

## Part 4. "New Advanced Study of Magic Squares and Cubes"

### Chapter 7. New Method of Composing High-Dimensional Extra-Cubic Objects and their Developed Forms: **Kanji Setsuda**

### Section 3. Composition of Six-Dimensional Extra-Cubic Objects of Order 2 and their Developed Forms

#### #1. Our Purpose

Let's compose ECO<sub>2</sub><sup>6</sup> again. We want to design it more strictly than before, and know how many primitive solutions it has in its 'Mother Set'.

Now that we can draw many pictures of the same ECO, let's use these pictures for the Basic Diagrams of our object.

First of all we have to know how many simultaneous equations are really necessary for our first definition.

#### #2. How do you define ECO<sub>2</sub><sup>6</sup>?

We now guess we can draw so many different pictures as 720 for our object by the 6-time loops of for( ... ){ ... } sentences and with a little change in the order of variables {d<sub>0</sub>, d<sub>1</sub>, d<sub>2</sub>, d<sub>3</sub>, d<sub>4</sub>, d<sub>5</sub>}. Because  ${}_6P_6 = 6 \times 5 \times 4 \times 3 \times 2 \times 1 = 720$ .

But 720 are too many for us to deal with. As you know each of 720 pictures has 8 little cubes of order 2<sup>3</sup> in it, and each cube must have 6 equations. We will have to take 720x8x6 = 34560 equations in all. What a horror!

We just want to put those equations all to every little cube of order 2 in order that every 4 numbers on each surface of those little ones must add up to the magic C(onstant=130). But we don't want to have so many equations as 34560.

Can you cut any pictures or any equations?

Of course there are many duplications of various types. If you remove every simple reflection or rotation of a representative pattern, you will have only 120 pictures, a sixth of 720. If you can find another type of duplications, you may remove them and have got only 20 essential view-forms at last.

1/d <sub>0</sub>	/d <sub>1</sub>	/d <sub>2</sub>	/d <sub>3</sub>	/d <sub>4</sub>	/d <sub>5</sub>	...
1--- 2	9---10	17---18	25---26	33---34	41---42	...
3-- 4	11--12	19--20	27--28	35--36	43--44	
5--  6	13-- 14	21-- 22	29-- 30	37-- 38	45-- 46	
7--- 8	15---16	23---24	31---32	39---40	47---48	

n <sub>1</sub> +n <sub>2</sub> +n <sub>3</sub> +n <sub>4</sub> =C	n <sub>9</sub> +n <sub>10</sub> +n <sub>11</sub> +n <sub>12</sub> =C	n <sub>17</sub> +n <sub>18</sub> +n <sub>19</sub> +n <sub>20</sub> =C	n <sub>25</sub> +n <sub>26</sub> +n <sub>27</sub> +n <sub>28</sub> =C
n <sub>1</sub> +n <sub>2</sub> +n <sub>5</sub> +n <sub>6</sub> =C	n <sub>9</sub> +n <sub>10</sub> +n <sub>13</sub> +n <sub>14</sub> =C	n <sub>17</sub> +n <sub>18</sub> +n <sub>21</sub> +n <sub>22</sub> =C	n <sub>25</sub> +n <sub>26</sub> +n <sub>29</sub> +n <sub>30</sub> =C
n <sub>1</sub> +n <sub>3</sub> +n <sub>5</sub> +n <sub>7</sub> =C	n <sub>9</sub> +n <sub>11</sub> +n <sub>13</sub> +n <sub>15</sub> =C	n <sub>17</sub> +n <sub>19</sub> +n <sub>21</sub> +n <sub>23</sub> =C	n <sub>25</sub> +n <sub>27</sub> +n <sub>29</sub> +n <sub>31</sub> =C
n <sub>2</sub> +n <sub>4</sub> +n <sub>6</sub> +n <sub>8</sub> =C	n <sub>10</sub> +n <sub>12</sub> +n <sub>14</sub> +n <sub>16</sub> =C	n <sub>18</sub> +n <sub>20</sub> +n <sub>22</sub> +n <sub>24</sub> =C	n <sub>26</sub> +n <sub>28</sub> +n <sub>30</sub> +n <sub>32</sub> =C
n <sub>3</sub> +n <sub>4</sub> +n <sub>7</sub> +n <sub>8</sub> =C	n <sub>11</sub> +n <sub>12</sub> +n <sub>15</sub> +n <sub>16</sub> =C	n <sub>19</sub> +n <sub>20</sub> +n <sub>23</sub> +n <sub>24</sub> =C	n <sub>27</sub> +n <sub>28</sub> +n <sub>31</sub> +n <sub>32</sub> =C
n <sub>5</sub> +n <sub>6</sub> +n <sub>7</sub> +n <sub>8</sub> =C	n <sub>13</sub> +n <sub>14</sub> +n <sub>15</sub> +n <sub>16</sub> =C	n <sub>21</sub> +n <sub>22</sub> +n <sub>23</sub> +n <sub>24</sub> =C	n <sub>29</sub> +n <sub>30</sub> +n <sub>31</sub> +n <sub>32</sub> =C

2/d <sub>0</sub>	/d <sub>1</sub>	/d <sub>2</sub>	/d <sub>3</sub>	/d <sub>4</sub>	/d <sub>5</sub>	...
1--- 2	5--- 6	17---18	21---22	33---34	37---38	...
3-- 4	7-- 8	19--20	23--24	35--36	39--40	
9-- 10	13-- 14	25-- 26	29-- 30	41-- 42	45-- 46	
11---12	15---16	27---28	31---32	43---44	47---48	

n <sub>1</sub> +n <sub>2</sub> +n <sub>3</sub> +n <sub>4</sub> =C	n <sub>5</sub> +n <sub>6</sub> +n <sub>7</sub> +n <sub>8</sub> =C	n <sub>17</sub> +n <sub>18</sub> +n <sub>19</sub> +n <sub>20</sub> =C	n <sub>21</sub> +n <sub>22</sub> +n <sub>23</sub> +n <sub>24</sub> =C
n <sub>1</sub> +n <sub>2</sub> +n <sub>9</sub> +n <sub>10</sub> =C	n <sub>5</sub> +n <sub>6</sub> +n <sub>13</sub> +n <sub>14</sub> =C	n <sub>17</sub> +n <sub>18</sub> +n <sub>25</sub> +n <sub>26</sub> =C	n <sub>21</sub> +n <sub>22</sub> +n <sub>29</sub> +n <sub>30</sub> =C
n <sub>1</sub> +n <sub>3</sub> +n <sub>9</sub> +n <sub>11</sub> =C	n <sub>5</sub> +n <sub>7</sub> +n <sub>13</sub> +n <sub>15</sub> =C	n <sub>17</sub> +n <sub>19</sub> +n <sub>25</sub> +n <sub>27</sub> =C	n <sub>21</sub> +n <sub>23</sub> +n <sub>29</sub> +n <sub>31</sub> =C
n <sub>2</sub> +n <sub>4</sub> +n <sub>10</sub> +n <sub>12</sub> =C	n <sub>6</sub> +n <sub>8</sub> +n <sub>14</sub> +n <sub>16</sub> =C	n <sub>18</sub> +n <sub>20</sub> +n <sub>26</sub> +n <sub>28</sub> =C	n <sub>22</sub> +n <sub>24</sub> +n <sub>30</sub> +n <sub>32</sub> =C
n <sub>3</sub> +n <sub>4</sub> +n <sub>11</sub> +n <sub>12</sub> =C	n <sub>7</sub> +n <sub>8</sub> +n <sub>15</sub> +n <sub>16</sub> =C	n <sub>19</sub> +n <sub>20</sub> +n <sub>27</sub> +n <sub>28</sub> =C	n <sub>23</sub> +n <sub>24</sub> +n <sub>31</sub> +n <sub>32</sub> =C
n <sub>9</sub> +n <sub>10</sub> +n <sub>11</sub> +n <sub>12</sub> =C	n <sub>13</sub> +n <sub>14</sub> +n <sub>15</sub> +n <sub>16</sub> =C	n <sub>25</sub> +n <sub>26</sub> +n <sub>27</sub> +n <sub>28</sub> =C	n <sub>29</sub> +n <sub>30</sub> +n <sub>31</sub> +n <sub>32</sub> =C

3/d0	/d1	/d2	/d3	/d4	/d5
1--- 2	3--- 4	17---18	19---20	33---34	35---36 ...
5-+- 6	7-+- 8	21-+-22	23-+-24	37-+-38	39-+-40
9-- 10	11-- 12	25-- 26	27-- 28	41-- 42	43-- 44
13---14	15---16	29---30	31---32	45---46	47---48

$n1+n2+n5+n6=C$	$n3+n4+n7+n8=C$	$n17+n18+n21+n22=C$	$n19+n20+n23+n24=C$
$n1+n2+n9+n10=C$	$n3+n4+n11+n12=C$	$n17+n18+n25+n26=C$	$n19+n20+n27+n28=C$
$n1+n5+n9+n13=C$	$n3+n7+n11+n15=C$	$n17+n21+n25+n29=C$	$n19+n23+n27+n31=C$
$n2+n6+n10+n14=C$	$n4+n8+n12+n16=C$	$n18+n22+n26+n30=C$	$n20+n24+n28+n32=C$
$n5+n6+n13+n14=C$	$n7+n8+n15+n16=C$	$n21+n22+n29+n30=C$	$n23+n24+n31+n32=C$
$n9+n10+n13+n14=C$	$n11+n12+n15+n16=C$	$n25+n26+n29+n30=C$	$n27+n28+n31+n32=C$

4/d0	/d1	/d2	/d3	/d4	/d5
1--- 3	2--- 4	17---19	18---20	33---35	34---36 ...
5-+- 7	6-+- 8	21-+-23	22-+-24	37-+-39	38-+-40
9-- 11	10-- 12	25-- 27	26-- 28	41-- 43	42-- 44
13---15	14---16	29---31	30---32	45---47	46---48

$n1+n3+n5+n7=C$	$n2+n4+n6+n8=C$	$n17+n19+n21+n23=C$	$n18+n20+n22+n24=C$
$n1+n3+n9+n11=C$	$n2+n4+n10+n12=C$	$n17+n19+n25+n27=C$	$n18+n20+n26+n28=C$
$n1+n5+n9+n13=C$	$n2+n6+n10+n14=C$	$n17+n21+n25+n29=C$	$n18+n22+n26+n30=C$
$n3+n7+n11+n15=C$	$n4+n8+n12+n16=C$	$n19+n23+n27+n31=C$	$n20+n24+n28+n32=C$
$n5+n7+n13+n15=C$	$n6+n8+n14+n16=C$	$n21+n23+n29+n31=C$	$n22+n24+n30+n32=C$
$n9+n11+n13+n15=C$	$n10+n12+n14+n16=C$	$n25+n27+n29+n31=C$	$n26+n28+n30+n32=C$

5/d0	/d1	/d2	/d3	/d4	/d5
1--- 2	5--- 6	9---10	13---14	33---34	37---38 ...
3-+- 4	7-+- 8	11-+-12	15-+-16	35-+-36	39-+-40
17-- 18	21-- 22	25-- 26	29-- 30	49-- 50	53-- 54
19---20	23---24	27---28	31---32	51---52	55---56

