 34 24 59 13 22 36 |
|54 7 27 42 5 56 |44 25
52--12-|--29--37----8--64----41 17 |
9 49 40 32 58 2 23 47
55 | 26 3 46 |
14-----35-----61-----20

1/ 18/ 27/ 67/ 52/190/ 1529#
1-----48-----53-----28
|63 18 16 |33
62 6 23 43 10 50 35 31
| 4 60----46--21----51--11----29--38
15 57 | 34 20 59 13 22 40 |
|54 7 27 41 5 56 |44 26
52--12-|--25--37----8--64----45 17 |
9 49 39 32 58 2 24 47
55 | 30 3 42 |
14-----36-----61-----19

1/ 18/ 27/ 68/ 52/189/ 1565#
1-----44-----53-----32
|63 17 16 |34
62 6 19 47 10 50 39 27
| 4 60----45--22----51--11----30--37
15 57 | 38 24 59 13 18 36 |
|54 7 28 42 5 56 |43 25
52--12-|--29--33----8--64----41 21 |
9 49 40 31 58 2 23 48
55 | 26 3 46 |
14-----35-----61-----20

1/ 18/ 27/ 69/ 52/188/ 1601#
1-----44-----53-----32
|63 17 16 |34
62 6 23 47 10 50 35 27
| 4 60----46--22----51--11----29--37
15 57 | 38 20 59 13 18 40 |
|54 7 28 41 5 56 |43 26
52--12-|--25--33----8--64----45 21 |
9 49 39 31 58 2 24 48
55 | 30 3 42 |
14-----36-----61-----19

1/ 18/ 27/256/ 52/ 93/ 25267#
1-----44-----53-----32
|60 22 11 |37
58 6 23 47 14 50 35 27
| 8 63----41--17----55--16----26--34
15 61 | 38 20 59 9 18 40 |
|49 3 31 46 2 52 |48 29
56--12-|--25--33----4--64----45 21 |
13 54 36 28 62 5 19 43
51 | 30 7 42 |
10-----39-----57-----24

1/ 18/ 30/ 51/ 55/192/ 25303#
1-----48-----51-----30
|63 18 13 |36
60 4 21 45 8 50 41 31
| 6 62----43--19----58--16----23--33
15 55 | 34 26 61 11 20 38 |
|49 9 32 40 3 53 |46 28
54--14-|--27--35----10--64----39 17 |
12 52 37 29 56 2 25 47
57 | 24 5 44 |
7-----42-----59-----22

1/ 18/ 31/ 50/ 55/198/ 27511#
 1-----48-----52-----29
 |63 18 14 |35
 60 4 21 45 7 49 42 32
 | 6 62---40--19---57--15---27--34
 16 55 | 33 26 61 12 20 37 |
 |50 9 31 43 3 54 |46 24
 53--13-|--28--36---10--64---39 17 |
 11 51 41 30 56 2 22 47
 58 | 23 5 44 |
 8-----38-----59-----25

1/ 18/ 32/ 49/ 55/198/ 29635#
 1-----48-----52-----29
 |63 18 14 |35
 60 4 25 45 7 49 38 32
 | 6 62---44--19---57--15---23--34
 16 55 | 33 22 61 12 20 41 |
 |50 9 31 39 3 54 |46 28
 53--13-|--24--36---10--64---43 17 |
 11 51 37 30 56 2 26 47
 58 | 27 5 40 |
 8-----42-----59-----21

1/ 18/ 33/ 48/ 55/192/ 31759#
 1-----48-----51-----30
 |63 18 13 |36
 60 4 25 45 8 50 37 31
 | 6 62---39--19---58--16---27--33
 15 55 | 34 22 61 11 20 42 |
 |49 9 32 44 3 53 |46 24
 54--14-|--23--35---10--64---43 17 |
 12 52 41 29 56 2 21 47
 57 | 28 5 40 |
 7-----38-----59-----26

1/ 18/ 36/ 45/ 55/174/ 33967#
 1-----48-----52-----29
 |63 18 14 |35
 60 4 21 45 7 49 42 32
 | 9 62---43--19---54--15---24--34
 16 55 | 33 26 61 12 20 37 |
 |50 6 31 40 3 57 |46 27
 53--13-|--28--36---10--64---39 17 |
 8 51 38 30 59 2 25 47
 58 | 23 5 44 |
 11-----41-----56-----22

1/ 18/ 37/ 44/ 55/173/ 36091#
 1-----48-----52-----29
 |63 18 14 |35
 60 4 21 45 7 49 42 32
 | 9 62---40--19---54--15---27--34
 16 55 | 33 26 61 12 20 37 |
 |50 6 31 43 3 57 |46 24
 53--13-|--28--36---10--64---39 17 |
 8 51 41 30 59 2 22 47
 58 | 23 5 44 |
 11-----38-----56-----25

1/ 18/ 38/ 43/ 55/173/ 38299#
 1-----48-----52-----29
 |63 18 14 |35
 60 4 25 45 7 49 38 32
 | 9 62---44--19---54--15---23--34
 16 55 | 33 22 61 12 20 41 |
 |50 6 31 39 3 57 |46 28
 53--13-|--24--36---10--64---43 17 |
 8 51 37 30 59 2 26 47
 58 | 27 5 40 |
 11-----42-----56-----21

1/ 18/260/ 30/ 51/100/ 282255#
 1-----40-----58-----31
 |56 26 15 |33
 54 10 27 47 3 49 46 24
 |12 63---37--17---61-- 8---20--42
 16 51 | 41 30 55 6 18 43 |
 |57 13 23 36 2 60 |48 21
 59-- 7-|--22--34---14--64---35 25 |
 5 50 44 32 52 9 29 39
 62 | 19 11 38 |
 4-----45-----53-----28

1/ 20/ 26/ 52/ 60/192/ 283405#
 1-----54-----43-----32
 |63 12 21 |34
 60 4 15 45 18 52 37 29
 | 6 62---49--19---48--14---27--35
 13 57 | 36 24 61 9 20 40 |
 |51 7 30 42 3 55 |46 26
 56--22-|--25--33--- 8--64---41 11 |
 10 44 39 31 58 2 23 53
 47 | 28 5 50 |
 17-----38-----59-----16

1/ 20/ 33/ 47/ 58/192/ 286381#
 1-----58-----39-----32
 |63 8 25 |34
 60 4 13 47 20 50 37 29
 | 6 62---51--17---46--16---27--35
 15 55 | 36 22 61 11 18 42 |
 |49 9 30 44 3 53 |48 24
 54--26-|--23--33---10--64---43 7 |
 12 40 41 31 56 2 21 57
 45 | 28 5 52 |
 19-----38-----59-----14

1/ 20/ 47/ 33/ 58/192/ 286849#
 1-----54-----43-----32
 |63 12 21 |34
 56 4 13 47 20 50 41 29
 |10 62---51--17---46--16---23--35
 15 59 | 36 26 61 7 18 38 |
 |49 5 30 40 3 57 |48 28
 58--22-|--27--33--- 6--64---39 11 |
 8 44 37 31 60 2 25 53
 45 | 24 9 52 |
 19-----42-----55-----14

1/ 20/249/ 26/ 52/ 99/ 296722#
1-----52-----46-----31
|56 14 27 |33
54 10 7 47 25 49 44 24
|12 63-----50--17-----39-- 8-----29--42
16 61 | 41 28 55 6 18 35 |
|57 3 23 45 2 60 |48 22
59--19-|--30--34-----4--64-----37 13 |
5 38 43 32 62 9 20 51
40 | 21 11 58 |
26-----36-----53-----15

1/ 20/250/ 26/ 52/ 99/ 296869#
1-----52-----46-----31
|56 14 27 |33
54 10 15 47 25 49 36 24
|12 63-----58--17-----39-- 8-----21--42
16 61 | 41 20 55 6 18 43 |
|57 3 23 37 2 60 |48 30
59--19-|--22--34-----4--64-----45 13 |
5 38 35 32 62 9 28 51
40 | 29 11 50 |
26-----44-----53-----7

1/ 22/ 24/ 52/ 60/188/ 297037#
1-----54-----43-----32
|63 19 14 |34
60 4 15 45 18 52 37 29
| 6 62-----42--12-----55--21-----27--35
13 57 | 36 24 61 9 20 40 |
|44 7 30 49 3 48 |53 26
56--22-|--25--33-----8--64-----41 11 |
17 51 39 31 58 2 16 46
47 | 28 5 50 |
10-----38-----59-----23

1/ 24/ 22/ 52/ 60/188/ 313017#
1-----46-----51-----32
|63 11 22 |34
60 4 23 53 10 44 37 29
| 6 62-----50--20-----47--13-----27--35
21 57 | 36 16 61 17 12 40 |
|52 7 30 41 3 56 |45 26
48--14-|--25--33-----8--64-----49 19 |
9 43 39 31 58 2 24 54
55 | 28 5 42 |
18-----38-----59-----15

1/ 26/ 20/ 52/ 60/192/ 340281#
1-----46-----51-----32
|63 20 13 |34
60 4 23 53 10 44 37 29
| 6 62-----41--11-----56--22-----27--35
21 57 | 36 16 61 17 12 40 |
|43 7 30 50 3 47 |54 26
48--14-|--25--33-----8--64-----49 19 |
18 52 39 31 58 2 15 45
55 | 28 5 42 |
9-----38-----59-----24

1/ 27/ 18/ 52/ 61/192/ 367545#
1-----56-----41-----32
|63 10 23 |34
60 4 13 53 20 44 37 29
| 6 62-----51--11-----46--22-----27--35
21 57 | 36 16 61 17 12 40 |
|43 7 30 50 3 47 |54 26
48--24-|--25--33-----8--64-----49 9 |
18 42 39 31 58 2 15 55
45 | 28 5 52 |
19-----38-----59-----14

1/ 29/ 26/ 48/ 54/192/ 1360209#
1-----54-----43-----32
|63 12 21 |34
60 4 25 45 8 52 37 29
| 6 62-----39--19-----58--14-----27--35
13 47 | 36 24 61 9 20 50 |
|51 17 30 42 3 55 |46 16
56--22-|--15--33-----18--64-----41 11 |
10 44 49 31 48 2 23 53
57 | 28 5 40 |
7-----38-----59-----26

1/ 30/ 18/ 51/ 55/192/ 1371493#
1-----56-----43-----30
|63 10 21 |36
60 4 13 53 8 42 49 31
| 6 62-----51--11-----58--24-----15--33
23 47 | 34 26 61 19 12 38 |
|41 17 32 40 3 45 |54 28
46--22-|--27--35-----18--64-----39 9 |
20 44 37 29 48 2 25 55
57 | 16 5 52 |
7-----50-----59-----14

1/259/ 18/ 30/ 51/ 96/ 14679389#
1-----40-----58-----31
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46 18 27 55 3 41 54 16
|20 63-----37--26-----61-- 8-----12--33
24 43 | 49 30 47 6 10 51 |
|57 21 32 36 2 60 |39 13
59-- 7-|--14--34-----22--64-----35 25 |
5 42 52 15 44 17 29 56
62 | 11 19 38 |
4-----53-----45-----28

1/260/ 18/ 30/ 51/100/ 14742997#
1-----40-----58-----31
|48 26 23 |33
46 18 27 55 3 41 54 16
|20 63-----37-- 9-----61-- 8-----12--50
24 43 | 49 30 47 6 10 51 |
|57 21 15 36 2 60 |56 13
59-- 7-|--14--34-----22--64-----35 25 |
5 42 52 32 44 17 29 39
62 | 11 19 38 |
4-----53-----45-----28

1/261/ 22/ 38/ 41/ 61/ 14798749#
1-----62-----35-----32
|48 9 24 |49
46 18 7 55 26 42 51 15
|21 63---38-- 4---59--29---12--34
23 43 | 50 28 47 5 10 54 |
|36 20 31 57 2 40 |61 13
60--30-|--11--33---22--64---37 3 |
25 41 52 16 45 17 8 56
39 | 14 19 58 |
6-----53-----44-----27

2/ 17/ 27/ 52/ 61/192/ 14812381#
1-----48-----49-----32
|63 18 15 |34
60 4 21 29 12 52 37 45
| 6 62---43--35---54--14---27--19
13 57 | 20 40 61 9 36 24 |
|51 7 46 26 3 55 |30 42
56--16-|--41--33---8--64---25 17 |
10 50 23 31 58 2 39 47
53 | 28 5 44 |
11-----38-----59-----22

2/ 19/ 26/ 52/ 60/192/ 14901385#
1-----54-----43-----32
|63 12 21 |34
60 4 15 29 18 52 37 45
| 6 62---49--35---48--14---27--19
13 57 | 20 40 61 9 36 24 |
|51 7 46 26 3 55 |30 42
56--22-|--41--33---8--64---25 11 |
10 44 23 31 58 2 39 53
47 | 28 5 50 |
17-----38-----59-----16

2/ 26/ 19/ 52/ 60/192/ 14907457#
1-----46-----51-----32
|63 20 13 |34
60 4 23 29 10 44 37 53
| 6 62---41--35---56--22---27--11
21 57 | 12 40 61 17 36 16 |
|43 7 54 26 3 47 |30 50
48--14-|--49--33---8--64---25 19 |
18 52 15 31 58 2 39 45
55 | 28 5 42 |
9-----38-----59-----24