$n1+n2+n3+n4=C$	$n5+n6+n7+n8=C$	$n9+n10+n11+n12=C$	$n13+n14+n15+n16=C$
$n1+n2+n17+n18=C$	$n5+n6+n21+n22=C$	$n9+n10+n25+n26=C$	$n13+n14+n29+n30=C$
$n1+n3+n17+n19=C$	$n5+n7+n21+n23=C$	$n9+n11+n25+n27=C$	$n13+n15+n29+n31=C$
$n2+n4+n18+n20=C$	$n6+n8+n22+n24=C$	$n10+n12+n26+n28=C$	$n14+n16+n30+n32=C$
$n3+n4+n19+n20=C$	$n7+n8+n23+n24=C$	$n11+n12+n27+n28=C$	$n15+n16+n31+n32=C$
$n17+n18+n19+n20=C$	$n21+n22+n23+n24=C$	$n25+n26+n27+n28=C$	$n29+n30+n31+n32=C$

6/d0	/d1	/d2	/d3	/d4	/d5
1--- 2	3--- 4	9---10	11---12	33---34	35---36 ...
5-+- 6	7-+- 8	13-+-14	15-+-16	37-+-38	39-+-40
17-- 18	19-- 20	25-- 26	27-- 28	49-- 50	51-- 52
21---22	23---24	29---30	31---32	53---54	55---56

$n1+n2+n5+n6=C$	$n3+n4+n7+n8=C$	$n9+n10+n13+n14=C$	$n11+n12+n15+n16=C$
$n1+n2+n17+n18=C$	$n3+n4+n19+n20=C$	$n9+n10+n25+n26=C$	$n11+n12+n27+n28=C$
$n1+n5+n17+n21=C$	$n3+n7+n19+n23=C$	$n9+n13+n25+n29=C$	$n11+n15+n27+n31=C$
$n2+n6+n18+n22=C$	$n4+n8+n20+n24=C$	$n10+n14+n26+n30=C$	$n12+n16+n28+n32=C$
$n5+n6+n21+n22=C$	$n7+n8+n23+n24=C$	$n13+n14+n29+n30=C$	$n15+n16+n31+n32=C$
$n17+n18+n21+n22=C$	$n19+n20+n23+n24=C$	$n25+n26+n29+n30=C$	$n27+n28+n31+n32=C$

7/d0	/d1	/d2	/d3	/d4	/d5
1--- 3	2--- 4	9---11	10---12	33---35	34---36 ...
5-+- 7	6-+- 8	13-+-15	14-+-16	37-+-39	38-+-40
17-- 19	18-- 20	25-- 27	26-- 28	49-- 51	50-- 52
21---23	22---24	29---31	30---32	53---55	54---56

$n1+n3+n5+n7=C$	$n2+n4+n6+n8=C$	$n9+n11+n13+n15=C$	$n10+n12+n14+n16=C$
$n1+n3+n17+n19=C$	$n2+n4+n18+n20=C$	$n9+n11+n25+n27=C$	$n10+n12+n26+n28=C$
$n1+n5+n17+n21=C$	$n2+n6+n18+n22=C$	$n9+n13+n25+n29=C$	$n10+n14+n26+n30=C$
$n3+n7+n19+n23=C$	$n4+n8+n20+n24=C$	$n11+n15+n27+n31=C$	$n12+n16+n28+n32=C$
$n5+n7+n21+n23=C$	$n6+n8+n22+n24=C$	$n13+n15+n29+n31=C$	$n14+n16+n30+n32=C$
$n17+n19+n21+n23=C$	$n18+n20+n22+n24=C$	$n25+n27+n29+n31=C$	$n26+n28+n30+n32=C$

8/d0	/d1	/d2	/d3	/d4	/d5	
1--- 2	3--- 4	5--- 6	7--- 8	33---34	35---36	...
9-+-10	11-+-12	13-+-14	15-+-16	41-+-42	43-+-44	
17-- 18	19-- 20	21-- 22	23-- 24	49-- 50	51-- 52	
25---26	27---28	29---30	31---32	57---58	59---60	

n1+n2+n9+n10=C	n3+n4+n11+n12=C	n5+n6+n13+n14=C	n7+n8+n15+n16=C
n1+n2+n17+n18=C	n3+n4+n19+n20=C	n5+n6+n21+n22=C	n7+n8+n23+n24=C
n1+n9+n17+n25=C	n3+n11+n19+n27=C	n5+n13+n21+n29=C	n7+n15+n23+n31=C
n2+n10+n18+n26=C	n4+n12+n20+n28=C	n6+n14+n22+n30=C	n8+n16+n24+n32=C
n9+n10+n25+n26=C	n11+n12+n27+n28=C	n13+n14+n29+n30=C	n15+n16+n31+n32=C
n17+n18+n25+n26=C	n19+n20+n27+n28=C	n21+n22+n29+n30=C	n23+n24+n31+n32=C

9/d0	/d1	/d2	/d3	/d4	/d5	
1--- 3	2--- 4	5--- 7	6--- 8	33---35	34---36	...
9-+-11	10-+-12	13-+-15	14-+-16	41-+-43	42-+-44	
17-- 19	18-- 20	21-- 23	22-- 24	49-- 51	50-- 52	
25---27	26---28	29---31	30---32	57---59	58---60	

n1+n3+n9+n11=C	n2+n4+n10+n12=C	n5+n7+n13+n15=C	n6+n8+n14+n16=C
n1+n3+n17+n19=C	n2+n4+n18+n20=C	n5+n7+n21+n23=C	n6+n8+n22+n24=C
n1+n9+n17+n25=C	n2+n10+n18+n26=C	n5+n13+n21+n29=C	n6+n14+n22+n30=C
n3+n11+n19+n27=C	n4+n12+n20+n28=C	n7+n15+n23+n31=C	n8+n16+n24+n32=C
n9+n11+n25+n27=C	n10+n12+n26+n28=C	n13+n15+n29+n31=C	n14+n16+n30+n32=C
n17+n19+n25+n27=C	n18+n20+n26+n28=C	n21+n23+n29+n31=C	n22+n24+n30+n32=C

10/d0	/d1	/d2	/d3	/d4	/d5	
1--- 5	2--- 6	3--- 7	4--- 8	33---37	34---38	...
9-+-13	10-+-14	11-+-15	12-+-16	41-+-45	42-+-46	
17-- 21	18-- 22	19-- 23	20-- 24	49-- 53	50-- 54	
25---29	26---30	27---31	28---32	57---61	58---62	

n1+n5+n9+n13=C	n2+n6+n10+n14=C	n3+n7+n11+n15=C	n4+n8+n12+n16=C
n1+n5+n17+n21=C	n2+n6+n18+n22=C	n3+n7+n19+n23=C	n4+n8+n20+n24=C
n1+n9+n17+n25=C	n2+n10+n18+n26=C	n3+n11+n19+n27=C	n4+n12+n20+n28=C
n5+n13+n21+n29=C	n6+n14+n22+n30=C	n7+n15+n23+n31=C	n8+n16+n24+n32=C
n9+n13+n25+n29=C	n10+n14+n26+n30=C	n11+n15+n27+n31=C	n12+n16+n28+n32=C
n17+n21+n25+n29=C	n18+n22+n26+n30=C	n19+n23+n27+n31=C	n20+n24+n28+n32=C

11/d0	/d1	/d2	/d3	/d4	/d5	
1--- 2	5--- 6	9---10	13---14	17---18	21---22	...
3-+- 4	7-+- 8	11-+-12	15-+-16	19-+-20	23-+-24	
33-- 34	37-- 38	41-- 42	45-- 46	49-- 50	53-- 54	
35---36	39---40	43---44	47---48	51---52	55---56	

n1+n2+n3+n4=C	n5+n6+n7+n8=C	n9+n10+n11+n12=C	n13+n14+n15+n16=C
n1+n2+n33+n34=C	n5+n6+n37+n38=C	n9+n10+n41+n42=C	n13+n14+n45+n46=C
n1+n3+n33+n35=C	n5+n7+n37+n39=C	n9+n11+n41+n43=C	n13+n15+n45+n47=C
n2+n4+n34+n36=C	n6+n8+n38+n40=C	n10+n12+n42+n44=C	n14+n16+n46+n48=C
n3+n4+n35+n36=C	n7+n8+n39+n40=C	n11+n12+n43+n44=C	n15+n16+n47+n48=C
n33+n34+n35+n36=C	n37+n38+n39+n40=C	n41+n42+n43+n44=C	n45+n46+n47+n48=C

12/d0	/d1	/d2	/d3	/d4	/d5	
1--- 2	3--- 4	9---10	11---12	17---18	19---20	...
5-+- 6	7-+- 8	13-+-14	15-+-16	21-+-22	23-+-24	
33-- 34	35-- 36	41-- 42	43-- 44	49-- 50	51-- 52	
37---38	39---40	45---46	47---48	53---54	55---56	

n1+n2+n5+n6=C	n3+n4+n7+n8=C	n9+n10+n13+n14=C	n11+n12+n15+n16=C
n1+n2+n33+n34=C	n3+n4+n35+n36=C	n9+n10+n41+n42=C	n11+n12+n43+n44=C
n1+n5+n33+n37=C	n3+n7+n35+n39=C	n9+n13+n41+n45=C	n11+n15+n43+n47=C
n2+n6+n34+n38=C	n4+n8+n36+n40=C	n10+n14+n42+n46=C	n12+n16+n44+n48=C
n5+n6+n37+n38=C	n7+n8+n39+n40=C	n13+n14+n45+n46=C	n15+n16+n47+n48=C
n33+n34+n37+n38=C	n35+n36+n39+n40=C	n41+n42+n45+n46=C	n43+n44+n47+n48=C

13/d0	/d1	/d2	/d3	/d4	/d5	
1--- 3	2--- 4	9---11	10---12	17---19	18---20	...
5-- 7	6-- 8	13--15	14--16	21--23	22--24	
33-- 35	34-- 36	41-- 43	42-- 44	49-- 51	50-- 52	
37---39	38---40	45---47	46---48	53---55	54---56	

$n1+n3+n5+n7=C$	$n2+n4+n6+n8=C$	$n9+n11+n13+n15=C$	$n10+n12+n14+n16=C$
$n1+n3+n33+n35=C$	$n2+n4+n34+n36=C$	$n9+n11+n41+n43=C$	$n10+n12+n42+n44=C$
$n1+n5+n33+n37=C$	$n2+n6+n34+n38=C$	$n9+n13+n41+n45=C$	$n10+n14+n42+n46=C$
$n3+n7+n35+n39=C$	$n4+n8+n36+n40=C$	$n11+n15+n43+n47=C$	$n12+n16+n44+n48=C$
$n5+n7+n37+n39=C$	$n6+n8+n38+n40=C$	$n13+n15+n45+n47=C$	$n14+n16+n46+n48=C$
$n33+n35+n37+n39=C$	$n34+n36+n38+n40=C$	$n41+n43+n45+n47=C$	$n42+n44+n46+n48=C$

14/d0	/d1	/d2	/d3	/d4	/d5	
1--- 2	3--- 4	5--- 6	7--- 8	17---18	19---20	...
9--10	11--12	13--14	15--16	25--26	27--28	
33-- 34	35-- 36	37-- 38	39-- 40	49-- 50	51-- 52	
41---42	43---44	45---46	47---48	57---58	59---60	

$n1+n2+n9+n10=C$	$n3+n4+n11+n12=C$	$n5+n6+n13+n14=C$	$n7+n8+n15+n16=C$
$n1+n2+n33+n34=C$	$n3+n4+n35+n36=C$	$n5+n6+n37+n38=C$	$n7+n8+n39+n40=C$
$n1+n9+n33+n41=C$	$n3+n11+n35+n43=C$	$n5+n13+n37+n45=C$	$n7+n15+n39+n47=C$
$n2+n10+n34+n42=C$	$n4+n12+n36+n44=C$	$n6+n14+n38+n46=C$	$n8+n16+n40+n48=C$
$n9+n10+n41+n42=C$	$n11+n12+n43+n44=C$	$n13+n14+n45+n46=C$	$n15+n16+n47+n48=C$
$n33+n34+n41+n42=C$	$n35+n36+n43+n44=C$	$n37+n38+n45+n46=C$	$n39+n40+n47+n48=C$

15/d0	/d1	/d2	/d3	/d4	/d5	
1--- 3	2--- 4	5--- 7	6--- 8	17---19	18---20	...
9--11	10--12	13--15	14--16	25--27	26--28	
33-- 35	34-- 36	37-- 39	38-- 40	49-- 51	50-- 52	
41---43	42---44	45---47	46---48	57---59	58---60	

$n1+n3+n9+n11=C$	$n2+n4+n10+n12=C$	$n5+n7+n13+n15=C$	$n6+n8+n14+n16=C$
$n1+n3+n33+n35=C$	$n2+n4+n34+n36=C$	$n5+n7+n37+n39=C$	$n6+n8+n38+n40=C$
$n1+n9+n33+n41=C$	$n2+n10+n34+n42=C$	$n5+n13+n37+n45=C$	$n6+n14+n38+n46=C$
$n3+n11+n35+n43=C$	$n4+n12+n36+n44=C$	$n7+n15+n39+n47=C$	$n8+n16+n40+n48=C$
$n9+n11+n41+n43=C$	$n10+n12+n42+n44=C$	$n13+n15+n45+n47=C$	$n14+n16+n46+n48=C$
$n33+n35+n41+n43=C$	$n34+n36+n42+n44=C$	$n37+n39+n45+n47=C$	$n38+n40+n46+n48=C$

16/d0	/d1	/d2	/d3	/d4	/d5	
1--- 5	2--- 6	3--- 7	4--- 8	17---21	18---22	...
9--13	10--14	11--15	12--16	25--29	26--30	
33-- 37	34-- 38	35-- 39	36-- 40	49-- 53	50-- 54	
41---45	42---46	43---47	44---48	57---61	58---62	

$n1+n5+n9+n13=C$	$n2+n6+n10+n14=C$	$n3+n7+n11+n15=C$	$n4+n8+n12+n16=C$
$n1+n5+n33+n37=C$	$n2+n6+n34+n38=C$	$n3+n7+n35+n39=C$	$n4+n8+n36+n40=C$
$n1+n9+n33+n41=C$	$n2+n10+n34+n42=C$	$n3+n11+n35+n43=C$	$n4+n12+n36+n44=C$
$n5+n13+n37+n45=C$	$n6+n14+n38+n46=C$	$n7+n15+n39+n47=C$	$n8+n16+n40+n48=C$
$n9+n13+n41+n45=C$	$n10+n14+n42+n46=C$	$n11+n15+n43+n47=C$	$n12+n16+n44+n48=C$
$n33+n37+n41+n45=C$	$n34+n38+n42+n46=C$	$n35+n39+n43+n47=C$	$n36+n40+n44+n48=C$

17/d0	/d1	/d2	/d3	/d4	/d5	
1--- 2	3--- 4	5--- 6	7--- 8	9---10	11---12	...
17--18	19--20	21--22	23--24	25--26	27--28	
33-- 34	35-- 36	37-- 38	39-- 40	41-- 42	43-- 44	
49---50	51---52	53---54	55---56	57---58	59---60	

$n1+n2+n17+n18=C$	$n3+n4+n19+n20=C$	$n5+n6+n21+n22=C$	$n7+n8+n23+n24=C$
$n1+n2+n33+n34=C$	$n3+n4+n35+n36=C$	$n5+n6+n37+n38=C$	$n7+n8+n39+n40=C$
$n1+n17+n33+n49=C$	$n3+n19+n35+n51=C$	$n5+n21+n37+n53=C$	$n7+n23+n39+n55=C$
$n2+n18+n34+n50=C$	$n4+n20+n36+n52=C$	$n6+n22+n38+n54=C$	$n8+n24+n40+n56=C$
$n17+n18+n49+n50=C$	$n19+n20+n51+n52=C$	$n21+n22+n53+n54=C$	$n23+n24+n55+n56=C$
$n33+n34+n49+n50=C$	$n35+n36+n51+n52=C$	$n37+n38+n53+n54=C$	$n39+n40+n55+n56=C$

18/d0	/d1	/d2	/d3	/d4	/d5
1--- 3	2--- 4	5--- 7	6--- 8	9---11	10---12 ...
17-+-19	18-+-20	21-+-23	22-+-24	25-+-27	26-+-28
33-- 35	34-- 36	37-- 39	38-- 40	41-- 43	42-- 44
49---51	50---52	53---55	54---56	57---59	58---60
n1+n3+n17+n19=C	n2+n4+n18+n20=C	n5+n7+n21+n23=C	n6+n8+n22+n24=C		
n1+n3+n33+n35=C	n2+n4+n34+n36=C	n5+n7+n37+n39=C	n6+n8+n38+n40=C		
n1+n17+n33+n49=C	n2+n18+n34+n50=C	n5+n21+n37+n53=C	n6+n22+n38+n54=C		
n3+n19+n35+n51=C	n4+n20+n36+n52=C	n7+n23+n39+n55=C	n8+n24+n40+n56=C		
n17+n19+n49+n51=C	n18+n20+n50+n52=C	n21+n23+n53+n55=C	n22+n24+n54+n56=C		
n33+n35+n49+n51=C	n34+n36+n50+n52=C	n37+n39+n53+n55=C	n38+n40+n54+n56=C		

19/d0	/d1	/d2	/d3	/d4	/d5
1--- 5	2--- 6	3--- 7	4--- 8	9---13	10---14 ...
17-+-21	18-+-22	19-+-23	20-+-24	25-+-29	26-+-30
33-- 37	34-- 38	35-- 39	36-- 40	41-- 45	42-- 46
49---53	50---54	51---55	52---56	57---61	58---62
n1+n5+n17+n21=C	n2+n6+n18+n22=C	n3+n7+n19+n23=C	n4+n8+n20+n24=C		
n1+n5+n33+n37=C	n2+n6+n34+n38=C	n3+n7+n35+n39=C	n4+n8+n36+n40=C		
n1+n17+n33+n49=C	n2+n18+n34+n50=C	n3+n19+n35+n51=C	n4+n20+n36+n52=C		
n5+n21+n37+n53=C	n6+n22+n38+n54=C	n7+n23+n39+n55=C	n8+n24+n40+n56=C		
n17+n21+n49+n53=C	n18+n22+n50+n54=C	n19+n23+n51+n55=C	n20+n24+n52+n56=C		
n33+n37+n49+n53=C	n34+n38+n50+n54=C	n35+n39+n51+n55=C	n36+n40+n52+n56=C		

20/d0	/d1	/d2	/d3	/d4	/d5
1--- 9	2---10	3---11	4---12	5---13	6---14 ...
17-+-25	18-+-26	19-+-27	20-+-28	21-+-29	22-+-30
33-- 41	34-- 42	35-- 43	36-- 44	37-- 45	38-- 46
49---57	50---58	51---59	52---60	53---61	54---62
n1+n9+n17+n25=C	n2+n10+n18+n26=C	n3+n11+n19+n27=C	n4+n12+n20+n28=C		
n1+n9+n33+n41=C	n2+n10+n34+n42=C	n3+n11+n35+n43=C	n4+n12+n36+n44=C		
n1+n17+n33+n49=C	n2+n18+n34+n50=C	n3+n19+n35+n51=C	n4+n20+n36+n52=C		
n9+n25+n41+n57=C	n10+n26+n42+n58=C	n11+n27+n43+n59=C	n12+n28+n44+n60=C		
n17+n25+n49+n57=C	n18+n26+n50+n58=C	n19+n27+n51+n59=C	n20+n28+n52+n60=C		
n33+n41+n49+n57=C	n34+n42+n50+n58=C	n35+n43+n51+n59=C	n36+n44+n52+n60=C		

But you may still find some duplications of the same equation. Of course, you can remove them all right and have got the smart list of simultaneous equations.

On the other hand, we also want to add the next equations to our definition.  
 $n1+n64=n2+n63=n3+n62=n4+n61=n5+n60=n6+n59=n7+n58=n8+n57=n9+n56$   
 $=n10+n55=n11+n54=n12+n53=n13+n52=n14+n51=n15+n50=n16+n49=n17+n48$   
 $=n18+n47=n19+n46=n20+n45=n21+n44=n22+n43=n23+n42=n24+n41=n25+n40$   
 $=n26+n39=n27+n38=n28+n37=n29+n36=n30+n35=n31+n34=n32+n33=CC=C/2=65$

These equations are called 'Self-Complementary Conditions'. They mean:

$$n64=CC-n1; n63=CC-n2; n62=CC-n3; n61=CC-n4; n60=CC-n5; n59=CC-n6; \dots$$

$$n38=CC-n27; n37=CC-n28; n36=CC-n29; n35=CC-n30; n34=CC-n31; n33=CC-n32;$$

Therefore  $n61+n62+n63+n64$

$$=(CC-n4)+(CC-n3)+(CC-n2)+(CC-n1)=4*CC-(n1+n2+n3+n4)=C$$

$$\text{In the same way } n43+n44+n47+n48=4*CC-(n17+n18+n21+n22)=C$$

$$n17+n18+n49+n50=4*CC-(n15+n16+n47+n48)=C$$

.....

As a consequence, when you assume  $(n1+n2+n3+n4=C)$  at first, you don't have to define  $(n61+n62+n63+n64=C)$  any longer. If you assume  $(n15+n16+n47+n48=C)$  beforehand, you don't have to define  $(n17+n18+n49+n50=C)$  any longer. ...

You can remove half of the equations above by these reasons.