2/258/ 17/ 31/ 50/ 94/ 16008073#
1-----56-----58-----15
|48 25 23 |34
46 18 27 16 3 41 54 55
|20 63---36--33---61-- 8---13--26
24 43 | 10 53 47 6 49 28 |
|57 21 39 14 2 60 |32 35
59-- 7-|--37--50---22--64---12 9 |
5 42 30 31 44 17 51 40
62 | 11 19 38 |
4-----52-----45-----29

2/259/ 17/ 31/ 50/ 94/ 16013765#
1-----40-----58-----31
|48 9 23 |50
46 18 27 32 3 41 54 39
|20 63---36--49---61-- 8---13--10
24 43 | 26 53 47 6 33 28 |
|57 21 55 14 2 60 |16 35
59-- 7-|--37--34---22--64---12 25 |
5 42 30 15 44 17 51 56
62 | 11 19 38 |
4-----52-----45-----29

3/ 16/ 27/ 52/ 61/192/ 16019461#
1-----48-----49-----32
|63 18 15 |34
60 4 21 29 12 52 37 45
| 6 62---27--35---54--14---43--19
13 57 | 20 40 61 9 36 24 |
|51 7 46 42 3 55 |30 26
56--16-|--41--33---8--64---25 17 |
10 50 39 31 58 2 23 47
53 | 28 5 44 |
11-----22-----59-----38

4/ 15/ 27/ 52/ 61/192/ 17137021#
1-----48-----49-----32
|63 18 15 |34
60 4 37 29 12 52 21 45
| 6 62---43--35---54--14---27--19
13 57 | 20 24 61 9 36 40 |
|51 7 46 26 3 55 |30 42
56--16-|--25--33---8--64---41 17 |
10 50 23 31 58 2 39 47
53 | 44 5 28 |
11-----38-----59-----22

5/ 14/ 27/ 52/ 61/192/ 18245121#
1-----48-----49-----32
|63 18 15 |34
60 4 37 29 12 52 21 45
| 6 62---27--35---54--14---43--19
13 57 | 20 24 61 9 36 40 |
|51 7 46 42 3 55 |30 26
56--16-|--25--33---8--64---41 17 |
10 50 39 31 58 2 23 47
53 | 44 5 28 |
11-----22-----59-----38

6/ 13/ 27/ 52/ 61/192/ 19425537#
1-----48-----49-----32
|63 34 15 |18
60 4 21 29 12 52 37 45
| 6 62---43--19---54--14---27--35
13 57 | 20 40 61 9 36 24 |
|51 7 30 26 3 55 |46 42
56--16-|--41--33---8--64---25 17 |
10 50 23 47 58 2 39 31
53 | 28 5 44 |
11-----38-----59-----22

7/ 12/ 27/ 52/ 61/192/ 20552557#
1-----48-----49-----32
|63 34 15 |18
60 4 21 29 12 52 37 45
| 6 62-----27--19-----54--14-----43--35
13 57 | 20 40 61 9 36 24 |
|51 7 30 42 3 55 |46 26
56--16-|--41--33-----8--64-----25 17 |
10 50 39 47 58 2 23 31
53 | 28 5 44 |
11-----22-----59-----38

8/ 11/ 27/ 52/ 61/192/ 21786301#
1-----48-----49-----32
|63 34 15 |18
60 4 37 29 12 52 21 45
| 6 62-----43--19-----54--14-----27--35
13 57 | 20 24 61 9 36 40 |
|51 7 30 26 3 55 |46 42
56--16-|--25--33-----8--64-----41 17 |
10 50 23 47 58 2 39 31
53 | 44 5 28 |
11-----38-----59-----22

9/ 10/ 27/ 52/ 61/192/ 22993381#
1-----48-----49-----32
|63 34 15 |18
60 4 37 29 12 52 21 45
| 6 62-----27--19-----54--14-----43--35
13 57 | 20 24 61 9 36 40 |
|51 7 30 42 3 55 |46 26
56--16-|--25--33-----8--64-----41 17 |
10 50 39 47 58 2 23 31
53 | 44 5 28 |
11-----22-----59-----38

10/ 9/ 27/ 52/ 61/192/ 24110941#
1-----32-----49-----48
|63 18 15 |34
60 4 21 45 12 52 37 29
| 6 62-----43--35-----54--14-----27--19
13 57 | 36 40 61 9 20 24 |
|51 7 46 26 3 55 |30 42
56--16-|--41--17-----8--64-----25 33 |
10 50 23 31 58 2 39 47
53 | 28 5 44 |
11-----38-----59-----22

11/ 8/ 27/ 52/ 61/192/ 24518345#
1-----32-----49-----48
|63 18 15 |34
60 4 21 45 12 52 37 29
| 6 62-----27--35-----54--14-----43--19
13 57 | 36 40 61 9 20 24 |
|51 7 46 42 3 55 |30 26
56--16-|--41--17-----8--64-----25 33 |
10 50 39 31 58 2 23 47
53 | 28 5 44 |
11-----22-----59-----38

12/ 7/ 27/ 52/ 61/192/ 24965507#
1-----32-----49-----48
|63 18 15 |34
60 4 37 45 12 52 21 29
| 6 62-----43--35-----54--14-----27--19
13 57 | 36 24 61 9 20 40 |
|51 7 46 26 3 55 |30 42
56--16-|--25--17-----8--64-----41 33 |
10 50 23 31 58 2 39 47
53 | 44 5 28 |
11-----38-----59-----22

13/ 6/ 27/ 52/ 61/192/ 25407554#
1-----32-----49-----48
|63 18 15 |34
60 4 37 45 12 52 21 29
| 6 62-----27--35-----54--14-----43--19
13 57 | 36 24 61 9 20 40 |
|51 7 46 42 3 55 |30 26
56--16-|--25--17-----8--64-----41 33 |
10 50 39 31 58 2 23 47
53 | 44 5 28 |
11-----22-----59-----38

14/ 5/ 27/ 52/ 61/192/ 25815024#
1-----32-----49-----48
|63 34 15 |18
60 4 21 45 12 52 37 29
| 6 62-----43--19-----54--14-----27--35
13 57 | 36 40 61 9 20 24 |
|51 7 30 26 3 55 |46 42
56--16-|--41--17-----8--64-----25 33 |
10 50 23 47 58 2 39 31
53 | 28 5 44 |
11-----38-----59-----22

15/ 4/ 27/ 52/ 61/192/ 26241861#
1-----32-----49-----48
|63 34 15 |18
60 4 21 45 12 52 37 29
| 6 62-----27--19-----54--14-----43--35
13 57 | 36 40 61 9 20 24 |
|51 7 30 42 3 55 |46 26
56--16-|--41--17-----8--64-----25 33 |
10 50 39 47 58 2 23 31
53 | 28 5 44 |
11-----22-----59-----38

16/ 3/ 27/ 52/ 61/192/ 26642516#
1-----32-----49-----48
|63 34 15 |18
60 4 37 45 12 52 21 29
| 6 62-----43--19-----54--14-----27--35
13 57 | 36 24 61 9 20 40 |
|51 7 30 26 3 55 |46 42
56--16-|--25--17-----8--64-----41 33 |
10 50 23 47 58 2 39 31
53 | 44 5 28 |
11-----38-----59-----22

17/ 2/ 27/ 52/ 61/192/ 27043063#
 1-----32-----49-----48
 |63 34 15 |18
 60 4 37 45 12 52 21 29
 | 6 62-----27--19-----54--14-----43--35
 13 57 | 36 24 61 9 20 40 |
 |51 7 30 42 3 55 |46 26
 56--16-|--25--17-----8--64-----41 33 |
 10 50 39 47 58 2 23 31
 53 | 44 5 28 |
 11-----22-----59-----38

18/ 1/ 27/ 52/ 61/192/ 27470865#
 1-----32-----49-----48
 |63 34 15 |18
 60 4 37 29 12 52 21 45
 | 6 62-----27--35-----54--14-----43--19
 13 57 | 20 40 61 9 36 24 |
 |51 7 46 26 3 55 |30 42
 56--16-|--41--17-----8--64-----25 33 |
 10 50 23 47 58 2 39 31
 53 | 44 5 28 |
 11-----22-----59-----38

19/ 2/ 26/ 52/ 60/192/ 31876270#
 1-----54-----27-----48
 |63 12 37 |18
 60 4 15 45 34 52 21 29
 | 6 62-----49--19-----32--14-----43--35
 13 57 | 36 24 61 9 20 40 |
 |51 7 30 42 3 55 |46 26
 56--38-|--25--17-----8--64-----41 11 |
 10 28 39 47 58 2 23 53
 31 | 44 5 50 |
 33-----22-----59-----16

20/ 1/ 26/ 52/ 60/192/ 32036950#
 1-----54-----27-----48
 |63 12 37 |18
 60 4 15 29 34 52 21 45
 | 6 62-----49--35-----32--14-----43--19
 13 57 | 20 40 61 9 36 24 |
 |51 7 46 26 3 55 |30 42
 56--38-|--41--17-----8--64-----25 11 |
 10 28 23 47 58 2 39 53
 31 | 44 5 50 |
 33-----22-----59-----16

21/ 7/ 24/ 52/ 61/187/ 32140624#
 1-----55-----26-----48
 |63 18 15 |34
 60 4 14 45 35 52 21 29
 | 6 62-----43--12-----54--37-----27--19
 13 57 | 36 24 61 9 20 40 |
 |28 7 46 49 3 32 |53 42
 56--39-|--25--17-----8--64-----41 10 |
 33 50 23 31 58 2 16 47
 30 | 44 5 51 |
 11-----38-----59-----22

22/ 1/ 24/ 52/ 60/188/ 32358058#
 1-----54-----27-----48
 |63 35 14 |18
 60 4 15 29 34 52 21 45
 | 6 62-----26--12-----55--37-----43--19
 13 57 | 20 40 61 9 36 24 |
 |28 7 46 49 3 32 |53 42
 56--38-|--41--17-----8--64-----25 11 |
 33 51 23 47 58 2 16 30
 31 | 44 5 50 |
 10-----22-----59-----39

23/ 12/ 22/ 52/ 61/186/ 32510428#
 1-----48-----50-----31
 |63 10 39 |18
 60 4 21 53 11 28 38 45
 | 6 62-----51--19-----30--13-----43--36
 37 57 | 20 16 61 33 12 24 |
 |52 7 29 42 3 56 |46 25
 32--15-|--41--34-----8--64-----49 17 |
 9 26 40 47 58 2 23 55
 54 | 27 5 44 |
 35-----22-----59-----14

25/ 17/ 20/ 52/ 59/192/ 32992468#
 1-----48-----51-----30
 |63 18 13 |36
 60 4 21 53 10 28 39 45
 | 6 62-----43--11-----56--38-----25--19
 37 57 | 20 16 61 33 12 24 |
 |27 7 46 50 3 31 |54 42
 32--14-|--41--35-----8--64-----49 17 |
 34 52 23 29 58 2 15 47
 55 | 26 5 44 |
 9-----40-----59-----22

28/ 5/ 27/ 47/ 54/192/ 33474508#
 1-----58-----23-----48
 |63 8 41 |18
 60 4 21 45 12 52 37 29
 | 6 62-----43--19-----54--14-----27--35
 13 31 | 36 40 61 9 20 50 |
 |51 33 30 26 3 55 |46 16
 56--42-|--15--17-----34--64-----25 7 |
 10 24 49 47 32 2 39 57
 53 | 28 5 44 |
 11-----38-----59-----22

29/ 1/ 26/ 48/ 54/192/ 33635440#
 1-----54-----27-----48
 |63 12 37 |18
 60 4 41 29 8 52 21 45
 | 6 62-----23--35-----58--14-----43--19
 13 31 | 20 40 61 9 36 50 |
 |51 33 46 26 3 55 |30 16
 56--38-|--15--17-----34--64-----25 11 |
 10 28 49 47 32 2 39 53
 57 | 44 5 24 |
 7-----22-----59-----42

98/ 1/ 18/ 27/ 52/174/ 51336364#
 1-----56-----58-----15
 |63 10 8 |49
 62 34 43 23 5 25 20 48
 |35 32----21--41----28--39----46--18
 40 29 | 17 12 31 38 42 51 |
 |26 4 47 54 33 59 |24 13
 27-- 7-|--14--50----36--64----53 9 |
 6 57 52 16 61 2 11 55
 60 | 45 3 22 |
 37-----19-----30-----44

99/ 1/ 18/ 27/ 52/170/ 51772216#
 1-----56-----58-----15
 |63 41 8 |18
 62 34 11 23 5 25 52 48
 |35 32----53--10----28--39----14--49
 40 29 | 17 44 31 38 42 19 |
 |26 4 16 22 33 59 |55 45
 27-- 7-|--46--50----36--64----21 9 |
 6 57 20 47 61 2 43 24
 60 | 13 3 54 |
 37-----51-----30-----12