\*\* Collection of 'Composite Conditions' \*\*

- |                     |            |                     |            |                     |            |
|---------------------|------------|---------------------|------------|---------------------|------------|
| $n1+n2+n3+n4=C$     | ... (1);   | $n1+n2+n5+n6=C$     | ... (2);   | $n1+n2+n9+n10=C$    | ... (3);   |
| $n1+n2+n17+n18=C$   | ... (4);   | $n1+n2+n33+n34=C$   | ... (5);   | $n1+n3+n5+n7=C$     | ... (6);   |
| $n1+n3+n9+n11=C$    | ... (7);   | $n1+n3+n17+n19=C$   | ... (8);   | $n1+n3+n33+n35=C$   | ... (9);   |
| $n1+n5+n9+n13=C$    | ... (10);  | $n1+n5+n17+n21=C$   | ... (11);  | $n1+n5+n33+n37=C$   | ... (12);  |
| $n1+n9+n17+n25=C$   | ... (13);  | $n1+n9+n33+n41=C$   | ... (14);  | $n1+n17+n33+n49=C$  | ... (15);  |
| $n2+n4+n6+n8=C$     | ... (16);  | $n2+n4+n10+n12=C$   | ... (17);  | $n2+n4+n18+n20=C$   | ... (18);  |
| $n2+n4+n34+n36=C$   | ... (19);  | $n2+n6+n10+n14=C$   | ... (20);  | $n2+n6+n18+n22=C$   | ... (21);  |
| $n2+n6+n34+n38=C$   | ... (22);  | $n2+n10+n18+n26=C$  | ... (23);  | $n2+n10+n34+n42=C$  | ... (24);  |
| $n2+n18+n34+n50=C$  | ... (25);  | $n3+n4+n7+n8=C$     | ... (26);  | $n3+n4+n11+n12=C$   | ... (27);  |
| $n3+n4+n19+n20=C$   | ... (28);  | $n3+n4+n35+n36=C$   | ... (29);  | $n3+n7+n11+n15=C$   | ... (30);  |
| $n3+n7+n19+n23=C$   | ... (31);  | $n3+n7+n35+n39=C$   | ... (32);  | $n3+n11+n19+n27=C$  | ... (33);  |
| $n3+n11+n35+n43=C$  | ... (34);  | $n3+n19+n35+n51=C$  | ... (35);  | $n4+n8+n12+n16=C$   | ... (36);  |
| $n4+n8+n20+n24=C$   | ... (37);  | $n4+n8+n36+n40=C$   | ... (38);  | $n4+n12+n20+n28=C$  | ... (39);  |
| $n4+n12+n36+n44=C$  | ... (40);  | $n4+n20+n36+n52=C$  | ... (41);  | $n5+n6+n7+n8=C$     | ... (42);  |
| $n5+n6+n13+n14=C$   | ... (43);  | $n5+n6+n21+n22=C$   | ... (44);  | $n5+n6+n37+n38=C$   | ... (45);  |
| $n5+n7+n13+n15=C$   | ... (46);  | $n5+n7+n21+n23=C$   | ... (47);  | $n5+n7+n37+n39=C$   | ... (48);  |
| $n5+n13+n21+n29=C$  | ... (49);  | $n5+n13+n37+n45=C$  | ... (50);  | $n5+n21+n37+n53=C$  | ... (51);  |
| $n6+n8+n14+n16=C$   | ... (52);  | $n6+n8+n22+n24=C$   | ... (53);  | $n6+n8+n38+n40=C$   | ... (54);  |
| $n6+n14+n22+n30=C$  | ... (55);  | $n6+n14+n38+n46=C$  | ... (56);  | $n6+n22+n38+n54=C$  | ... (57);  |
| $n7+n8+n15+n16=C$   | ... (58);  | $n7+n8+n23+n24=C$   | ... (59);  | $n7+n8+n39+n40=C$   | ... (60);  |
| $n7+n15+n23+n31=C$  | ... (61);  | $n7+n15+n39+n47=C$  | ... (62);  | $n7+n23+n39+n55=C$  | ... (63);  |
| $n8+n16+n24+n32=C$  | ... (64);  | $n8+n16+n40+n48=C$  | ... (65);  | $n8+n24+n40+n56=C$  | ... (66);  |
| $n9+n10+n11+n12=C$  | ... (67);  | $n9+n10+n13+n14=C$  | ... (68);  | $n9+n10+n25+n26=C$  | ... (69);  |
| $n9+n10+n41+n42=C$  | ... (70);  | $n9+n11+n13+n15=C$  | ... (71);  | $n9+n11+n25+n27=C$  | ... (72);  |
| $n9+n11+n41+n43=C$  | ... (73);  | $n9+n13+n25+n29=C$  | ... (74);  | $n9+n13+n41+n45=C$  | ... (75);  |
| $n10+n12+n14+n16=C$ | ... (76);  | $n10+n12+n26+n28=C$ | ... (77);  | $n10+n12+n42+n44=C$ | ... (78);  |
| $n10+n14+n26+n30=C$ | ... (79);  | $n10+n14+n42+n46=C$ | ... (80);  | $n11+n12+n15+n16=C$ | ... (81);  |
| $n11+n12+n27+n28=C$ | ... (82);  | $n11+n12+n43+n44=C$ | ... (83);  | $n11+n15+n27+n31=C$ | ... (84);  |
| $n11+n15+n43+n47=C$ | ... (85);  | $n12+n16+n28+n32=C$ | ... (86);  | $n12+n16+n44+n48=C$ | ... (87);  |
| $n13+n14+n15+n16=C$ | ... (88);  | $n13+n14+n29+n30=C$ | ... (89);  | $n13+n14+n45+n46=C$ | ... (90);  |
| $n13+n15+n29+n31=C$ | ... (91);  | $n13+n15+n45+n47=C$ | ... (92);  | $n14+n16+n30+n32=C$ | ... (93);  |
| $n14+n16+n46+n48=C$ | ... (94);  | $n15+n16+n31+n32=C$ | ... (95);  | $n15+n16+n47+n48=C$ | ... (96);  |
| $n17+n18+n19+n20=C$ | ... (97);  | $n17+n18+n21+n22=C$ | ... (98);  | $n17+n18+n25+n26=C$ | ... (99);  |
| $n17+n19+n21+n23=C$ | ... (100); | $n17+n19+n25+n27=C$ | ... (101); | $n17+n21+n25+n29=C$ | ... (102); |
| $n18+n20+n22+n24=C$ | ... (103); | $n18+n20+n26+n28=C$ | ... (104); | $n18+n22+n26+n30=C$ | ... (105); |
| $n19+n20+n23+n24=C$ | ... (106); | $n19+n20+n27+n28=C$ | ... (107); | $n19+n23+n27+n31=C$ | ... (108); |
| $n20+n24+n28+n32=C$ | ... (109); | $n21+n22+n23+n24=C$ | ... (110); | $n21+n22+n29+n30=C$ | ... (111); |
| $n21+n23+n29+n31=C$ | ... (112); | $n22+n24+n30+n32=C$ | ... (113); | $n23+n24+n31+n32=C$ | ... (114); |
| $n25+n26+n27+n28=C$ | ... (115); | $n25+n26+n29+n30=C$ | ... (116); | $n25+n27+n29+n31=C$ | ... (117); |
| $n26+n28+n30+n32=C$ | ... (118); | $n27+n28+n31+n32=C$ | ... (119); | $n29+n30+n31+n32=C$ | ... (120); |

See the next algebraic calculations. They show if you assume any 4 equations for each little cube beforehand, you don't have to define the rest 2 any longer.

1-----5	$n1+n2+n3+n4=C$	... (1)
\          \	$n1+n2+n5+n6=C$	... (2)
2-----6	$n1+n3+n5+n7=C$	... (3)
3- -----7	$n2+n4+n6+n8=C$	... (4)
\        \		
4-----8	$n1+n3+n5+n7=C$	... (3)
	+) $n2+n4+n6+n8=C$	... (4)
-----		
	$n1+n2+n3+n4+n5+n6+n7+n8=2*C$	
	$(n1+n2+n3+n4)+(n5+n6+n7+n8)=2*C$	
But	$n1+n2+n3+n4=C$	... (1)
Therefore	$n5+n6+n7+n8=C$	... (5)
	$n1+n3+n5+n7=C$	... (3)
	+) $n2+n4+n6+n8=C$	... (4)
	-----	
	$n1+n2+n3+n4+n5+n6+n7+n8=2*C$	

$$(n1+n2+n5+n6)+(n3+n4+n7+n8)=2*C$$

But  $n1+n2+n5+n6=C \quad \dots (2)$   
Therefore  $n3+n4+n7+n8=C \quad \dots (6)$

You can remove more by this reason and get such the smartest list as follows.

**\*\* Essential 49 Equations for 'Composite Conditions' \*\***

- $n1+n2+n3+n4=C \quad \dots (1); \quad n1+n2+n5+n6=C \quad \dots (2); \quad n1+n2+n9+n10=C \quad \dots (3);$
- $n1+n2+n17+n18=C \quad \dots (4); \quad n1+n2+n33+n34=C \quad \dots (5); \quad n1+n3+n5+n7=C \quad \dots (6);$
- $n1+n3+n9+n11=C \quad \dots (7); \quad n1+n3+n17+n19=C \quad \dots (8); \quad n1+n3+n33+n35=C \quad \dots (9);$
- $n1+n5+n9+n13=C \quad \dots (10); \quad n1+n5+n17+n21=C \quad \dots (11); \quad n1+n5+n33+n37=C \quad \dots (12);$
- $n1+n9+n17+n25=C \quad \dots (13); \quad n1+n9+n33+n41=C \quad \dots (14); \quad n1+n17+n33+n49=C \quad \dots (15);$
- $n2+n4+n6+n8=C \quad \dots (16); \quad n2+n4+n10+n12=C \quad \dots (17); \quad n2+n4+n18+n20=C \quad \dots (18);$
- $n2+n4+n34+n36=C \quad \dots (19); \quad n2+n6+n10+n14=C \quad \dots (20); \quad n2+n6+n18+n22=C \quad \dots (21);$
- $n2+n6+n34+n38=C \quad \dots (22); \quad n2+n10+n18+n26=C \quad \dots (23); \quad n2+n10+n34+n42=C \quad \dots (24);$
- $n2+n18+n34+n50=C \quad \dots (25); \quad n3+n7+n11+n15=C \quad \dots (26); \quad n3+n7+n19+n23=C \quad \dots (27);$
- $n3+n7+n35+n39=C \quad \dots (28); \quad n3+n11+n19+n27=C \quad \dots (29); \quad n3+n11+n35+n43=C \quad \dots (30);$
- $n3+n19+n35+n51=C \quad \dots (31); \quad n4+n8+n12+n16=C \quad \dots (32); \quad n4+n8+n20+n24=C \quad \dots (33);$
- $n4+n8+n36+n40=C \quad \dots (34); \quad n4+n12+n20+n28=C \quad \dots (35); \quad n4+n12+n36+n44=C \quad \dots (36);$
- $n4+n20+n36+n52=C \quad \dots (37); \quad n5+n13+n21+n29=C \quad \dots (38); \quad n5+n13+n37+n45=C \quad \dots (39);$
- $n5+n21+n37+n53=C \quad \dots (40); \quad n6+n14+n22+n30=C \quad \dots (41); \quad n6+n14+n38+n46=C \quad \dots (42);$
- $n6+n22+n38+n54=C \quad \dots (43); \quad n7+n15+n23+n31=C \quad \dots (44); \quad n7+n15+n39+n47=C \quad \dots (45);$
- $n7+n23+n39+n55=C \quad \dots (46); \quad n8+n16+n24+n32=C \quad \dots (47); \quad n8+n16+n40+n48=C \quad \dots (48);$
- $n8+n24+n40+n56=C \quad \dots (49);$

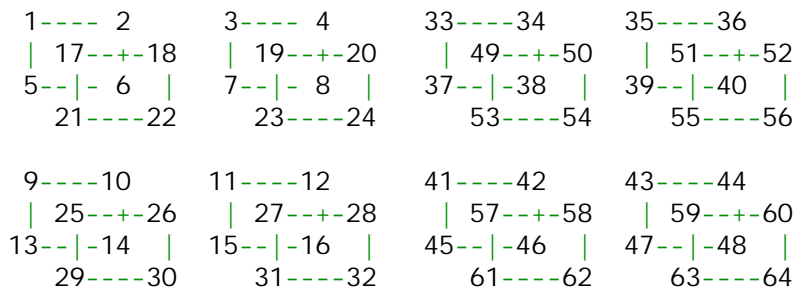
These 49 equations are logically equivalent even to the 960 equations of the first 20 diagrams. It means if you assume 49 beforehand, then you don't have to define anything more. But it doesn't mean that you must not take anything else.

You may well add any equations you have already removed from the lists above to our first definitions. These additions will make no difference at all. You will constantly have the same result, even if you revive many other equations.

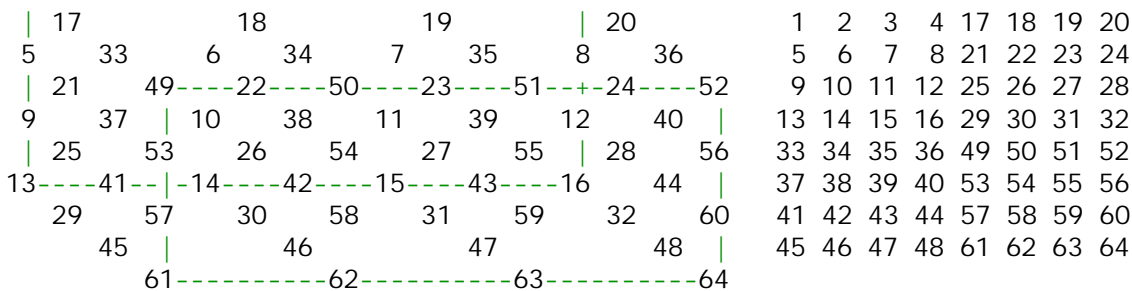
**#3. Composition of ECO2<sup>6</sup> Again**

Let's design and compose our ECO2<sup>6</sup> again strictly under these simultaneous equations and so-called 'Self-complementary conditions' along with the single set of Basic Diagrams shown below. It is almost all the same as Chapter 6.

**BD/EC08x2^3**



**SCM4^3/MS8^2**







```

        nm[1]=a; nm[64]=b;
        fl g[a]=1; fl g[b]=1;
        stp02();
        fl g[b]=0; fl g[a]=0; }
    }
}
/* Set n2 & n63 */
void stp02(){
    short a,b;
    for(a=64; a>0; a--){b=CC-a;
        if((fl g[a]==0)&&(fl g[b]==0)){
            nm[2]=a; nm[63]=b;
            fl g[a]=1; fl g[b]=1;
            stp03();
            fl g[b]=0; fl g[a]=0; }
        }
}
/* Set n3 & n62 */
void stp03(){
    short a,b;
    for(a=64; a>0; a--){b=CC-a;
        if((fl g[a]==0)&&(fl g[b]==0)){
            nm[3]=a; nm[62]=b;
            fl g[a]=1; fl g[b]=1;
            stp04();
            fl g[b]=0; fl g[a]=0; }
        }
}
/* Set n4=LSM-n1-n2-n3 & n61 */
void stp04(){
    short a,b;
    a=LSM-nm[1]-nm[2]-nm[3];
    if((0<a)&&(a<65)){b=CC-a;
        if((fl g[a]==0)&&(fl g[b]==0)){
            nm[4]=a; nm[61]=b;
            fl g[a]=1; fl g[b]=1;
            stp05();
            fl g[b]=0; fl g[a]=0; }}
}
/* Set n5 & n60 */
void stp05(){
    short a,b;
    for(a=64; a>0; a--){b=CC-a;
        if((fl g[a]==0)&&(fl g[b]==0)){
            nm[5]=a; nm[60]=b;
            fl g[a]=1; fl g[b]=1;
            stp06();
            fl g[b]=0; fl g[a]=0; }
        }
}
/* Set n6=LSM-n1-n2-n5 & n59 */
void stp06(){
    short a,b;
    a=LSM-nm[1]-nm[2]-nm[5];
    if((0<a)&&(a<65)){b=CC-a;
        if((fl g[a]==0)&&(fl g[b]==0)){
            nm[6]=a; nm[59]=b;
            fl g[a]=1; fl g[b]=1;
            stp07();

```

```

        fl g[b]=0; fl g[a]=0; }}
}
/* Set n7=LSM-n1-n3-n5 & n58 */
void stp07(){
short a,b;
a=LSM-nm[1]-nm[3]-nm[5];
if((0<a)&&(a<65)){b=CC-a;
if((fl g[a]==0)&&(fl g[b]==0)){
nm[7]=a; nm[58]=b;
fl g[a]=1; fl g[b]=1;
stp08();
fl g[b]=0; fl g[a]=0; }}
}
/* Set n8=LSM-n2-n4-n6 & n57 */
void stp08(){
short a,b;
a=LSM-nm[2]-nm[4]-nm[6];
if((0<a)&&(a<65)){b=CC-a;
if((fl g[a]==0)&&(fl g[b]==0)){
nm[8]=a; nm[57]=b;
fl g[a]=1; fl g[b]=1;
stp09();
fl g[b]=0; fl g[a]=0; }}
}
/* Search Level: 2 */
/* Set n9 & n56 */
void stp09(){
short a,b;
for(a=64;a>0;a--){b=CC-a;
if((fl g[a]==0)&&(fl g[b]==0)){
nm[9]=a; nm[56]=b;
fl g[a]=1; fl g[b]=1;
stp10();
fl g[b]=0; fl g[a]=0; }
}
}
/* Set n10=LSM-n1-n2-n9 & n55 */
void stp10(){
short a,b;
a=LSM-nm[1]-nm[2]-nm[9];
if((0<a)&&(a<65)){b=CC-a;
if((fl g[a]==0)&&(fl g[b]==0)){
nm[10]=a; nm[55]=b;
fl g[a]=1; fl g[b]=1;
stp11();
fl g[b]=0; fl g[a]=0; }}
}
/* Set n11=LSM-n1-n3-n9 & n54 */
void stp11(){
short a,b;
a=LSM-nm[1]-nm[3]-nm[9];
if((0<a)&&(a<65)){b=CC-a;
if((fl g[a]==0)&&(fl g[b]==0)){
nm[11]=a; nm[54]=b;
fl g[a]=1; fl g[b]=1;
stp12();
fl g[b]=0; fl g[a]=0; }}
}
/* Set n12=LSM-n2-n4-n10 & n53 */

```

```

void stp12(){
  short a,b;
  a=LSM-nm[2]-nm[4]-nm[10];
  if((0<a)&&(a<65)){b=CC-a;
    if((flg[a]==0)&&(flg[b]==0)){
      nm[12]=a; nm[53]=b;
      flg[a]=1; flg[b]=1;
      stp13();
      flg[b]=0; flg[a]=0; }}
}
/* Set n13=LSM-n1-n5-n9 & n52 */
void stp13(){
  short a,b;
  a=LSM-nm[1]-nm[5]-nm[9];
  if((0<a)&&(a<65)){b=CC-a;
    if((flg[a]==0)&&(flg[b]==0)){
      nm[13]=a; nm[52]=b;
      flg[a]=1; flg[b]=1;
      stp14();
      flg[b]=0; flg[a]=0; }}
}
/* Set n14=LSM-n2-n6-n10 & n51 */
void stp14(){
  short a,b;
  a=LSM-nm[2]-nm[6]-nm[10];
  if((0<a)&&(a<65)){b=CC-a;
    if((flg[a]==0)&&(flg[b]==0)){
      nm[14]=a; nm[51]=b;
      flg[a]=1; flg[b]=1;
      stp15();
      flg[b]=0; flg[a]=0; }}
}
/* Set n15=LSM-n3-n7-n11 & n50 */
void stp15(){
  short a,b;
  a=LSM-nm[3]-nm[7]-nm[11];
  if((0<a)&&(a<65)){b=CC-a;
    if((flg[a]==0)&&(flg[b]==0)){
      nm[15]=a; nm[50]=b;
      flg[a]=1; flg[b]=1;
      stp16();
      flg[b]=0; flg[a]=0; }}
}
/* Set n16=LSM-n4-n8-n12 & n49 */
void stp16(){
  short a,b;
  a=LSM-nm[4]-nm[8]-nm[12];
  if((0<a)&&(a<65)){b=CC-a;
    if((flg[a]==0)&&(flg[b]==0)){
      nm[16]=a; nm[49]=b;
      flg[a]=1; flg[b]=1;
      stp17();
      flg[b]=0; flg[a]=0; }}
}
/* Search Level : 3 */
/* Set n17 & n48 */
void stp17(){
  short a,b;
  for(a=64; a>0; a--){b=CC-a;

```

```

    if((flg[a]==0)&&(flg[b]==0)){
        nm[17]=a; nm[48]=b;
        flg[a]=1; flg[b]=1;
        stp18();
        flg[b]=0; flg[a]=0; }
}
}
/* Set n18=LSM-n1-n2-n17 & n47 */
void stp18(){
    short a,b;
    a=LSM-nm[1]-nm[2]-nm[17];
    if((0<a)&&(a<65)){b=CC-a;
        if((flg[a]==0)&&(flg[b]==0)){
            nm[18]=a; nm[47]=b;
            flg[a]=1; flg[b]=1;
            stp19();
            flg[b]=0; flg[a]=0; }}
}
/* Set n19=LSM-n1-n3-n17 & n46 */
void stp19(){
    short a,b;
    a=LSM-nm[1]-nm[3]-nm[17];
    if((0<a)&&(a<65)){b=CC-a;
        if((flg[a]==0)&&(flg[b]==0)){
            nm[19]=a; nm[46]=b;
            flg[a]=1; flg[b]=1;
            stp20();
            flg[b]=0; flg[a]=0; }}
}
/* Set n20=LSM-n2-n4-n18 & n45 */
void stp20(){
    short a,b;
    a=LSM-nm[2]-nm[4]-nm[18];
    if((0<a)&&(a<65)){b=CC-a;
        if((flg[a]==0)&&(flg[b]==0)){
            nm[20]=a; nm[45]=b;
            flg[a]=1; flg[b]=1;
            stp21();
            flg[b]=0; flg[a]=0; }}
}
/* Set n21=LSM-n1-n5-n17 & n44 */
void stp21(){
    short a,b;
    a=LSM-nm[1]-nm[5]-nm[17];
    if((0<a)&&(a<65)){b=CC-a;
        if((flg[a]==0)&&(flg[b]==0)){
            nm[21]=a; nm[44]=b;
            flg[a]=1; flg[b]=1;
            stp22();
            flg[b]=0; flg[a]=0; }}
}
/* Set n22=LSM-n2-n6-n18 & n43 */
void stp22(){
    short a,b;
    a=LSM-nm[2]-nm[6]-nm[18];
    if((0<a)&&(a<65)){b=CC-a;
        if((flg[a]==0)&&(flg[b]==0)){
            nm[22]=a; nm[43]=b;
            flg[a]=1; flg[b]=1;