100/ 1/ 18/ 27/ 52/169/ 52267640#
 1-----56-----58-----15
 |63 41 8 |18
 62 34 11 23 5 25 52 48
 |35 32----22--10----28--39----45--49
 40 29 | 17 44 31 38 42 19 |
 |26 4 16 53 33 59 |55 14
 27-- 7-|--46--50----36--64----21 9 |
 6 57 51 47 61 2 12 24
 60 | 13 3 54 |
 37-----20-----30-----43

101/ 1/ 18/ 27/ 52/169/ 52702684#
 1-----56-----58-----15
 |63 41 8 |18
 62 34 43 23 5 25 20 48
 |35 32----54--10----28--39----13--49
 40 29 | 17 12 31 38 42 51 |
 |26 4 16 21 33 59 |55 46
 27-- 7-|--14--50----36--64----53 9 |
 6 57 19 47 61 2 44 24
 60 | 45 3 22 |
 37-----52-----30-----11

102/ 1/ 18/ 27/ 52/170/ 53141644#
 1-----56-----58-----15
 |63 41 8 |18
 62 34 43 23 5 25 20 48
 |35 32----21--10----28--39----46--49
 40 29 | 17 12 31 38 42 51 |
 |26 4 16 54 33 59 |55 13
 27-- 7-|--14--50----36--64----53 9 |
 6 57 52 47 61 2 11 24
 60 | 45 3 22 |
 37-----19-----30-----44

158/ 11/ 27/ 35/ 40/ 61/ 53608684#
 1-----48-----51-----30
 |32 37 12 |49
 62 34 7 27 42 54 19 15
 | 5 63----44--18----55--13----26--36
 11 59 | 50 22 31 9 38 40 |
 |52 4 29 57 2 24 |47 45
 56--14-|--25--35----6--64----43 17 |
 41 53 20 16 61 33 8 28
 23 | 46 3 58 |
 10-----39-----60-----21

159/ 1/ 24/ 35/ 43/ 61/ 54098354#
 1-----24-----57-----48
 |32 37 12 |49
 62 34 13 27 36 54 19 15
 | 5 63----26--42----55-- 7----44--18
 11 59 | 50 40 31 9 38 22 |
 |58 4 47 51 2 30 |23 45
 56-- 8-|--43--17----6--64----25 41 |
 35 53 20 16 61 33 14 28
 29 | 46 3 52 |
 10-----21-----60-----39

160/ 1/ 18/ 30/ 51/100/ 54257192#
 1-----56-----58-----15
 |32 10 39 |49
 62 34 11 23 35 25 22 48
 | 4 63----53--41----29-- 8----44--18
 40 59 | 17 14 31 38 42 19 |
 |57 5 47 52 2 28 |24 45
 27-- 7-|--46--50----6--64----51 9 |
 37 26 20 16 60 33 13 55
 30 | 43 3 54 |
 36-----21-----61-----12

198/ 1/ 18/ 27/ 52/ 72/ 84630817#
 1-----56-----58-----15
 |32 41 39 |18
 62 34 11 23 5 25 52 48
 |35 63----53--10----28-- 8----14--49
 40 29 | 17 44 31 38 42 19 |
 |57 4 16 22 2 59 |55 45
 27-- 7-|--46--50----36--64----21 9 |
 6 26 20 47 61 33 43 24
 60 | 13 3 54 |
 37-----51-----30-----12

199/ 1/ 18/ 27/ 52/ 61/ 85947697#
 1-----56-----57-----16
 |32 41 40 |17
 62 34 11 23 6 26 51 47
 |35 63----22--10----27-- 7----46--50
 39 29 | 18 44 31 37 42 20 |
 |58 4 15 53 2 60 |55 13
 28-- 8-|--45--49----36--64----21 9 |
 5 25 52 48 61 33 12 24
 59 | 14 3 54 |
 38-----19-----30-----43

200/ 1/ 18/ 27/ 52/ 61/ 87978997#
 1-----56-----57-----16
 |32 41 40 |17
 62 34 43 23 6 26 19 47
 |35 63-----54--10-----27-- 7-----14--50
 39 29 | 18 12 31 37 42 52 |
 |58 4 15 21 2 60 |55 45
 28-- 8--|--13--49-----36--64-----53 9 |
 5 25 20 48 61 33 44 24
 59 | 46 3 22 |
 38-----51-----30-----11

201/ 1/ 18/ 27/ 52/ 72/ 89577457#
 1-----56-----58-----15
 |32 41 39 |18
 62 34 43 23 5 25 20 48
 |35 63-----21--10-----28-- 8-----46--49
 40 29 | 17 12 31 38 42 51 |
 |57 4 16 54 2 59 |55 13
 27-- 7--|--14--50-----36--64-----53 9 |
 6 26 52 47 61 33 11 24
 60 | 45 3 22 |
 37-----19-----30-----44

211/ 1/ 18/ 27/ 52/ 62/ 90894337#
 1-----56-----57-----16
 |32 41 7 |50
 62 34 11 23 6 26 51 47
 |35 63-----22--10-----60--40-----13--17
 39 29 | 18 44 31 37 42 20 |
 |25 4 48 53 2 27 |55 46
 28-- 8--|--45--49-----36--64-----21 9 |
 38 58 19 15 61 33 12 24
 59 | 14 3 54 |
 5-----52-----30-----43

212/ 1/ 18/ 27/ 52/ 63/ 92101417#
 1-----56-----57-----16
 |32 41 7 |50
 62 34 43 23 6 26 19 47
 |35 63-----21--10-----60--40-----14--17
 39 29 | 18 12 31 37 42 52 |
 |25 4 48 54 2 27 |55 45
 28-- 8--|--13--49-----36--64-----53 9 |
 38 58 20 15 61 33 11 24
 59 | 46 3 22 |
 5-----51-----30-----44

.

257/ 1/ 18/ 30/ 51/100/ 130084493#
 1-----56-----58-----15
 |32 10 39 |49
 30 34 43 23 3 25 54 48
 |36 63-----21--41-----61-- 8-----12--18
 40 27 | 17 46 31 6 42 51 |
 |57 37 47 20 2 60 |24 13
 59-- 7--|--14--50-----38--64-----19 9 |
 5 26 52 16 28 33 45 55
 62 | 11 35 22 |
 4-----53-----29-----44

258/ 1/ 18/ 30/ 51/ 96/ 131342609#
 1-----56-----58-----15
 |32 41 39 |18
 30 34 43 23 3 25 54 48
 |36 63-----21--10-----61-- 8-----12--49
 40 27 | 17 46 31 6 42 51 |
 |57 37 16 20 2 60 |55 13
 59-- 7--|--14--50-----38--64-----19 9 |
 5 26 52 47 28 33 45 24
 62 | 11 35 22 |
 4-----53-----29-----44

259/ 1/ 18/ 30/ 51/ 96/ 132706877#
 1-----24-----58-----47
 |32 9 39 |50
 30 34 43 55 3 25 54 16
 |36 63-----21--42-----61-- 8-----12--17
 40 27 | 49 46 31 6 10 51 |
 |57 37 48 20 2 60 |23 13
 59-- 7--|--14--18-----38--64-----19 41 |
 5 26 52 15 28 33 45 56
 62 | 11 35 22 |
 4-----53-----29-----44

260/ 1/ 18/ 30/ 51/100/ 133099197#
 1-----24-----58-----47
 |32 42 39 |17
 30 34 43 55 3 25 54 16
 |36 63-----21-- 9-----61-- 8-----12--50
 40 27 | 49 46 31 6 10 51 |
 |57 37 15 20 2 60 |56 13
 59-- 7--|--14--18-----38--64-----19 41 |
 5 26 52 48 28 33 45 23
 62 | 11 35 22 |
 4-----53-----29-----44

261/ 1/ 22/ 38/ 41/ 61/ 133465537#
 1-----62-----19-----48
 |32 9 40 |49
 30 34 7 55 42 26 51 15
 |37 63-----22-- 4-----59--45-----12--18
 39 27 | 50 44 31 5 10 54 |
 |20 36 47 57 2 24 |61 13
 60--46--|--11--17-----38--64-----21 3 |
 41 25 52 16 29 33 8 56
 23 | 14 35 58 |
 6-----53-----28-----43

262/ 8/ 27/ 34/ 41/ 61/ 133630953#
 1-----62-----19-----48
 |32 49 44 | 5
 30 34 51 15 42 22 7 59
 |37 63-----26-- 4-----55--45-----12--18
 43 27 | 6 40 31 9 50 54 |
 |20 36 47 13 2 24 |61 57
 56--46--|--11--17-----38--64-----25 3 |
 41 21 8 60 29 33 52 16
 23 | 58 35 14 |
 10-----53-----28-----39

[Count of Compositi ons = 133856760] OK!

I was much surprised at the big count of solutions, but I was more surprised with the fact I could count them all up to the last, though I took about 6 hours to do all by my new machine Mac G5. I really had no idea about that.

All of them are nothing but 'Complete Euler Cubes' of Order 4.

Theoretically speaking, the true total count of solutions should be 1070854080 (=133856760 x 8), without limiting the value 1 to n1.

But I can not yet calculate the total count of every 'Complete' MC444 including 'Non-Euler' type. I can not imagine how great the size of it is even now.

To tell the truth, I had taken a long rest to study anything new about this topic, before my Old Master, Mr. Gakuho Abe encouraged and recommended me to do that job. He said, "You should do it now, for you can do it, I believe." when he dropped in me in early autumn, 2005. I must say here that I thank him and I owe him very much.

3. How to build 'Composite and Complete' Magic Cubes of Order 4

Let's build 'Composite and Complete' MC444 next only with '0' and '1', shall we?

Add the next 'Composite Conditions' to the basic definitions of previous 'Complete' type, for our new object is really a 'Simultaneous' type of Magic Form that has both properties at the same time.

* Composite Conditions: C=2 *

n1+n2+n5+n6=C	... cp01;	n5+n9+n21+n25=C	... cp23;	n17+n18+n33+n34=C	... cp43;
n2+n3+n6+n7=C	... cp02;	n6+n10+n22+n26=C	... cp24;	n18+n19+n34+n35=C	... cp44;
n3+n4+n7+n8=C	... cp03;	n9+n10+n25+n26=C	... cp25;	n19+n20+n35+n36=C	... cp45;
n5+n6+n9+n10=C	... cp04;	n21+n22+n25+n26=C	... cp26;	n17+n21+n33+n37=C	... cp46;
n6+n7+n10+n11=C	... cp05;	n7+n11+n23+n27=C	... cp27;	n18+n22+n34+n38=C	... cp47;
n7+n8+n11+n12=C	... cp06;	n10+n11+n26+n27=C	... cp28;	n21+n22+n37+n38=C	... cp48;
n9+n10+n13+n14=C	... cp07;	n22+n23+n26+n27=C	... cp29;	n33+n34+n37+n38=C	... cp49;
n10+n11+n14+n15=C	... cp08;	n8+n12+n24+n28=C	... cp30;	n19+n23+n35+n39=C	... cp50;
n11+n12+n15+n16=C	... cp09;	n11+n12+n27+n28=C	... cp31;	n22+n23+n38+n39=C	... cp51;
n1+n2+n17+n18=C	... cp10;	n23+n24+n27+n28=C	... cp32;	n34+n35+n38+n39=C	... cp52;
n2+n3+n18+n19=C	... cp11;	n9+n13+n25+n29=C	... cp33;
n3+n4+n19+n20=C	... cp12;	n10+n14+n26+n30=C	... cp34;
n1+n5+n17+n21=C	... cp13;	n13+n14+n29+n30=C	... cp35;	n33+n34+n49+n50=C	... cp76;
n2+n6+n18+n22=C	... cp14;	n25+n26+n29+n30=C	... cp36;	n34+n35+n50+n51=C	... cp77;
n5+n6+n21+n22=C	... cp15;	n11+n15+n27+n31=C	... cp37;	n35+n36+n51+n52=C	... cp78;
n17+n18+n21+n22=C	... cp16;	n14+n15+n30+n31=C	... cp38;	n33+n37+n49+n53=C	... cp79;
n3+n7+n19+n23=C	... cp17;	n26+n27+n30+n31=C	... cp39;	n34+n38+n50+n54=C	... cp81;
n6+n7+n22+n23=C	... cp18;	n12+n16+n28+n32=C	... cp40;	n37+n38+n53+n54=C	... cp82;
n18+n19+n22+n23=C	... cp19;	n15+n16+n31+n32=C	... cp41;	n50+n51+n53+n54=C	... cp83;
n4+n8+n20+n24=C	... cp20;	n27+n28+n31+n32=C	... cp42;
n7+n8+n23+n24=C	... cp21;				
n19+n20+n23+n24=C	... cp22;				

(1) Let's compose every possible layer unit that has both the properties of 'Complete' and the ones of 'Composite' MC444 at the same time by binary number system.

(2) Pick up any 6 units and combine and assume them as the decomposed layers, so that you could calculate and build an object solution by the next equation.

$$V_n = A_n \cdot 32 + B_n \cdot 16 + C_n \cdot 8 + D_n \cdot 4 + E_n \cdot 2 + F_n \cdot 1 + 1 \quad (n=1, 2, 3, 4, \dots, 63, 64)$$

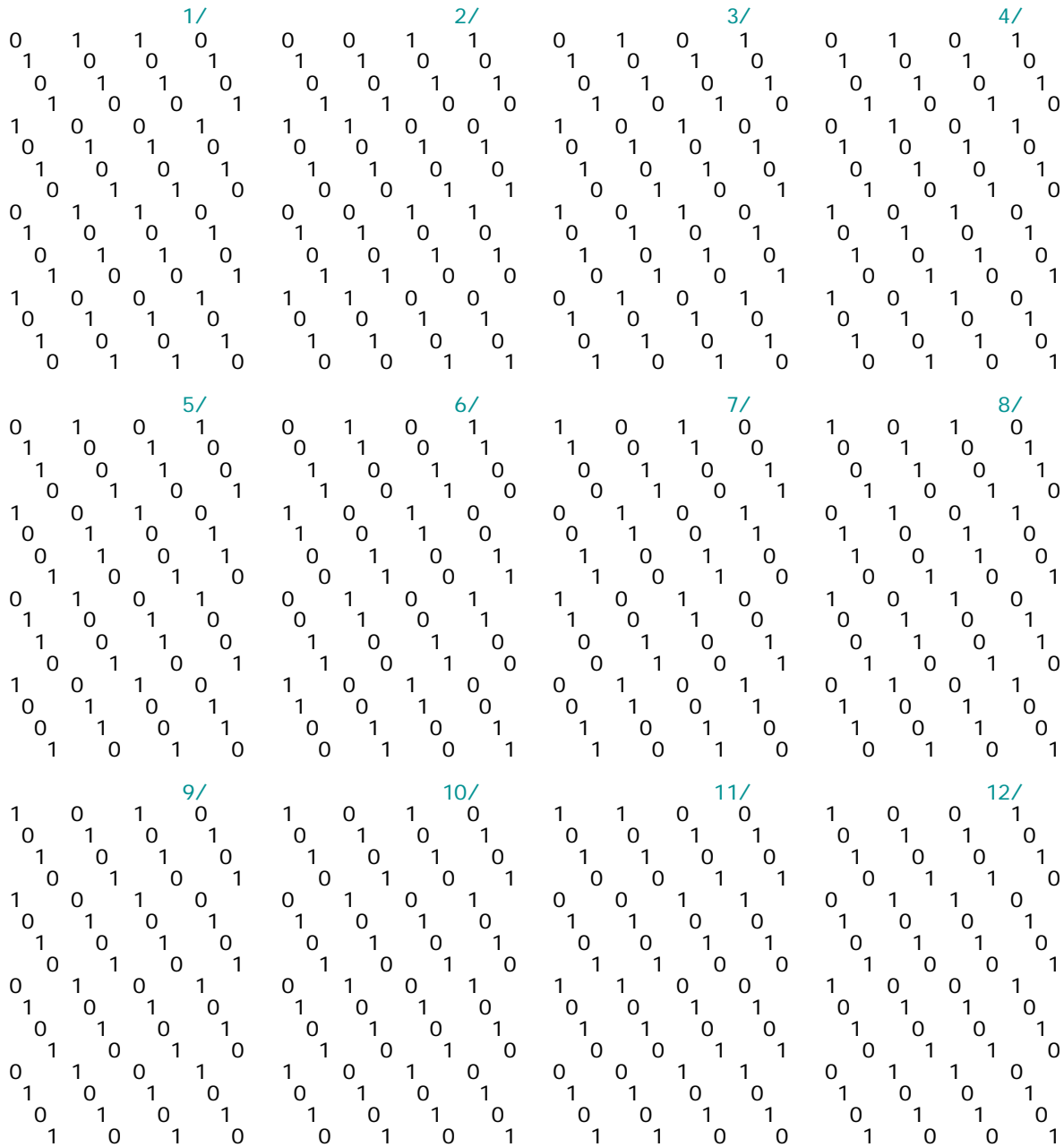
(3) Check if it is against the definition(3) or not, and find the correct answer.

(4) List out the standard solutions only under the list-forming inequality conditions.

The next lists show the result of my recent calculations.

** 'Complete Euler Type' of 'Composite & Complete' Magic Cubes ***
 ** of Order 4 Composed by 'New Euler's Method' of Binary System **

[Layer Uni ts]



[Reference Table of Matching Digi ts]

[Count of Layer Uuni ts = 12]

*	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

** Compositi ons of "C & C" Magi c Cubes 4x4x4: (Part) **

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

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

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

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

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

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

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

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

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

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

1/ 2/ 9/ 3/ 5/ 6/ 85#
 9-----40-----57-----24
 |55 26 7 |42
 64 12 17 37 16 60 33 21
 | 2 54-----47--27-----50--6-----31--43
 5 61 | 44 20 53 13 28 36 |
 |59 3 22 46 11 51 |38 30
 52--8-|--29--41-----4--56-----45 25 |
 14 58 35 23 62 10 19 39
 49 | 32 1 48 |
 15-----34-----63-----18

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

1/ 3/ 4/ 2/ 5/ 6/ 145#
 1-----60-----37-----32
 |63 6 27 |34
 56 4 13 57 20 40 41 29
 |10 62-----51--7-----46--26-----23--35
 25 53 | 36 16 61 17 8 44 |
 |39 11 30 50 3 47 |58 22
 48--28-|--21--33-----12--64-----49 5 |
 18 38 43 31 54 2 15 59
 45 | 24 9 52 |
 19-----42-----55-----14

1/ 3/ 5/ 2/ 4/ 6/ 193#
 1-----60-----37-----32
 |63 6 27 |34
 62 10 7 51 26 46 35 23
 | 4 56-----57--13-----40--20-----29--41
 19 53 | 42 16 55 17 14 44 |
 |45 11 24 50 9 47 |52 22
 48--28-|--21--33-----12--64-----49 5 |
 18 38 43 31 54 2 15 59
 39 | 30 3 58 |
 25-----36-----61-----8

1/ 3/ 6/ 2/ 4/ 5/ 217#
 1-----60-----37-----32
 |56 13 20 |41
 62 10 7 51 26 46 35 23
 |11 63-----50--6-----47--27-----22--34
 19 53 | 42 16 55 17 14 44 |
 |38 4 31 57 2 40 |59 29
 48--28-|--21--33-----12--64-----49 5 |
 25 45 36 24 61 9 8 52
 39 | 30 3 58 |
 18-----43-----54-----15

1/ 3/ 8/ 2/ 4/ 6/ 265#
 9-----52-----45-----24
 |55 14 19 |42
 54 2 15 59 18 38 43 31
 |12 64-----49--5-----48--28-----21--33
 27 61 | 34 8 63 25 6 36 |
 |37 3 32 58 1 39 |60 30
 40--20-|--29--41-----4--56-----57 13 |
 26 46 35 23 62 10 7 51
 47 | 22 11 50 |
 17-----44-----53-----16

1/ 4/ 2/ 3/ 5/ 6/ 289#
 1-----56-----41-----32
 |63 10 23 |34
 48 4 25 53 8 44 49 29
 |18 62-----39--11-----58--22-----15--35
 21 45 | 36 28 61 5 12 52 |
 |43 19 30 38 3 59 |54 14
 60--24-|--13--33-----20--64-----37 9 |
 6 42 51 31 46 2 27 55
 57 | 16 17 40 |
 7-----50-----47-----26

1/ 6/ 2/ 3/ 4/ 5/ 385#
 1-----56-----41-----32
 |48 25 8 |49
 62 18 11 39 22 58 35 15
 |19 63-----38--10-----59--23-----14--34
 7 45 | 50 28 47 5 26 52 |
 |42 4 31 53 2 44 |55 29
 60--24-|--13--33-----20--64-----37 9 |
 21 57 36 16 61 17 12 40
 43 | 30 3 54 |
 6-----51-----46-----27

2/ 1/ 3/ 4/ 5/ 6/ 481#
 1-----32-----49-----48
 |63 34 15 |18
 60 4 37 29 12 52 21 45
 | 6 62-----27--35-----54--14-----43--19
 13 57 | 20 40 61 9 36 24 |
 |51 7 46 26 3 55 |30 42
 56--16-|--41--17-----8--64-----25 33 |
 10 50 23 47 58 2 39 31
 53 | 44 5 28 |
 11-----22-----59-----38

2/ 4/ 1/ 3/ 5/ 6/ 577#
 1-----32-----41-----56
 |63 34 23 |10
 48 4 49 29 8 44 25 53
 |18 62-----15--35-----58--22-----39--11
 21 45 | 12 52 61 5 36 28 |
 |43 19 54 14 3 59 |30 38
 60--24-|--37--9-----20--64-----13 33 |
 6 42 27 55 46 2 51 31
 57 | 40 17 16 |
 7-----26-----47-----50

2/ 6/ 1/ 3/ 4/ 5/ 593#
 1-----32-----41-----56
 |48 49 8 |25
 62 18 35 15 22 58 11 39
 |19 63-----14--34-----59--23-----38--10
 7 45 | 26 52 47 5 50 28 |
 |42 4 55 29 2 44 |31 53
 60--24-|--37--9-----20--64-----13 33 |
 21 57 12 40 61 17 36 16
 43 | 54 3 30 |
 6-----27-----46-----51

2/ 7/ 1/ 3/ 4/ 5/ 609#
 17-----16-----57-----40
 |64 33 24 | 9
 46 2 51 31 6 42 27 55
 | 3 47-----30--50-----43--7-----54--26
 23 61 | 10 36 63 21 34 12 |
 |58 20 39 13 18 60 |15 37
 44--8-|--53--25-----4--48-----29 49 |
 5 41 28 56 45 1 52 32
 59 | 38 19 14 |
 22-----11-----62-----35

2/ 9/ 1/ 3/ 5/ 6/ 625#
 17-----16-----57-----40
 |47 50 7 |26
 64 20 33 13 24 60 9 37
 | 2 46-----31--51-----42--6-----55--27
 5 61 | 28 36 45 21 52 12 |
 |59 3 38 30 19 43 |14 54
 44--8-|--53--25-----4--48-----29 49 |
 22 58 11 39 62 18 35 15
 41 | 56 1 32 |
 23-----10-----63-----34

4/ 1/ 2/ 3/ 5/ 6/ 641#
 1-----56-----25-----48
 |63 10 39 |18
 32 4 41 53 8 28 49 45
 |34 62-----23--11-----58--38-----15--19
 37 29 | 20 44 61 5 12 52 |
 |27 35 46 22 3 59 |54 14
 60--40-|--13--17-----36--64-----21 9 |
 6 26 51 47 30 2 43 55
 57 | 16 33 24 |
 7-----50-----31-----42

4/ 2/ 1/ 3/ 5/ 6/ 737#
 1-----48-----25-----56
 |63 18 39 |10
 32 4 49 45 8 28 41 53
 |34 62-----15--19-----58--38-----23--11
 37 29 | 12 52 61 5 20 44 |
 |27 35 54 14 3 59 |46 22
 60--40-|--21--9-----36--64-----13 17 |
 6 26 43 55 30 2 51 47
 57 | 24 33 16 |
 7-----42-----31-----50

4/ 6/ 1/ 2/ 3/ 5/ 753#
 1-----60-----13-----56
 |48 21 36 |25
 32 18 37 43 20 30 41 39
 |49 63-----12--6-----61--51-----8--10
 35 15 | 26 54 47 3 22 58 |
 |14 34 55 27 2 46 |59 23
 62--52-|--7--9-----50--64-----11 5 |
 19 29 42 40 31 17 38 44
 45 | 24 33 28 |
 4-----57-----16-----53

4/ 7/ 1/ 2/ 3/ 5/ 769#
 17-----44-----29-----40
 |64 5 52 | 9
 16 2 53 59 4 14 57 55
 |33 47-----28--22-----45--35-----24--26
 51 31 | 10 38 63 19 6 42 |
 |30 50 39 11 18 62 |43 7
 46--36-|--23--25-----34--48-----27 21 |
 3 13 58 56 15 1 54 60
 61 | 8 49 12 |
 20-----41-----32-----37

4/ 11/ 1/ 3/ 5/ 6/ 785#
 17-----64-----9-----40
 |47 2 55 |26
 16 20 33 61 24 12 57 37
 |50 46-----31--3-----42--54-----7--27
 53 13 | 28 36 45 21 4 60 |
 |11 51 38 30 19 43 |62 6
 44--56-|--5--25-----52--48-----29 1 |
 22 10 59 39 14 18 35 63
 41 | 8 49 32 |
 23-----58-----15-----34

6/ 1/ 2/ 3/ 4/ 5/ 801#
 1-----56-----25-----48
 |32 41 8 |49
 62 34 11 23 38 58 19 15
 |35 63-----22--10-----59--39-----14--18
 7 29 | 50 44 31 5 42 52 |
 |26 4 47 53 2 28 |55 45
 60--40-|--13--17-----36--64-----21 9 |
 37 57 20 16 61 33 12 24
 27 | 46 3 54 |
 6-----51-----30-----43

6/ 2/ 1/ 3/ 4/ 5/ 897#
 1-----48-----25-----56
 |32 49 8 |41
 62 34 19 15 38 58 11 23
 |35 63-----14--18-----59--39-----22--10
 7 29 | 42 52 31 5 50 44 |
 |26 4 55 45 2 28 |47 53
 60--40-|--21--9-----36--64-----13 17 |
 37 57 12 24 61 33 20 16
 27 | 54 3 46 |
 6-----43-----30-----51

```

6/ 4/ 1/ 2/ 3/ 5/ 913#
1-----60-----13-----56
|32      37      20      |41
48 34   21 27   36 46   25 23
|49 63-----12-- 6-----61--51----- 8--10
19 15 | 42 54   31  3   38 58 |
|14 18   55 43   2 30   |59 39
62--52-|-- 7-- 9-----50--64-----11  5 |
 35 45   26 24   47 33   22 28
  29 |      40      17      44 |
    4-----57-----16-----53

```

```

6/ 9/ 1/ 2/ 3/ 5/ 929#
17-----44-----29-----40
|16      53      4      |57
64 50   5 11   52 62   9  7
|33 47-----28--22-----45--35-----24--26
3 31 | 58 38   15 19   54 42 |
|30 2   39 59   18 14   |43 55
46--36-|--23--25-----34--48-----27 21 |
 51 61   10  8   63 49   6 12
  13 |      56      1      60 |
    20-----41-----32-----37

```

```

6/ 11/ 1/ 3/ 4/ 5/ 945#
17-----64----- 9-----40
|16      33      24      |57
46 50   3 31   54 42   27  7
|51 47-----30-- 2-----43--55----- 6--26
23 13 | 58 36   15 21   34 60 |
|10 20   39 61   18 12   |63 37
44--56-|-- 5--25-----52--48-----29  1 |
 53 41   28  8   45 49   4 32
  11 |      38      19      62 |
    22-----59-----14-----35

```

[Count of Compositions = 960] OK!