```

```

        stp23();
        fl g[b]=0; fl g[a]=0; }}
}
/* Set n23=LSM-n3-n7-n19 & n42 */
void stp23(){
    short a,b;
    a=LSM-nm[3]-nm[7]-nm[19];
    if((0<a)&&(a<65)){b=CC-a;
        if((fl g[a]==0)&&(fl g[b]==0)){
            nm[23]=a; nm[42]=b;
            fl g[a]=1; fl g[b]=1;
            stp24();
            fl g[b]=0; fl g[a]=0; }}
}
/* Set n24=LSM-n4-n8-n20 & n41 */
void stp24(){
    short a,b;
    a=LSM-nm[4]-nm[8]-nm[20];
    if((0<a)&&(a<65)){b=CC-a;
        if((fl g[a]==0)&&(fl g[b]==0)){
            nm[24]=a; nm[41]=b;
            fl g[a]=1; fl g[b]=1;
            stp25();
            fl g[b]=0; fl g[a]=0; }}
}
/* Search Level: 4 */
/* Set n25=LSM-n1-n9-n17 & n40 */
void stp25(){
    short a,b;
    a=LSM-nm[1]-nm[9]-nm[17];
    if((0<a)&&(a<65)){b=CC-a;
        if((fl g[a]==0)&&(fl g[b]==0)){
            nm[25]=a; nm[40]=b;
            fl g[a]=1; fl g[b]=1;
            stp26();
            fl g[b]=0; fl g[a]=0; }}
}
/* Set n26=LSM-n2-n10-n18 & n39 */
void stp26(){
    short a,b;
    a=LSM-nm[2]-nm[10]-nm[18];
    if((0<a)&&(a<65)){b=CC-a;
        if((fl g[a]==0)&&(fl g[b]==0)){
            nm[26]=a; nm[39]=b;
            fl g[a]=1; fl g[b]=1;
            stp27();
            fl g[b]=0; fl g[a]=0; }}
}
/* Set n27=LSM-n3-n11-n19 & n38 */
void stp27(){
    short a,b;
    a=LSM-nm[3]-nm[11]-nm[19];
    if((0<a)&&(a<65)){b=CC-a;
        if((fl g[a]==0)&&(fl g[b]==0)){
            nm[27]=a; nm[38]=b;
            fl g[a]=1; fl g[b]=1;
            stp28();
            fl g[b]=0; fl g[a]=0; }}
}
}

```

```

/* Set n28=LSM-n4-n12-n20 & n37 */
void stp28(){
short a,b;
a=LSM-nm[4]-nm[12]-nm[20];
if((0<a)&&(a<65)){b=CC-a;
if((flg[a]==0)&&(flg[b]==0)){
nm[28]=a; nm[37]=b;
flg[a]=1; flg[b]=1;
stp29();
flg[b]=0; flg[a]=0; }}
}
/* Set n29=LSM-n5-n13-n21 & n36 */
void stp29(){
short a,b;
a=LSM-nm[5]-nm[13]-nm[21];
if((0<a)&&(a<65)){b=CC-a;
if((flg[a]==0)&&(flg[b]==0)){
nm[29]=a; nm[36]=b;
flg[a]=1; flg[b]=1;
stp30();
flg[b]=0; flg[a]=0; }}
}
/* Set n30=LSM-n6-n14-n22 & n35 */
void stp30(){
short a,b;
a=LSM-nm[6]-nm[14]-nm[22];
if((0<a)&&(a<65)){b=CC-a;
if((flg[a]==0)&&(flg[b]==0)){
nm[30]=a; nm[35]=b;
flg[a]=1; flg[b]=1;
stp31();
flg[b]=0; flg[a]=0; }}
}
/* Set n31=LSM-n7-n15-n23 & n34 */
void stp31(){
short a,b;
a=LSM-nm[7]-nm[15]-nm[23];
if((0<a)&&(a<65)){b=CC-a;
if((flg[a]==0)&&(flg[b]==0)){
nm[31]=a; nm[34]=b;
flg[a]=1; flg[b]=1;
stp32();
flg[b]=0; flg[a]=0; }}
}
/* Set n32=LSM-n8-n16-n24 & n33 */
void stp32(){
short a,b;
a=LSM-nm[8]-nm[16]-nm[24];
b=LSM-nm[1]-nm[2]-nm[34];
if((0<a)&&(a<65)&&(a+b==CC)){
if((flg[a]==0)&&(flg[b]==0)){
nm[32]=a; nm[33]=b;
flg[a]=1; flg[b]=1;
stp33();
flg[b]=0; flg[a]=0; }}
}
/**/
/* Check some Composite Sums */
void stp33(){

```

```

short sm1, sm2, sm3;
sm1=nm[1]+nm[3]+nm[33]+nm[35];
sm2=nm[1]+nm[5]+nm[33]+nm[37];
sm3=nm[1]+nm[9]+nm[33]+nm[41];
if((sm1==LSM)&&(sm2==LSM)&&(sm3==LSM)){stp34();}
}
/**/
/* Check some Composite Sums */
void stp34(){
short sm1, sm2, sm3;
sm1=nm[1]+nm[17]+nm[33]+nm[49];
sm2=nm[2]+nm[4]+nm[34]+nm[36];
sm3=nm[2]+nm[6]+nm[34]+nm[38];
if((sm1==LSM)&&(sm2==LSM)&&(sm3==LSM)){stp35();}
}
/**/
/* Check some Composite Sums */
void stp35(){
short sm1, sm2, sm3;
sm1=nm[2]+nm[10]+nm[34]+nm[42];
sm2=nm[2]+nm[18]+nm[34]+nm[50];
sm3=nm[3]+nm[7]+nm[35]+nm[39];
if((sm1==LSM)&&(sm2==LSM)&&(sm3==LSM)){stp36();}
}
/**/
/* Check some Composite Sums */
void stp36(){
short sm1, sm2, sm3;
sm1=nm[3]+nm[11]+nm[35]+nm[43];
sm2=nm[3]+nm[19]+nm[35]+nm[51];
sm3=nm[4]+nm[8]+nm[36]+nm[40];
if((sm1==LSM)&&(sm2==LSM)&&(sm3==LSM)){stp37();}
}
/**/
/* Check some Composite Sums */
void stp37(){
short sm1, sm2, sm3;
sm1=nm[4]+nm[12]+nm[36]+nm[44];
sm2=nm[4]+nm[20]+nm[36]+nm[52];
sm3=nm[5]+nm[13]+nm[37]+nm[45];
if((sm1==LSM)&&(sm2==LSM)&&(sm3==LSM)){stp38();}
}
/**/
/* Check some Composite Sums */
void stp38(){
short sm1, sm2, sm3;
sm1=nm[5]+nm[21]+nm[37]+nm[53];
sm2=nm[6]+nm[14]+nm[38]+nm[46];
sm3=nm[6]+nm[22]+nm[38]+nm[54];
if((sm1==LSM)&&(sm2==LSM)&&(sm3==LSM)){stp39();}
}
/**/
/* Check some Composite Sums */
void stp39(){
short sm1, sm2, sm3;
sm1=nm[7]+nm[15]+nm[39]+nm[47];
sm2=nm[7]+nm[23]+nm[39]+nm[55];
sm3=nm[8]+nm[16]+nm[40]+nm[48];
if((sm1==LSM)&&(sm2==LSM)&&(sm3==LSM)){stp40();}
}

```

```

}
/**/
/* Last Check of Composite Sums */
void stp40(){
short sm1, sm2, sm3;
sm1=nm[8]+nm[24]+nm[40]+nm[56];
sm2=nm[17]+nm[18]+nm[49]+nm[50];
sm3=nm[31]+nm[32]+nm[63]+nm[64];
if((sm1==LSM)&&(sm2==LSM)&&(sm3==LSM)){
ans26print();}
}
/**/
/* Print Procedure for Listing the Answers */
void ans26print(){
cnt++;
printf("\n%2d/2^6\n", cnt);
pr1pat26();
pr2pat26();
pr3pat26();
}
/**/
/* Print the Pattern-1 */
void pr1pat26(){
printf("%4d----%2d%7d----%2d", nm[1], nm[2], nm[3], nm[4]);
printf("%8d----%2d%7d----%2d\n", nm[33], nm[34], nm[35], nm[36]);
printf("    |%3d---+%2d    |%3d---+%2d", nm[17], nm[18], nm[19], nm[20]);
printf("    |%3d---+%2d    |%3d---+%2d\n", nm[49], nm[50], nm[51], nm[52]);
printf("%4d--|-%2d    |%4d--|-%2d    |", nm[5], nm[6], nm[7], nm[8]);
printf("%5d--|-%2d    |%4d--|-%2d    |\n", nm[37], nm[38], nm[39], nm[40]);
printf("%7d----%2d%7d----%2d", nm[21], nm[22], nm[23], nm[24]);
printf("%8d----%2d%7d----%2d\n\n", nm[53], nm[54], nm[55], nm[56]);
/**/
printf("%4d----%2d%7d----%2d", nm[9], nm[10], nm[11], nm[12]);
printf("%8d----%2d%7d----%2d\n", nm[41], nm[42], nm[43], nm[44]);
printf("    |%3d---+%2d    |%3d---+%2d", nm[25], nm[26], nm[27], nm[28]);
printf("    |%3d---+%2d    |%3d---+%2d\n", nm[57], nm[58], nm[59], nm[60]);
printf("%4d--|-%2d    |%4d--|-%2d    |", nm[13], nm[14], nm[15], nm[16]);
printf("%5d--|-%2d    |%4d--|-%2d    |\n", nm[45], nm[46], nm[47], nm[48]);
printf("%7d----%2d%7d----%2d", nm[29], nm[30], nm[31], nm[32]);
printf("%8d----%2d%7d----%2d\n", nm[61], nm[62], nm[63], nm[64]);
}
/**/
/* Print the Pattern-2 */
void pr2pat26(){
printf("\n%3d-----%2d-----%2d-----%2d          SC4^3/8^2\n",
nm[1], nm[2], nm[3], nm[4]);
printf("    |%2d%12d%12d    |%2d", nm[17], nm[18], nm[19], nm[20]);
printf("%11d%3d%3d%3d", nm[1], nm[2], nm[3], nm[4]);
printf("%3d%3d%3d%3d\n", nm[17], nm[18], nm[19], nm[20]);
printf("%3d%6d%6d%6d", nm[5], nm[33], nm[6], nm[34]);
printf("%6d%6d%6d%6d", nm[7], nm[35], nm[8], nm[36]);
printf("%8d%3d%3d%3d", nm[5], nm[6], nm[7], nm[8]);
printf("%3d%3d%3d%3d\n", nm[21], nm[22], nm[23], nm[24]);
printf("    |%2d%6d----%2d----%2d", nm[21], nm[49], nm[22], nm[50]);
printf("----%2d----%2d---+%2d----%2d", nm[23], nm[51], nm[24], nm[52]);
printf("%5d%3d%3d%3d", nm[9], nm[10], nm[11], nm[12]);
printf("%3d%3d%3d%3d\n", nm[25], nm[26], nm[27], nm[28]);
printf("%3d%6d    |%2d%6d", nm[9], nm[37], nm[10], nm[38]);
printf("%6d%6d%6d%6d    |", nm[11], nm[39], nm[12], nm[40]);
}