This result is just the same with the one of our past composition of 'C&C' MC444. That means all 'C&C' MC444 are nothing but "Complete Euler Cubes of order 4". The set of 960 standard solutions is considered to be the smallest set, theoretically speaking. Because $6P_6 \times 2^6 = 720 \times 64 = 960 \times 48$. Nothing smaller is possible.

I remember we studied much about the most fundamental 15 solutions of this type in the past, but can we really find them among those compositions above?

I must report I could really find those fifteen by listing them out under the next inequality conditions in place of the standard ones.

$$(n1==1) \& (n4 > n13) \& (n13 > n49) \& (n2 > n4) \& (n5 > n13) \& (n17 > n49)$$

Each of them is really the same member we have ever known very well.

We have succeeded in reconstructing all the objects we have wanted to see again.

The factors $960 = 15 \times 64$ are reasonable enough to be accepted.

Our 'New Euler's Method' proves to be really powerful enough to reconstruct them.

4. How to build 'Composite and Pan-triagonal' Magic Cubes 4x4x4

```

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

```

* Pan-triagonal Conditions: C=2 *

```

n1+n22+n43+n64=C ... pd01; | n1+n24+n43+n62=C ... pd02;
n1+n30+n43+n56=C ... pd03; | n1+n32+n43+n54=C ... pd04;
n2+n23+n44+n61=C ... pd05; | n2+n21+n44+n63=C ... pd06;
n2+n31+n44+n53=C ... pd07; | n2+n29+n44+n55=C ... pd08;
n3+n24+n41+n62=C ... pd09; | n3+n22+n41+n64=C ... pd10;
n3+n32+n41+n54=C ... pd11; | n3+n30+n41+n56=C ... pd12;
n4+n21+n42+n63=C ... pd13; | n4+n23+n42+n61=C ... pd14;
n4+n29+n42+n55=C ... pd15; | n4+n31+n42+n53=C ... pd16;
n5+n26+n47+n52=C ... pd17; | n5+n28+n47+n50=C ... pd18;
n5+n18+n47+n60=C ... pd19; | n5+n20+n47+n58=C ... pd20;
n6+n27+n48+n49=C ... pd21; | n6+n25+n48+n51=C ... pd22;
n6+n19+n48+n57=C ... pd23; | n6+n17+n48+n59=C ... pd24;
n7+n28+n45+n50=C ... pd25; | n7+n26+n45+n52=C ... pd26;
n7+n20+n45+n58=C ... pd27; | n7+n18+n45+n60=C ... pd28;
n8+n25+n46+n51=C ... pd29; | n8+n27+n46+n49=C ... pd30;
n8+n17+n46+n59=C ... pd31; | n8+n19+n46+n57=C ... pd32;
n9+n30+n35+n56=C ... pd33; | n9+n32+n35+n54=C ... pd34;
n9+n22+n35+n64=C ... pd35; | n9+n24+n35+n62=C ... pd36;
n10+n31+n36+n53=C ... pd37; | n10+n29+n36+n55=C ... pd38;
n10+n23+n36+n61=C ... pd39; | n10+n21+n36+n63=C ... pd40;
n11+n32+n33+n54=C ... pd41; | n11+n30+n33+n56=C ... pd42;
n11+n24+n33+n62=C ... pd43; | n11+n22+n33+n64=C ... pd44;
n12+n29+n34+n55=C ... pd45; | n12+n31+n34+n53=C ... pd46;
n12+n21+n34+n63=C ... pd47; | n12+n23+n34+n61=C ... pd48;
n13+n18+n39+n60=C ... pd49; | n13+n20+n39+n58=C ... pd50;
n13+n26+n39+n52=C ... pd51; | n13+n28+n39+n50=C ... pd52;
n14+n19+n40+n57=C ... pd53; | n14+n17+n40+n59=C ... pd54;
n14+n27+n40+n49=C ... pd55; | n14+n25+n40+n51=C ... pd56;
n15+n20+n37+n58=C ... pd57; | n15+n18+n37+n60=C ... pd58;
n15+n28+n37+n50=C ... pd59; | n15+n26+n37+n52=C ... pd60;
n16+n17+n38+n59=C ... pd61; | n16+n19+n38+n57=C ... pd62;
n16+n25+n38+n51=C ... pd63; | n16+n27+n38+n49=C ... pd64;

```

How about another type of magic cubes we have known very well? Let's make those 'Composite and Pan-triagonal' magic cubes 4x4x4 next, and select those 15x7(=105) Fundamental Solutions among them.

We have to replace "Complete Conditions" for "Pan-triagonal Conditions" above.

Since we do not use anything like 'Complementary Pairs', we have to define each single variable in one procedure. This should make your program list quite long, but you must not give it up before you get the result of your experiment.

The next program list is a part of my recent dictation.

```

/** 'Complete Euler Type' of 'Composite & Pandiagonal' Magic Cubes **/
/** of Order 4 Composed by 'New Euler's Method' of Binary System **/
/** 'NEulerMC4CP.c' dictated by Kanji Setsuda **/
/** Sep. 10, '03; Sep. 18, '05 on MacOS Xcode 1.5 **/
/**/
#include <stdio.h>
/**/
/* Global Var. */
short int cnt;
short cntr[3];
short cnt2, cnt3;
short LSM, CC;
short u1, u2, u3, u4, u5, u6;
short nm[65], flg[65];
short anm[72], bnm[72], cnm[72];
short df[49][2], pd[65][2];
short tlu[15][65];
short mtc[15][15];
short cn1[65], cn43[65];

```

```

/**/
/* Main Program */
main(){
short m, n;
printf("\n** 'Complete Euler Type' of 'Composite & Pandiagonal' Magic Cubes **\n");
printf("** of Order 4 Composed by 'New Euler's Method' of Binary System **\n");
LSM=2; CC=1; cnt=0;
for(n=0; n<65; n++){nm[n]=-1; flg[n]=0;}
for(m=0; m<48; m++){for(n=0; n<2; n++){df[m][n]=0;}}
for(m=0; m<64; m++){for(n=0; n<2; n++){pd[m][n]=0;}}
deep01();
prc4lu();
printf("\n [Count of Layer Units = %d]\n", cnt);
printf("\n ** Compositions of 'C & P' MC444: (Part) **\n", cnt);
cnt=0; cnt3=0;
cmbcmp();
if(cnt3>0){pr1ans();}
printf("\n [Count of Compositions = %d]\n", cnt);
printf("\n [Counts according to n1]\n");
prcn1();
printf("\n [Counts according to n43]\n");
prcn43();
printf("\n OK!\n");
return 0;
}
/**/
/* Begin the Search */
/* Set n1 */
void deep01(){
short a;
for(a=0; a<2; a++){
if((df[1][a]<2)&&(df[17][a]<2)&&(df[33][a]<2)){
if((pd[1][a]<2)&&(pd[2][a]<2)&&(pd[3][a]<2)&&(pd[4][a]<2)){
nm[1]=a;
df[1][a]++; df[17][a]++; df[33][a]++;
pd[1][a]++; pd[2][a]++; pd[3][a]++; pd[4][a]++;
deep02();
df[1][a]--; df[17][a]--; df[33][a]--;
pd[1][a]--; pd[2][a]--; pd[3][a]--; pd[4][a]--;
}}}
}
}
/* Set n2 */
void deep02(){
short a;
for(a=1; a>=0; a--){
if((df[1][a]<2)&&(df[18][a]<2)&&(df[34][a]<2)){
if((pd[5][a]<2)&&(pd[6][a]<2)&&(pd[7][a]<2)&&(pd[8][a]<2)){
nm[2]=a;
df[1][a]++; df[18][a]++; df[34][a]++;
pd[5][a]++; pd[6][a]++; pd[7][a]++; pd[8][a]++;
deep03();
df[1][a]--; df[18][a]--; df[34][a]--;
pd[5][a]--; pd[6][a]--; pd[7][a]--; pd[8][a]--;
}}}
}
}
/* Set n3 & n41 */
void deep03(){
short a;
for(a=0; a<2; a++){
if((df[1][a]<2)&&(df[19][a]<2)&&(df[35][a]<2)){
if((pd[9][a]<2)&&(pd[10][a]<2)&&(pd[11][a]<2)&&(pd[12][a]<2)){

```

```

    nm[3]=a;
    df[1][a]++; df[19][a]++; df[35][a]++;
    pd[9][a]++; pd[10][a]++; pd[11][a]++; pd[12][a]++;
    deep04();
    df[1][a]--; df[19][a]--; df[35][a]--;
    pd[9][a]--; pd[10][a]--; pd[11][a]--; pd[12][a]--;
  }}
}
}
/* Set n4 */
void deep04(){
  short a;
  for(a=1; a>=0; a--){
    if((df[1][a]<2)&&(df[20][a]<2)&&(df[36][a]<2)){
      if((pd[13][a]<2)&&(pd[14][a]<2)&&(pd[15][a]<2)&&(pd[16][a]<2)){
        nm[4]=a;
        df[1][a]++; df[20][a]++; df[36][a]++;
        pd[13][a]++; pd[14][a]++; pd[15][a]++; pd[16][a]++;
        deep05();
        df[1][a]--; df[20][a]--; df[36][a]--;
        pd[13][a]--; pd[14][a]--; pd[15][a]--; pd[16][a]--;
      }}
    }
  }
}
/* Set n5 */
void deep05(){
  short a;
  for(a=1; a>=0; a--){
    if((df[2][a]<2)&&(df[21][a]<2)&&(df[33][a]<2)){
      if((pd[17][a]<2)&&(pd[18][a]<2)&&(pd[19][a]<2)&&(pd[20][a]<2)){
        nm[5]=a;
        df[2][a]++; df[21][a]++; df[33][a]++;
        pd[17][a]++; pd[18][a]++; pd[19][a]++; pd[20][a]++;
        deep06();
        df[2][a]--; df[21][a]--; df[33][a]--;
        pd[17][a]--; pd[18][a]--; pd[19][a]--; pd[20][a]--;
      }}
    }
  }
}
/* Set n6 & n1+n2+n5+n6==C? */
void deep06(){
  short a;
  for(a=0; a<2; a++){
    if((df[2][a]<2)&&(df[22][a]<2)&&(df[34][a]<2)){
      if((pd[21][a]<2)&&(pd[22][a]<2)&&(pd[23][a]<2)&&(pd[24][a]<2)){
        if(nm[1]+nm[2]+nm[5]+a==LSM){nm[6]=a;
          df[2][a]++; df[22][a]++; df[34][a]++;
          pd[21][a]++; pd[22][a]++; pd[23][a]++; pd[24][a]++;
          deep07();
          df[2][a]--; df[22][a]--; df[34][a]--;
          pd[21][a]--; pd[22][a]--; pd[23][a]--; pd[24][a]--;
        }}}
    }
  }
}
/* Set n7 & n2+n3+n6+n7==C?*/
void deep07(){
  short a;
  for(a=1; a>=0; a--){
    if((df[2][a]<2)&&(df[23][a]<2)&&(df[35][a]<2)){
      if((pd[25][a]<2)&&(pd[26][a]<2)&&(pd[27][a]<2)&&(pd[28][a]<2)){
        if(nm[2]+nm[3]+nm[6]+a==LSM){nm[7]=a;
          df[2][a]++; df[23][a]++; df[35][a]++;
          pd[25][a]++; pd[26][a]++; pd[27][a]++; pd[28][a]++;
          deep08();
        }
      }
    }
  }
}

```

```

        df[2][a]--; df[23][a]--; df[35][a]--;
        pd[25][a]--; pd[26][a]--; pd[27][a]--; pd[28][a]--;
    }}}
}
}
/* Set n8 & n3+n4+n7+n8==C? */
void deep08(){
    short a;
    for(a=0; a<2; a++){
        if((df[2][a]<2)&&(df[24][a]<2)&&(df[36][a]<2)){
            if((pd[29][a]<2)&&(pd[30][a]<2)&&(pd[31][a]<2)&&(pd[32][a]<2)){
                if(nm[3]+nm[4]+nm[7]+a==LSM){nm[8]=a;
                    df[2][a]++; df[24][a]++; df[36][a]++;
                    pd[29][a]++; pd[30][a]++; pd[31][a]++; pd[32][a]++;
                    deep09();
                    df[2][a]--; df[24][a]--; df[36][a]--;
                    pd[29][a]--; pd[30][a]--; pd[31][a]--; pd[32][a]--;
                }}}
        }
    }
}
/* Set n9 */
void deep09(){
    short a;
    for(a=0; a<2; a++){
        if((df[3][a]<2)&&(df[25][a]<2)&&(df[33][a]<2)){
            if((pd[33][a]<2)&&(pd[34][a]<2)&&(pd[35][a]<2)&&(pd[36][a]<2)){
                nm[9]=a;
                df[3][a]++; df[25][a]++; df[33][a]++;
                pd[33][a]++; pd[34][a]++; pd[35][a]++; pd[36][a]++;
                deep10();
                df[3][a]--; df[25][a]--; df[33][a]--;
                pd[33][a]--; pd[34][a]--; pd[35][a]--; pd[36][a]--;
            }}
        }
    }
}
/* Set n10 & n5+n6+n9+n10==C? */
void deep10(){
    short a;
    for(a=1; a>=0; a--){
        if((df[3][a]<2)&&(df[26][a]<2)&&(df[34][a]<2)){
            if((pd[37][a]<2)&&(pd[38][a]<2)&&(pd[39][a]<2)&&(pd[40][a]<2)){
                if(nm[5]+nm[6]+nm[9]+a==LSM){nm[10]=a;
                    df[3][a]++; df[26][a]++; df[34][a]++;
                    pd[37][a]++; pd[38][a]++; pd[39][a]++; pd[40][a]++;
                    deep11();
                    df[3][a]--; df[26][a]--; df[34][a]--;
                    pd[37][a]--; pd[38][a]--; pd[39][a]--; pd[40][a]--;
                }}}
        }
    }
}
/**/
. . . . .
/**/
/* Set n42 & n22+n26+n38+n42==C? & ... */
void deep42(){
    short a, cs1, cs2, cs3;
    for(a=1; a>=0; a--){
        if((df[11][a]<2)&&(df[26][a]<2)&&(df[42][a]<2)){
            if((pd[13][a]<2)&&(pd[14][a]<2)&&(pd[15][a]<2)&&(pd[16][a]<2)){
                cs1=nm[22]+nm[26]+nm[38]+a; cs2=nm[25]+nm[26]+nm[41]+a;
                cs3=nm[37]+nm[38]+nm[41]+a;
                if((cs1==LSM)&&(cs2==LSM)&&(cs3==LSM)){nm[42]=a;
                    df[11][a]++; df[26][a]++; df[42][a]++;
                    pd[13][a]++; pd[14][a]++; pd[15][a]++; pd[16][a]++;
                }
            }
        }
    }
}

```

```

        deep43();
        df[11][a]--; df[26][a]--; df[42][a]--;
        pd[13][a]--; pd[14][a]--; pd[15][a]--; pd[16][a]--;
    }}}
}
}
/* Set n43 & n23+n27+n39+n43==C? & ... */
void deep43(){
    short a, cs1, cs2, cs3;
    for(a=0; a<2; a++){
        if((df[11][a]<2)&&(df[27][a]<2)&&(df[43][a]<2)){
            if((pd[1][a]<2)&&(pd[2][a]<2)&&(pd[3][a]<2)&&(pd[4][a]<2)){
                cs1=nm[23]+nm[27]+nm[39]+a; cs2=nm[26]+nm[27]+nm[42]+a;
                cs3=nm[38]+nm[39]+nm[42]+a;
                if((cs1==LSM)&&(cs2==LSM)&&(cs3==LSM)){nm[43]=a;
                    df[11][a]++; df[27][a]++; df[43][a]++;
                    pd[1][a]++; pd[2][a]++; pd[3][a]++; pd[4][a]++;
                    deep44();
                    df[11][a]--; df[27][a]--; df[43][a]--;
                    pd[1][a]--; pd[2][a]--; pd[3][a]--; pd[4][a]--;
                }}}
    }
}
/* Set n44 & n24+n28+n40+n44==C? & ... */
void deep44(){
    short a, cs1, cs2, cs3;
    for(a=1; a>=0; a--){
        if((df[11][a]<2)&&(df[28][a]<2)&&(df[44][a]<2)){
            if((pd[5][a]<2)&&(pd[6][a]<2)&&(pd[7][a]<2)&&(pd[8][a]<2)){
                cs1=nm[24]+nm[28]+nm[40]+a; cs2=nm[27]+nm[28]+nm[43]+a;
                cs3=nm[39]+nm[40]+nm[43]+a;
                if((cs1==LSM)&&(cs2==LSM)&&(cs3==LSM)){nm[44]=a;
                    df[11][a]++; df[28][a]++; df[44][a]++;
                    pd[5][a]++; pd[6][a]++; pd[7][a]++; pd[8][a]++;
                    deep45();
                    df[11][a]--; df[28][a]--; df[44][a]--;
                    pd[5][a]--; pd[6][a]--; pd[7][a]--; pd[8][a]--;
                }}}
    }
}
/**/
. . . . .
/**/
/* Set n60 & n40+n44+n56+n60==C? & ... */
void deep60(){
    short a, cs1, cs2, cs3;
    for(a=0; a<2; a++){
        if((df[15][a]<2)&&(df[28][a]<2)&&(df[48][a]<2)){
            if((pd[19][a]<2)&&(pd[28][a]<2)&&(pd[49][a]<2)&&(pd[58][a]<2)){
                cs1=nm[40]+nm[44]+nm[56]+a; cs2=nm[43]+nm[44]+nm[59]+a;
                cs3=nm[55]+nm[56]+nm[59]+a;
                if((cs1==LSM)&&(cs2==LSM)&&(cs3==LSM)){nm[60]=a;
                    df[15][a]++; df[28][a]++; df[48][a]++;
                    pd[19][a]++; pd[28][a]++; pd[49][a]++; pd[58][a]++;
                    deep61();
                    df[15][a]--; df[28][a]--; df[48][a]--;
                    pd[19][a]--; pd[28][a]--; pd[49][a]--; pd[58][a]--;
                }}}
    }
}
/* Set n61 & n41+n45+n57+n61==C? */
void deep61(){
    short a;
    for(a=0; a<2; a++){

```

```

    if((df[16][a]<2)&&(df[29][a]<2)&&(df[45][a]<2)){
        if((pd[5][a]<2)&&(pd[14][a]<2)&&(pd[39][a]<2)&&(pd[48][a]<2)){
            if(nm[41]+nm[45]+nm[57]+a==LSM){nm[61]=a;
                df[16][a]++; df[29][a]++; df[45][a]++;
                pd[5][a]++; pd[14][a]++; pd[39][a]++; pd[48][a]++;
                deep62();
                df[16][a]--; df[29][a]--; df[45][a]--;
                pd[5][a]--; pd[14][a]--; pd[39][a]--; pd[48][a]--;
            }}}
    }
}
/* Set n62 & n42+n46+n58+n62==C? & ... */
void deep62(){
    short a, cs1, cs2, cs3;
    for(a=1; a>=0; a--){
        if((df[16][a]<2)&&(df[30][a]<2)&&(df[46][a]<2)){
            if((pd[2][a]<2)&&(pd[9][a]<2)&&(pd[36][a]<2)&&(pd[43][a]<2)){
                cs1=nm[42]+nm[46]+nm[58]+a; cs2=nm[45]+nm[46]+nm[61]+a;
                cs3=nm[57]+nm[58]+nm[61]+a;
                if((cs1==LSM)&&(cs2==LSM)&&(cs3==LSM)){nm[62]=a;
                    df[16][a]++; df[30][a]++; df[46][a]++;
                    pd[2][a]++; pd[9][a]++; pd[36][a]++; pd[43][a]++;
                    deep63();
                    df[16][a]--; df[30][a]--; df[46][a]--;
                    pd[2][a]--; pd[9][a]--; pd[36][a]--; pd[43][a]--;
                }}}
    }
}
/* Set n63 & n43+n47+n59+n63==C? & ... */
void deep63(){
    short a, cs1, cs2, cs3;
    for(a=0; a<2; a++){
        if((df[16][a]<2)&&(df[31][a]<2)&&(df[47][a]<2)){
            if((pd[6][a]<2)&&(pd[13][a]<2)&&(pd[40][a]<2)&&(pd[47][a]<2)){
                cs1=nm[43]+nm[47]+nm[59]+a; cs2=nm[46]+nm[47]+nm[62]+a;
                cs3=nm[58]+nm[59]+nm[62]+a;
                if((cs1==LSM)&&(cs2==LSM)&&(cs3==LSM)){nm[63]=a;
                    df[16][a]++; df[31][a]++; df[47][a]++;
                    pd[6][a]++; pd[13][a]++; pd[40][a]++; pd[47][a]++;
                    deep64();
                    df[16][a]--; df[31][a]--; df[47][a]--;
                    pd[6][a]--; pd[13][a]--; pd[40][a]--; pd[47][a]--;
                }}}
    }
}
/* Set n64 & n44+n48+n60+n64==C? & ... */
void deep64(){
    short a, cs1, cs2, cs3;
    for(a=1; a>=0; a--){
        if((df[16][a]<2)&&(df[32][a]<2)&&(df[48][a]<2)){
            if((pd[1][a]<2)&&(pd[10][a]<2)&&(pd[35][a]<2)&&(pd[44][a]<2)){
                cs1=nm[44]+nm[48]+nm[60]+a; cs2=nm[47]+nm[48]+nm[63]+a;
                cs3=nm[59]+nm[60]+nm[63]+a;
                if((cs1==LSM)&&(cs2==LSM)&&(cs3==LSM)){nm[64]=a;
                    df[16][a]++; df[32][a]++; df[48][a]++;
                    pd[1][a]++; pd[10][a]++; pd[35][a]++; pd[44][a]++;
                    recordans();
                    df[16][a]--; df[32][a]--; df[48][a]--;
                    pd[1][a]--; pd[10][a]--; pd[35][a]--; pd[44][a]--;
                }}}
    }
}
/**/
/* Record the Answer */

```

```

void recordans(){
    short n;
    cnt++;
    tlu[cnt-1][0]=cnt;
    for(n=1; n<65; n++){tlu[cnt-1][n]=nm[n]; }
}
/**/
/* Print the Layer Units */
void prc4lu(){
    short m, n, t, l;
    printf("\n [Layer Units]");
    for(m=0; m<cnt; m=m+3){
        anm[0]=m+1; bnm[0]=m+2; cnm[0]=m+3;
        for(n=1; n<65; n++){
            anm[n]=tlu[m][n]; bnm[n]=tlu[m+1][n]; cnm[n]=tlu[m+2][n];
        }
        pr3lu();
    }
    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;
        }
    }
    printf("\n [Reference Table of Matching Digits]");
    printf("\n *|");
    for(n=0; n<cnt; n++){printf("%3d", n+1); }
    printf("\n ---+-----");
    for(m=0; m<cnt; m++){
        printf("\n%3d|", m+1);
        for(n=0; n<cnt; n++){
            t=mtc[m][n];
            printf("%3d", t);
        }
    }
    printf("\n");
}
/**/
/* Print 3 Froms */
void pr3lu(){
    short l, m, ms, n, n16, d;
    printf("\n%17d/%21d/%21d\n", anm[0], bnm[0], cnm[0]);
    for(l=0; l<16; l=l+4){
        for(m=0; m<4; m++){
            for(ms=m; ms>=0; ms--){printf(" "); }
            for(n=0; n<4; n++){n16=n*16;
                printf("%2d ", anm[l+m+n16+1]);
            }
            printf(" ");
            for(n=0; n<4; n++){n16=n*16;
                printf("%2d ", bnm[l+m+n16+1]);
            }
            printf(" ");
            for(n=0; n<4; n++){n16=n*16; d=cnm[l+m+n16+1];
                if(n<3){printf("%2d ", d); }
                else{printf("%2d\n", d); }
            }
        }
    }
}
/**/
/* Combine abd Compose */
void cmbcomp(){
    short n, d, fc;