```



```

printf("%5d%3d%3d%3d", nm[13], nm[14], nm[15], nm[16]);
printf("%3d%3d%3d%3d\n", nm[29], nm[30], nm[31], nm[32]);
printf(" | %2d%6d%6d%6d", nm[25], nm[53], nm[26], nm[54]);
printf("%6d%6d | %2d%6d", nm[27], nm[55], nm[28], nm[56]);
printf("%5d%3d%3d%3d", nm[33], nm[34], nm[35], nm[36]);
printf("%3d%3d%3d%3d\n", nm[49], nm[50], nm[51], nm[52]);
printf("%3d----%2d-- |-%2d----%2d", nm[13], nm[41], nm[14], nm[42]);
printf("----%2d----%2d----%2d%6d |", nm[15], nm[43], nm[16], nm[44]);
printf("%5d%3d%3d%3d", nm[37], nm[38], nm[39], nm[40]);
printf("%3d%3d%3d%3d\n", nm[53], nm[54], nm[55], nm[56]);
printf("%6d%6d%6d%6d", nm[29], nm[57], nm[30], nm[58]);
printf("%6d%6d%6d%6d", nm[31], nm[59], nm[32], nm[60]);
printf("%5d%3d%3d%3d", nm[41], nm[42], nm[43], nm[44]);
printf("%3d%3d%3d%3d\n", nm[57], nm[58], nm[59], nm[60]);
printf("%9d |%9d%12d%12d |", nm[45], nm[46], nm[47], nm[48]);
printf("%5d%3d%3d%3d", nm[45], nm[46], nm[47], nm[48]);
printf("%3d%3d%3d%3d\n", nm[61], nm[62], nm[63], nm[64]);
printf("%12d-----%2d-----%2d-----%2d\n",
nm[61], nm[62], nm[63], nm[64]);
}
/**/
/* Print the Pattern-3 */
void pr3pat26(){
printf("\n%3d-----%2d-----%2d-----%2d          CC4^3/8^2\n",
nm[1], nm[2], nm[4], nm[3]);
printf(" | %2d%12d%12d | %2d", nm[17], nm[18], nm[20], nm[19]);
printf("%11d%3d%3d%3d", nm[1], nm[2], nm[4], nm[3]);
printf("%3d%3d%3d%3d\n", nm[29], nm[30], nm[32], nm[31]);
printf("%3d%6d%6d%6d", nm[5], nm[49], nm[6], nm[50]);
printf("%6d%6d%6d%6d", nm[8], nm[52], nm[7], nm[51]);
printf("%8d%3d%3d%3d", nm[5], nm[6], nm[8], nm[7]);
printf("%3d%3d%3d%3d\n", nm[25], nm[26], nm[28], nm[27]);
printf(" | %2d%6d----%2d----%2d", nm[21], nm[33], nm[22], nm[34]);
printf("----%2d----%2d--+-%2d----%2d", nm[24], nm[36], nm[23], nm[35]);
printf("%5d%3d%3d%3d", nm[13], nm[14], nm[16], nm[15]);
printf("%3d%3d%3d%3d\n", nm[17], nm[18], nm[20], nm[19]);
printf("%3d%6d | %2d%6d", nm[13], nm[53], nm[14], nm[54]);
printf("%6d%6d%6d%6d |", nm[16], nm[56], nm[15], nm[55]);
printf("%5d%3d%3d%3d", nm[9], nm[10], nm[12], nm[11]);
printf("%3d%3d%3d%3d\n", nm[21], nm[22], nm[24], nm[23]);
printf(" | %2d%6d%6d%6d", nm[29], nm[37], nm[30], nm[38]);
printf("%6d%6d | %2d%6d", nm[32], nm[40], nm[31], nm[39]);
printf("%5d%3d%3d%3d", nm[36], nm[35], nm[33], nm[34]);
printf("%3d%3d%3d%3d\n", nm[64], nm[63], nm[61], nm[62]);
printf("%3d----%2d-- |-%2d----%2d", nm[9], nm[61], nm[10], nm[62]);
printf("----%2d----%2d----%2d%6d |", nm[12], nm[64], nm[11], nm[63]);
printf("%5d%3d%3d%3d", nm[40], nm[39], nm[37], nm[38]);
printf("%3d%3d%3d%3d\n", nm[60], nm[59], nm[57], nm[58]);
printf("%6d%6d%6d%6d", nm[25], nm[45], nm[26], nm[46]);
printf("%6d%6d%6d%6d", nm[28], nm[48], nm[27], nm[47]);
printf("%5d%3d%3d%3d", nm[48], nm[47], nm[45], nm[46]);
printf("%3d%3d%3d%3d\n", nm[52], nm[51], nm[49], nm[50]);
printf("%9d |%9d%12d%12d |", nm[57], nm[58], nm[60], nm[59]);
printf("%5d%3d%3d%3d", nm[44], nm[43], nm[41], nm[42]);
printf("%3d%3d%3d%3d\n", nm[56], nm[55], nm[53], nm[54]);
printf("%12d-----%2d-----%2d-----%2d\n",
nm[41], nm[42], nm[44], nm[43]);
}
/**/

```

\*\* Make the Extra-Cubic Magic Objects of Order  $2^6$  and \*\*  
 \*\* Transform them into SC & CC Magic Cubes & Squares \*\*

$1/2^6$

1---63	62----4	32----34	35----29
48---18	19---45	49---15	14---52
60-- -6	7-- -57	37-- -27	26-- -40
21---43	42---24	12---54	55---9

56---10	11---53	41---23	22---44
25---39	38---28	8---58	59---5
13-- -51	50-- -16	20-- -46	47-- -17
36---30	31---33	61---3	2---64

1-----63-----62-----4	SC4^3/8^2
48 18 19 45	1 63 62 4 48 18 19 45
60 32 6 34 7 35 57 29	60 6 7 57 21 43 42 24
21 49---43---15---42---14---24---52	56 10 11 53 25 39 38 28
56 37   10 27 11 26 53 40	13 51 50 16 36 30 31 33
25 12 39 54 38 55   28 9	32 34 35 29 49 15 14 52
13---41-- -51---23---50---22---16 44	37 27 26 40 12 54 55 9
36 8 30 58 31 59 33 5	41 23 22 44 8 58 59 5
20   46 47 17	20 46 47 17 61 3 2 64
61-----3-----2-----64	

1-----63-----4-----62	CC4^3/8^2
48 18 45 19	1 63 4 62 36 30 33 31
60 49 6 15 57 52 7 14	60 6 57 7 25 39 28 38
21 32---43---34---24---29---42---35	13 51 16 50 48 18 45 19
13 12   51 54 16 9 50 55	56 10 53 11 21 43 24 42
36 37 30 27 33 40   31 26	29 35 32 34 64 2 61 3
56---61-- -10---3---53---64---11 2	40 26 37 27 5 59 8 58
25 20 39 46 28 17 38 47	17 47 20 46 52 14 49 15
8   58 5 59	44 22 41 23 9 55 12 54
41-----23-----44-----22	

$121/2^6$

1---62	63----4	32---35	34---29
48---19	18---45	49---14	15---52
60-- -7	6-- -57	37-- -26	27-- -40
21---42	43---24	12---55	54---9

56---11	10---53	41---22	23---44
25---38	39---28	8---59	58---5
13-- -50	51-- -16	20-- -47	46-- -17
36---31	30---33	61---2	3---64

1-----62-----63-----4	SC4^3/8^2
48 19 18 45	1 62 63 4 48 19 18 45
60 32 7 35 6 34 57 29	60 7 6 57 21 42 43 24
21 49---42---14---43---15---24---52	56 11 10 53 25 38 39 28
56 37   11 26 10 27 53 40	13 50 51 16 36 31 30 33
25 12 38 55 39 54   28 9	32 35 34 29 49 14 15 52
13---41-- -50---22---51---23---16 44	37 26 27 40 12 55 54 9
36 8 31 59 30 58 33 5	41 22 23 44 8 59 58 5
20   47 46 17	20 47 46 17 61 2 3 64
61-----2-----3-----64	

1	-----62-----					4	-----63					CC4^3/8^2							
	48		19			45			18			1	62	4	63	36	31	33	30
60	49	7	14	57	52	6	15					60	7	57	6	25	38	28	39
	21	32	-----42-----	35	-----24-----	29	-----43-----	34				13	50	16	51	48	19	45	18
13	12		50	55	16	9	51	54				56	11	53	10	21	42	24	43
	36	37	31	26	33	40		30	27			29	34	32	35	64	3	61	2
56	-----61	-----11	-----2	-----53	-----64	-----10						40	27	37	26	5	58	8	59
	25	20	38	47	28	17	39	46				17	46	20	47	52	15	49	14
		8		59		5	58					44	23	41	22	9	54	12	55
		41	-----22	-----44	-----23														

241/2^6

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

1	-----60	-----63	-----6	SC4^3/8^2													
	48		21		18			43		1	60	63	6	48	21	18	43
62	32	7	37	4	34	57	27			62	7	4	57	19	42	45	24
	19	49	-----42	-----12	-----45	-----15	-----24	-----54		56	13	10	51	25	36	39	30
56	35		13	26	10	29	51	40		11	50	53	16	38	31	28	33
	25	14	36	55	39	52		30	9	32	37	34	27	49	12	15	54
11	-----41	-----50	-----20	-----53	-----23	-----16	46			35	26	29	40	14	55	52	9
	38	8	31	61	28	58	33	3		41	20	23	46	8	61	58	3
		22		47		44		17		22	47	44	17	59	2	5	64
		59	-----2	-----5	-----64												