```



```

printf("%12d-----%2d-----%2d-----%2d\n", bnm[1], bnm[17], bnm[33], bnm[49]);
printf("    |%2d %9d %9d    |%2d",
    anm[2], anm[18], anm[34], anm[50]);
printf("    |%2d %9d %9d    |%2d\n",
    bnm[2], bnm[18], bnm[34], bnm[50]);
printf("%4d %3d %5d %3d %5d %3d %5d %3d",
    anm[5], anm[3], anm[21], anm[19], anm[37], anm[35], anm[53], anm[51]);
printf("%8d %3d %5d %3d %5d %3d %5d %3d\n",
    bnm[5], bnm[3], bnm[21], bnm[19], bnm[37], bnm[35], bnm[53], bnm[51]);
printf("    |%2d %2d---%2d--%2d---%2d--%2d---%2d--%2d",
    anm[6], anm[4], anm[22], anm[20], anm[38], anm[36], anm[54], anm[52]);
printf("    |%2d %2d---%2d--%2d---%2d--%2d---%2d--%2d\n",
    bnm[6], bnm[4], bnm[22], bnm[20], bnm[38], bnm[36], bnm[54], bnm[52]);
printf("%4d %3d |%4d %3d %5d %3d %5d %3d |",
    anm[9], anm[7], anm[25], anm[23], anm[41], anm[39], anm[57], anm[55]);
printf("%6d %3d |%4d %3d %5d %3d %5d %3d |\n",
    bnm[9], bnm[7], bnm[25], bnm[23], bnm[41], bnm[39], bnm[57], bnm[55]);
printf("    |%2d %3d %5d %3d %5d %3d    |%2d %3d",
    anm[10], anm[8], anm[26], anm[24], anm[42], anm[40], anm[58], anm[56]);
printf("    |%2d %3d %5d %3d %5d %3d    |%2d %3d\n",
    bnm[10], bnm[8], bnm[26], bnm[24], bnm[42], bnm[40], bnm[58], bnm[56]);
printf("%4d--%2d-|--%2d--%2d---%2d--%2d---%2d %3d |",
    anm[13], anm[11], anm[29], anm[27], anm[45], anm[43], anm[61], anm[59]);
printf("%6d--%2d-|--%2d--%2d---%2d--%2d---%2d %3d |\n",
    bnm[13], bnm[11], bnm[29], bnm[27], bnm[45], bnm[43], bnm[61], bnm[59]);
printf("%6d %3d %5d %3d %5d %3d %5d %3d",
    anm[14], anm[12], anm[30], anm[28], anm[46], anm[44], anm[62], anm[60]);
printf("    %4d %3d %5d %3d %5d %3d %5d %3d\n",
    bnm[14], bnm[12], bnm[30], bnm[28], bnm[46], bnm[44], bnm[62], bnm[60]);
printf("%8d |%8d %9d %9d |",
    anm[15], anm[31], anm[47], anm[63]);
printf("%10d |%8d %9d %9d |\n",
    bnm[15], bnm[31], bnm[47], bnm[63]);
printf("%10d-----%2d-----%2d-----%2d",
    anm[16], anm[32], anm[48], anm[64]);
printf("%12d-----%2d-----%2d-----%2d\n",
    bnm[16], bnm[32], bnm[48], bnm[64]);
}
/**/
/* Print The Answers */
void pr1ans(){
printf("\n%6d/%3d/%3d/%3d/%3d/%3d/%6d#\n",
    bnm[65], bnm[66], bnm[67], bnm[68], bnm[69], bnm[70], cntr[1]);
printf("%4d-----%2d-----%2d-----%2d\n", bnm[1], bnm[17], bnm[33], bnm[49]);
printf("    |%2d %9d %9d    |%2d\n",
    bnm[2], bnm[18], bnm[34], bnm[50]);
printf("%4d %3d %5d %3d %5d %3d %5d %3d\n",
    bnm[5], bnm[3], bnm[21], bnm[19], bnm[37], bnm[35], bnm[53], bnm[51]);
printf("    |%2d %2d---%2d--%2d---%2d--%2d---%2d--%2d\n",
    bnm[6], bnm[4], bnm[22], bnm[20], bnm[38], bnm[36], bnm[54], bnm[52]);
printf("%4d %3d |%4d %3d %5d %3d %5d %3d |\n",
    bnm[9], bnm[7], bnm[25], bnm[23], bnm[41], bnm[39], bnm[57], bnm[55]);
printf("    |%2d %3d %5d %3d %5d %3d    |%2d %3d\n",
    bnm[10], bnm[8], bnm[26], bnm[24], bnm[42], bnm[40], bnm[58], bnm[56]);
printf("%4d--%2d-|--%2d--%2d---%2d--%2d---%2d %3d |\n",
    bnm[13], bnm[11], bnm[29], bnm[27], bnm[45], bnm[43], bnm[61], bnm[59]);
printf("%6d %3d %5d %3d %5d %3d %5d %3d\n",
    bnm[14], bnm[12], bnm[30], bnm[28], bnm[46], bnm[44], bnm[62], bnm[60]);
printf("%8d |%8d %9d %9d |\n",
    bnm[15], bnm[31], bnm[47], bnm[63]);
printf("%10d-----%2d-----%2d-----%2d\n",
    bnm[16], bnm[32], bnm[48], bnm[64]);
}
/**/

```

```

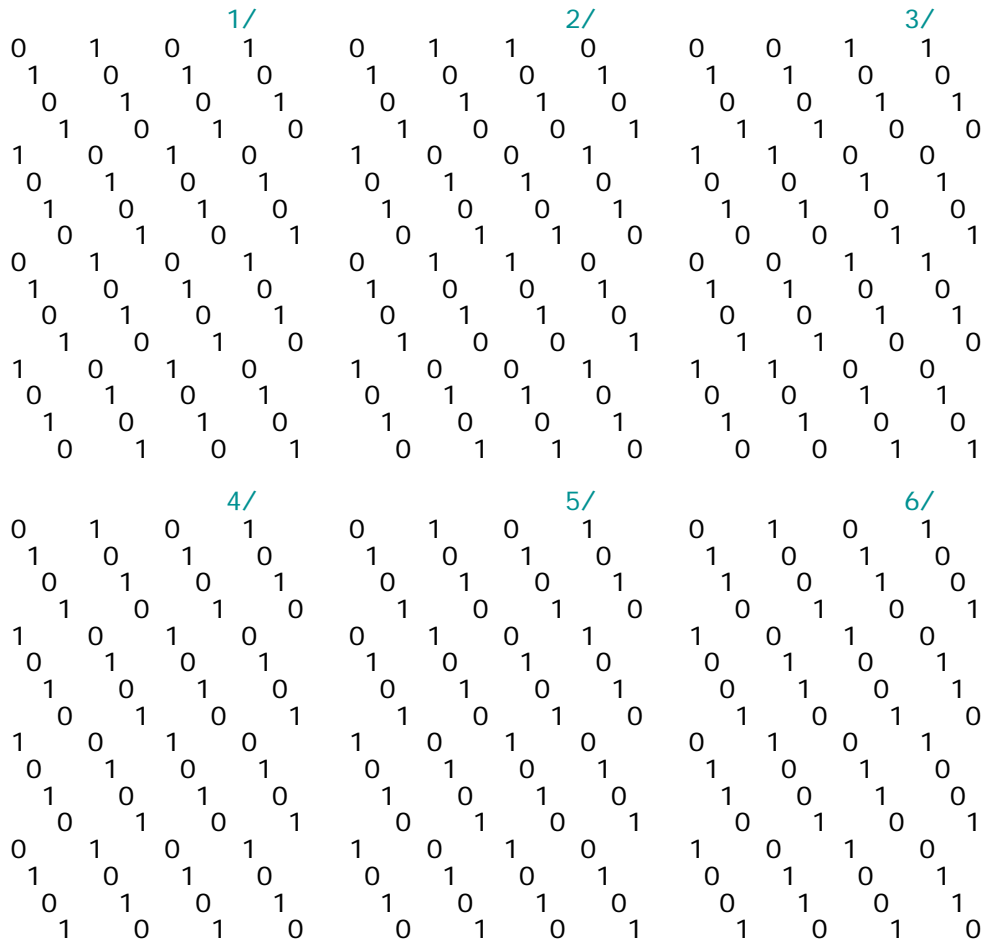
/* Print the Counts according to n1 */
void prcn1(){
short d,n;
for(n=1;n<41;n++){d=cn1[n];
if(d>0){printf("%4d:%3d,",n,d);}
else{printf("%4d: . . .",n);}
if(n%8==0){printf("\n");}
}
}
/**/
/* Print the Counts according to n43 */
void prcn43(){
short d,n;
for(n=1;n<65;n++){d=cn43[n];
if(d>0){printf("%4d:%3d,",n,d);}
else{printf("%4d: . . .",n);}
if(n%8==0){printf("\n");}
}
}
/**/

```

Let me show you here the result lists of my newest compositions of 'Composite and Pan-triagonal' Magic Cubes of order 4 by our "New Euler's Method" using binary number system.

** 'Complete Euler Type' of 'Composite & Pandiagonal' Magic Cubes **
 ** of Order 4 Composed by 'New Euler's Method' with Binary System **

[Layer Uni ts]



7/

```

0 1 0 1
0 1 0 1
1 1 0 1
1 0 0 1
0 0 1 0
0 1 0 1
1 0 0 1
1 0 0 1
0 1 0 1
0 1 0 1
1 0 0 1
1 0 0 1
0 1 0 1
0 1 0 1

```

8/

```

1 0 1 0
1 0 0 1
0 0 1 0
0 0 1 0
1 1 0 0
1 0 0 1
0 0 1 0
0 0 1 0
1 0 0 1
0 0 1 0
0 0 1 0
0 0 1 0
1 0 0 1
1 0 0 1

```

9/

```

1 0 1 0
0 0 1 0
0 1 0 1
0 1 0 1
1 0 0 1
1 0 0 1
0 1 0 1
0 1 0 1
1 0 0 1
0 1 0 1
0 1 0 1
0 1 0 1
1 0 0 1
1 0 0 1

```

10/

```

1 0 1 0
0 1 0 1
1 0 0 1
0 1 0 1
0 1 0 1
0 1 0 1
1 0 0 1
0 1 0 1
0 1 0 1
0 1 0 1
1 0 0 1
1 0 0 1
0 1 0 1
0 1 0 1

```

11/

```

1 0 1 0
0 1 0 1
0 1 0 1
0 1 0 1
0 1 0 1
0 1 0 1
1 0 0 1
1 0 0 1
1 0 0 1
1 0 0 1
0 1 0 1
0 1 0 1
0 1 0 1
0 1 0 1

```

12/

```

1 1 0 0
0 1 0 1
0 0 1 0
1 0 0 1
0 1 0 1
0 1 0 1
1 0 0 1
1 0 0 1
0 1 0 1
0 1 0 1
0 1 0 1
0 1 0 1
1 0 0 1
1 0 0 1

```

13/

```

1 0 0 1
0 1 0 1
0 1 0 1
0 1 0 1
1 0 0 1
0 1 0 1
0 1 0 1
0 1 0 1
1 0 0 1
0 1 0 1
0 1 0 1
0 1 0 1
1 0 0 1
1 0 0 1

```

14/

```

1 0 1 0
0 1 0 1
0 1 0 1
0 1 0 1
1 0 0 1
1 0 0 1
0 1 0 1
0 1 0 1
0 1 0 1
0 1 0 1
1 0 0 1
1 0 0 1
0 1 0 1
0 1 0 1

```

[Count of Layer Units = 14]

*	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	64	32	32	32	32	32	32	32	32	32	32	32	32	0
2	32	64	32	32	32	32	32	32	32	32	32	32	32	0
3	32	32	64	32	32	32	32	32	32	32	32	32	0	32
4	32	32	32	64	32	32	32	32	32	32	32	0	32	32
5	32	32	32	32	64	32	32	32	32	32	32	0	32	32
6	32	32	32	32	32	64	32	32	32	32	32	0	32	32
7	32	32	32	32	32	32	64	32	32	32	32	32	0	32
8	32	32	32	32	32	32	32	64	32	32	32	32	32	0
9	32	32	32	32	32	32	32	32	64	32	32	32	32	0
10	32	32	32	32	32	32	32	32	32	64	32	32	32	0
11	32	32	32	32	32	32	32	32	32	32	64	32	32	0
12	32	32	32	32	32	32	32	32	32	32	32	64	32	0
13	32	32	32	32	32	32	32	32	32	32	32	32	64	0
14	0	32	32	32	32	32	32	32	32	32	32	32	32	64

[Reference Table of Matching Digits]

**** Compositions of 'C & P' MC444: (Part) ****

Numbers of Used Units/// Solution Count#

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

1/	5/	2/	3/	4/	6/	561#								
1	-----	60	-----	13	-----	56								
64		5		52		9								
48	2	21	59	36	14	25 55								
17	63	-----	44	-----	6	-----	29	-----	51	-----	40	-----	10	
19	47		42	22	31	35	38	26						
46	18	23	43	34	30	27	39							
62	-----	20	-----	7	-----	41	-----	50	-----	32	-----	11	37	
3	45	58	24	15	33	54	28							
61		8		49		12								
4	-----	57	-----	16	-----	53								

1/	8/	2/	3/	4/	5/	721#								
17	-----	44	-----	29	-----	40								
64		5		52		9								
47	1	22	60	35	13	26 56								
2	48	-----	59	-----	21	-----	14	-----	36	-----	55	-----	25	
20	63		41	6	32	51	37	10						
61	18	8	43	49	30	12	39							
46	-----	4	-----	23	-----	57	-----	34	-----	16	-----	27	53	
3	45	58	24	15	33	54	28							
62		7		50		11								
19	-----	42	-----	31	-----	38								

1/	12/	2/	4/	5/	6/	881#								
17	-----	64	-----	9	-----	40								
48		1		56		25								
46	18	3	63	54	10	27 39								
19	47	-----	62	-----	2	-----	11	-----	55	-----	38	-----	26	
23	45		58	4	15	53	34	28						
42	20	7	61	50	12	31	37							
44	-----	24	-----	5	-----	57	-----	52	-----	16	-----	29	33	
21	41	60	8	13	49	36	32							
43		6		51		30								
22	-----	59	-----	14	-----	35								

Numbers of Used Units/// Solution Count#

1/	3/	2/	4/	5/	6/	481#								
1	-----	48	-----	25	-----	56								
64		17		40		9								
62	2	19	47	38	26	11 55								
3	63	-----	46	-----	18	-----	27	-----	39	-----	54	-----	10	
7	61		42	20	31	37	50	12						
58	4	23	45	34	28	15	53							
60	-----	8	-----	21	-----	41	-----	36	-----	32	-----	13	49	
5	57	44	24	29	33	52	16							
59		22		35		14								
6	-----	43	-----	30	-----	51								

1/	7/	2/	3/	4/	5/	641#								
1	-----	60	-----	13	-----	56								
48		21		36		25								
63	17	6	44	51	29	10 40								
18	64	-----	43	-----	5	-----	30	-----	52	-----	39	-----	9	
4	47		57	22	16	35	53	26						
45	2	24	59	33	14	28	55							
62	-----	20	-----	7	-----	41	-----	50	-----	32	-----	11	37	
19	61	42	8	31	49	38	12							
46		23		34		27								
3	-----	58	-----	15	-----	54								

1/	10/	2/	3/	4/	6/	801#								
17	-----	44	-----	29	-----	40								
48		21		36		25								
64	18	5	43	52	30	9 39								
1	47	-----	60	-----	22	-----	13	-----	35	-----	56	-----	26	
3	63		58	6	15	51	54	10						
62	2	7	59	50	14	11	55							
46	-----	4	-----	23	-----	57	-----	34	-----	16	-----	27	53	
19	61	42	8	31	49	38	12							
45		24		33		28								
20	-----	41	-----	32	-----	37								

2/	1/	3/	4/	5/	6/	961#								
1	-----	56	-----	41	-----	32								
64		9		24		33								
62	2	11	55	22	42	35 31								
3	63	-----	54	-----	10	-----	43	-----	23	-----	30	-----	34	
7	61		50	12	47	21	26	36						
58	4	15	53	18	44	39	29							
60	-----	8	-----	13	-----	49	-----	20	-----	48	-----	37	25	
5	57	52	16	45	17	28	40							
59		14		19		38								
6	-----	51	-----	46	-----	27								

2/ 3/ 1/ 4/ 5/ 6/ 1441#
 1-----48-----49-----32
 |64 17 16 |33
 62 2 19 47 14 50 35 31
 | 3 63---46---18---51---15---30---34
 7 61 | 42 20 55 13 26 36 |
 |58 4 23 45 10 52 |39 29
 60-- 8-|--21--41---12--56---37 25 |
 5 57 44 24 53 9 28 40
 59 | 22 11 38 |
 6-----43-----54-----27

2/ 4/ 1/ 3/ 5/ 6/ 1921#
 1-----60-----37-----32
 |64 5 28 |33
 62 2 7 59 26 38 35 31
 | 3 63---58---6---39---27---30---34
 19 61 | 42 8 55 25 14 36 |
 |46 4 23 57 10 40 |51 29
 48--20-|--21--41---12--56---49 13 |
 17 45 44 24 53 9 16 52
 47 | 22 11 50 |
 18-----43-----54-----15

2/ 5/ 1/ 3/ 4/ 6/ 2881#
 1-----60-----37-----32
 |64 5 28 |33
 48 2 21 59 12 38 49 31
 |17 63---44---6---53---27---16---34
 19 47 | 42 22 55 11 14 50 |
 |46 18 23 43 10 54 |51 15
 62--20-|--7--41---26--56---35 13 |
 3 45 58 24 39 9 30 52
 61 | 8 25 36 |
 4-----57-----40-----29

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

3/ 1/ 2/ 4/ 5/ 6/ 3841#
 1-----32-----41-----56
 |64 33 24 | 9
 62 2 35 31 22 42 11 55
 | 3 63---30---34---43---23---54---10
 7 61 | 26 36 47 21 50 12 |
 |58 4 39 29 18 44 |15 53
 60-- 8-|--37--25---20--48---13 49 |
 5 57 28 40 45 17 52 16
 59 | 38 19 14 |
 6-----27-----46-----51

5/ 1/ 2/ 3/ 4/ 6/ 4801#
 1-----60-----13-----56
 |64 5 52 | 9
 32 2 37 59 20 14 41 55
 |33 63---28---6---45---51---24---10
 35 31 | 26 38 47 19 22 42 |
 |30 34 39 27 18 46 |43 23
 62--36-|--7--25---50--48---11 21 |
 3 29 58 40 15 17 54 44
 61 | 8 49 12 |
 4-----57-----16-----53

7/ 1/ 2/ 3/ 4/ 5/ 5761#
 1-----60-----13-----56
 |32 37 20 |41
 63 33 6 28 51 45 10 24
 |34 64---27---5---46---52---23---9
 4 31 | 57 38 16 19 53 42 |
 |29 2 40 59 17 14 |44 55
 62--36-|--7--25---50--48---11 21 |
 35 61 26 8 47 49 22 12
 30 | 39 18 43 |
 3-----58-----15-----54

[Count of Compositions = 6720]

[Counts according to n1]

1: 840, 2: 720, 3: 624, 4: 528, 5: 528, 6: 432, 7: 360, 8: 288,
 9: 408, 10: 312, 11: 240, 12: 168, 13: 168, 14: 96, 15: 48, 16: ...,
 17: 240, 18: 168, 19: 120, 20: 72, 21: 96, 22: 48, 23: 24, 24: ...,
 25: 96, 26: 48, 27: 24, 28: ..., 29: 24, 30: ..., 31: ..., 32: ...,
 33: ..., 34: ..., 35: ..., 36: ..., 37: ..., 38: ..., 39: ..., 40: ...

[Counts according to n43]

1: ..., 2: ..., 3: ..., 4: 6, 5: ..., 6: 6, 7: 12, 8: 24,
 9: ..., 10: 6, 11: 12, 12: 24, 13: 18, 14: 30, 15: 42, 16: 60,
 17: ..., 18: 6, 19: 12, 20: 24, 21: 18, 22: 30, 23: 42, 24: 60,
 25: 24, 26: 36, 27: 48, 28: 66, 29: 60, 30: 78, 31: 96, 32: 120,
 33: ..., 34: 6, 35: 12, 36: 36, 37: 18, 38: 42, 39: 66, 40: 108,
 41: 24, 42: 48, 43: 72, 44: 114, 45: 96, 46: 138, 47: 180, 48: 240,
 49: 30, 50: 66, 51: 102, 52: 156, 53: 150, 54: 204, 55: 258, 56: 330,
 57: 222, 58: 276, 59: 330, 60: 402, 61: 396, 62: 468, 63: 540, 64: 630,

OK!

Could we find those 15x7 Fundamental Solutions among them above?

Yes. You could find them if you put these new list-forming conditions in place of the standard inequality conditions above.

```
/**/
    i f(fc==64){
        i f((nm[1]==1)&&(nm[49]<nm[13])&&(nm[13]<nm[4])){
            i f((nm[2]>nm[4])&&(nm[5]>nm[13])&&(nm[17]>nm[49])){
                pransc4();
            }}
/**/
```

The next list shows you the 15x7 Fundamental Solutions. Of course, it includes those Fundamental 15 solutions of previous 'Composite & Complete' MC444.

**** Fundamental Solutions of 'C & P' Magic Cubes 4x4x4: (Part) ****

Numbers of Used Units/// n43-Count#	Numbers of Used Units/// n43-Count#
<p>1/ 2/ 3/ 4/ 5/ 6/ 32- 1#</p> <pre>1-----56-----25-----48 64 9 40 17 62 2 11 55 38 26 19 47 3 63---54--10---27--39---46--18 7 61 50 12 31 37 42 20 58 4 15 53 34 28 23 45 60-- 8- --13--49---36--32---21 41 5 57 52 16 29 33 44 24 59 14 35 22 6-----51-----30-----43</pre>	<p>1/ 2/ 3/ 4/ 6/ 5/ 32- 2#</p> <pre>1-----56-----25-----48 64 9 40 17 63 3 10 54 39 27 18 46 2 62---55--11---26--38---47--19 6 61 51 12 30 37 43 20 59 4 14 53 35 28 22 45 60-- 8- --13--49---36--32---21 41 5 57 52 16 29 33 44 24 58 15 34 23 7-----50-----31-----42</pre>
<p>1/ 2/ 3/ 4/ 6/ 7/ 32- 3#</p> <pre>1-----56-----25-----48 63 10 39 18 64 4 9 53 40 28 17 45 2 62---55--11---26--38---47--19 5 61 52 12 29 37 44 20 59 3 14 54 35 27 22 46 60-- 8- --13--49---36--32---21 41 6 58 51 15 30 34 43 23 57 16 33 24 7-----50-----31-----42</pre>	<p>1/ 2/ 4/ 3/ 5/ 6/ 32- 4#</p> <pre>1-----60-----21-----48 64 5 44 17 62 2 7 59 42 22 19 47 3 63---58-- 6---23--43---46--18 11 61 50 8 31 41 38 20 54 4 15 57 34 24 27 45 56--12- --13--49---36--32---25 37 9 53 52 16 29 33 40 28 55 14 35 26 10-----51-----30-----39</pre>

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

[Count of Compositions = 15 x 7]

[Counts according to n1]

1: 105, 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: ...,
 33: ..., 34: ..., 35: ..., 36: ..., 37: ..., 38: ..., 39: ..., 40: ...,

[Counts according to n43]

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: 15,
 33: ..., 34: ..., 35: ..., 36: ..., 37: ..., 38: ..., 39: ..., 40: ...,
 41: ..., 42: ..., 43: ..., 44: ..., 45: ..., 46: ..., 47: ..., 48: 15,
 49: ..., 50: ..., 51: ..., 52: ..., 53: ..., 54: ..., 55: ..., 56: 15,
 57: ..., 58: ..., 59: ..., 60: 15, 61: ..., 62: 15, 63: 15, 64: 15 OK!

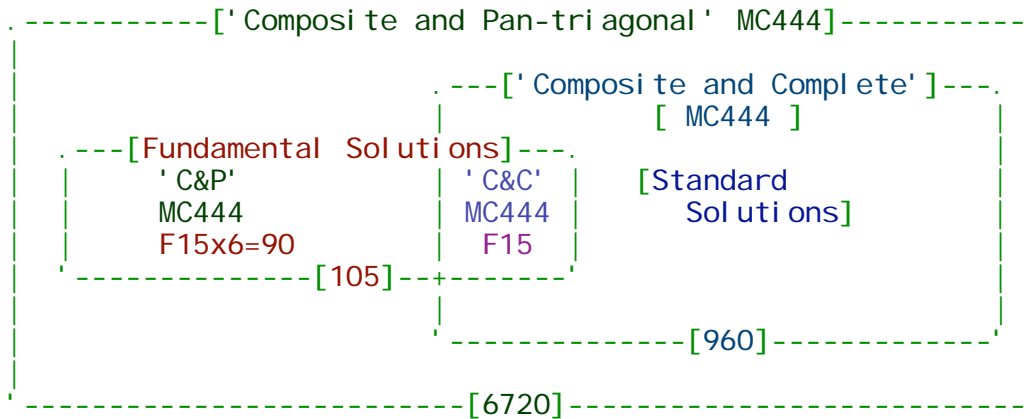
The last 15 solutions with n43=64 in our list are nothing but the Fundamental 15 of 'Composite and Complete' MC444.

Every old member has come to see me again! It makes me happy.

Our 'New Euler's Method' proves to be so powerful to reconstruct everything.

I should say, this means everything has the beautiful structure in common, what we call 'Complete Euler Cubes' of order 4.

**** Diagram showing 4 Types of Solution Sets ****



The set-diagram above shows the relations among various solution sets of 'C & P' MC444.

(Original written by Kanji Setsuda on Sep. 22, 2003;
 Revised by Kanji Setsuda on Mac OSX & Xcode 1.5; Sep. 22, 2005)

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