1	-----60	-----6	-----63	CC4^3/8^2													
	48		21		43			18		1	60	6	63	38	31	33	28
62	49	7	12	57	54	4	15			62	7	57	4	25	36	30	39
	19	32	-----42	-----37	-----24	-----27	-----45	-----34		11	50	16	53	48	21	43	18
11	14		50	55	16	9	53	52		56	13	51	10	19	42	24	45
	38	35	31	26	33	40		28	29	27	34	32	37	64	5	59	2
56	-----59	-----13	-----2	-----51	-----64	-----10				40	29	35	26	3	58	8	61
	25	22	36	47	30	17	39	44		17	44	22	47	54	15	49	12
		8		61		3	58			46	23	41	20	9	52	14	55
		41	-----20	-----46	-----23												

361/2^6

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

1	-----56	-----63	-----10	SC4^3/8^2													
	48		25		18			39		1	56	63	10	48	25	18	39
62	32	11	41	4	34	53	23			62	11	4	53	19	38	45	28
	19	49	-----38	-----8	-----45	-----15	-----28	-----58		60	13	6	51	21	36	43	30
60	35		13	22	6	29	51	44		7	50	57	16	42	31	24	33
	21	14	36	59	43	52		30	5	32	41	34	23	49	8	15	58
7	-----37	-----50	-----20	-----57	-----27	-----16	46			35	22	29	44	14	59	52	5
	42	12	31	61	24	54	33	3		37	20	27	46	12	61	54	3
		26		47		40		17		26	47	40	17	55	2	9	64
		55	-----2	-----9	-----64												

1	-----56-----10-----63	CC4^3/8^2	1 56 10 63 42 31 33 24
62	48 25 39 18 15		62 11 53 4 21 36 30 43
7	19 32 38 41 28 23 45 34		7 50 16 57 48 25 39 18
60	14 50 59 16 5 57 52		60 13 51 6 19 38 28 45
60	-----55-----13-----2-----51-----64-----6		23 34 32 41 64 9 55 2
7	42 35 31 22 33 44 24 29		44 29 35 22 3 54 12 61
62	21 26 36 47 30 17 43 40		17 40 26 47 58 15 49 8
7	12 61 3 54		46 27 37 20 5 52 14 59
60	-----37-----20-----46-----27		

481/2^6

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

1	-----48-----63-----18	SC4^3/8^2	1 48 63 18 56 25 10 39
62	56 32 19 49 4 34 45 15		62 19 4 45 11 38 53 28
60	11 41 38 8 53 23 28 58		60 21 6 43 13 36 51 30
60	35 21 14 6 29 43 52		7 42 57 24 50 31 16 33
7	13 22 36 59 51 44 30 5		32 49 34 15 41 8 23 58
60	-----7-----37-----42-----12-----57-----27-----24		35 14 29 52 22 59 44 5
7	50 20 31 61 16 46 33 3		37 12 27 54 20 61 46 3
60	26 47 55 40 9		26 55 40 9 47 2 17 64
60	-----47-----2-----17-----64		

1	-----48-----18-----63	CC4^3/8^2	1 48 18 63 50 31 33 16
62	56 41 19 8 45 58 4 23		62 19 45 4 13 36 30 51
62	11 32 38 49 28 15 53 34		7 42 24 57 56 25 39 10
7	22 42 59 24 5 57 44		60 21 43 6 11 38 28 53
60	50 35 31 14 33 52 16 29		15 34 32 49 64 17 47 2
60	-----47-----21-----2-----43-----64-----6		52 29 35 14 3 46 20 61
60	13 26 36 55 30 9 51 40		9 40 26 55 58 23 41 8
60	20 61 3 46		54 27 37 12 5 44 22 59
60	-----37-----12-----54-----27		

601/2^6

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

1	-----32-----63-----34	SC4^3/8^2	1 32 63 34 56 41 10 23
62	56 48 35 49 4 18 29 15		62 35 4 29 11 22 53 44
60	11 25 22 8 53 39 44 58		60 37 6 27 13 20 51 46
60	19 37 14 6 45 27 52		7 26 57 40 50 47 16 17
7	13 38 20 59 51 28 46 5		48 49 18 15 25 8 39 58
60	-----7-----21-----26-----12-----57-----43-----40		19 14 45 52 38 59 28 5
60	50 36 47 61 16 30 17 3		21 12 43 54 36 61 30 3
60	42 61 55 24 9		42 55 24 9 31 2 33 64
60	-----31-----2-----33-----64		

1-----32-----34-----63 CC4^3/8^2

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

721/2^6

<pre> 2-----64   47---17 59--  5   8-- -58   22-----44 41-----23 </pre>	<pre> 61----- 3   20---46 8-- -58   41-----23 </pre>	<pre> 31-----33   50---16 38-- -28   11-----53 </pre>	<pre> 36-----30   13---51 25-- -39   56-----10 </pre>
---	--	---	---

<pre> 55----- 9   26---40 14-- -52   35-----29 </pre>	<pre> 12-----54   37---27 49-- -15   32-----34 </pre>	<pre> 42-----24   7---57 19-- -45   62----- 4 </pre>	<pre> 21-----43   60--- 6 48-- -18   1-----63 </pre>
---	---	--	--

2-----64-----61----- 3 SC4^3/8^2

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

2-----64----- 3-----61 CC4^3/8^2

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

841/2^6

<pre> 2-----61   47---20 59--  8   5-- -58   22-----41 44-----23 </pre>	<pre> 64----- 3   17---46 5-- -58   44-----23 </pre>	<pre> 31-----36   50---13 38-- -25   11-----56 </pre>	<pre> 33-----30   16---51 28-- -39   53-----10 </pre>
---	--	---	---

<pre> 55-----12   26---37 14-- -49   35-----32 </pre>	<pre> 9-----54   40---27 52-- -15   29-----34 </pre>	<pre> 42-----21   7---60 19-- -48   62----- 1 </pre>	<pre> 24-----43   57--- 6 45-- -18   4-----63 </pre>
---	--	--	--

961/2^6

<pre> 2-----59   47---22 61--  8   3-- -58   20-----41 46-----23 </pre>	<pre> 64----- 5   17---44 3-- -58   46-----23 </pre>	<pre> 31-----38   50---11 36-- -25   13-----56 </pre>	<pre> 33-----28   16---53 30-- -39   51-----10 </pre>
---	--	---	---

<pre> 55-----14   26---35 12-- -49   37-----32 </pre>	<pre> 9-----52   40---29 54-- -15   27-----34 </pre>	<pre> 42-----19   7---62 21-- -48   60----- 1 </pre>	<pre> 24-----45   57--- 4 43-- -18   6-----63 </pre>
---	--	--	--

1081/2^6

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

1201/2^6

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

1321/2^6

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

1441/2^6

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

. . . . .

\*\* Transform them into 'Composite and Complete' MS8^2 \*\*

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

30241/				30961/				31681/			
43 54 3 30 19 14 59 38	44 53 4 29 20 13 60 37	45 52 5 28 21 12 61 36									
24 9 64 33 48 49 8 25	23 10 63 34 47 50 7 26	24 9 64 33 48 49 8 25									
42 55 2 31 18 15 58 39	41 56 1 32 17 16 57 40	42 55 2 31 18 15 58 39									
21 12 61 36 45 52 5 28	22 11 62 35 46 51 6 27	19 14 59 38 43 54 3 30									
46 51 6 27 22 11 62 35	45 52 5 28 21 12 61 36	44 53 4 29 20 13 60 37									
17 16 57 40 41 56 1 32	18 15 58 39 42 55 2 31	17 16 57 40 41 56 1 32									
47 50 7 26 23 10 63 34	48 49 8 25 24 9 64 33	47 50 7 26 23 10 63 34									
20 13 60 37 44 53 4 29	19 14 59 38 43 54 3 30	22 11 62 35 46 51 6 27									
32401/				33121/				33841/			
46 51 6 27 22 11 62 35	47 50 7 26 23 10 63 34	48 49 8 25 24 9 64 33									
23 10 63 34 47 50 7 26	22 11 62 35 46 51 6 27	21 12 61 36 45 52 5 28									
41 56 1 32 17 16 57 40	41 56 1 32 17 16 57 40	42 55 2 31 18 15 58 39									
20 13 60 37 44 53 4 29	20 13 60 37 44 53 4 29	19 14 59 38 43 54 3 30									
43 54 3 30 19 14 59 38	42 55 2 31 18 15 58 39	41 56 1 32 17 16 57 40									
18 15 58 39 42 55 2 31	19 14 59 38 43 54 3 30	20 13 60 37 44 53 4 29									
48 49 8 25 24 9 64 33	48 49 8 25 24 9 64 33	47 50 7 26 23 10 63 34									
21 12 61 36 45 52 5 28	21 12 61 36 45 52 5 28	22 11 62 35 46 51 6 27									
34561/				35281/				36001/			
49 48 1 32 9 24 57 40	50 47 2 31 10 23 58 39	51 46 3 30 11 22 59 38									
15 18 63 34 55 42 7 26	16 17 64 33 56 41 8 25	16 17 64 33 56 41 8 25									
52 45 4 29 12 21 60 37	51 46 3 30 11 22 59 38	50 47 2 31 10 23 58 39									
14 19 62 35 54 43 6 27	13 20 61 36 53 44 5 28	13 20 61 36 53 44 5 28									
56 41 8 25 16 17 64 33	55 42 7 26 15 18 63 34	54 43 6 27 14 19 62 35									
10 23 58 39 50 47 2 31	9 24 57 40 49 48 1 32	9 24 57 40 49 48 1 32									
53 44 5 28 13 20 61 36	54 43 6 27 14 19 62 35	55 42 7 26 15 18 63 34									
11 22 59 38 51 46 3 30	12 21 60 37 52 45 4 29	12 21 60 37 52 45 4 29									
36721/				37441/				38161/			
52 45 4 29 12 21 60 37	53 44 5 28 13 20 61 36	54 43 6 27 14 19 62 35									
15 18 63 34 55 42 7 26	16 17 64 33 56 41 8 25	15 18 63 34 55 42 7 26									
49 48 1 32 9 24 57 40	50 47 2 31 10 23 58 39	49 48 1 32 9 24 57 40									
14 19 62 35 54 43 6 27	11 22 59 38 51 46 3 30	12 21 60 37 52 45 4 29									
53 44 5 28 13 20 61 36	52 45 4 29 12 21 60 37	51 46 3 30 11 22 59 38									
10 23 58 39 50 47 2 31	9 24 57 40 49 48 1 32	10 23 58 39 50 47 2 31									
56 41 8 25 16 17 64 33	55 42 7 26 15 18 63 34	56 41 8 25 16 17 64 33									
11 22 59 38 51 46 3 30	14 19 62 35 54 43 6 27	13 20 61 36 53 44 5 28									
38881/				39601/				40321/			
55 42 7 26 15 18 63 34	56 41 8 25 16 17 64 33	57 40 9 24 13 20 61 36									
14 19 62 35 54 43 6 27	13 20 61 36 53 44 5 28	16 17 64 33 60 37 12 21									
49 48 1 32 9 24 57 40	50 47 2 31 10 23 58 39	50 47 2 31 6 27 54 43									
12 21 60 37 52 45 4 29	11 22 59 38 51 46 3 30	7 26 55 42 51 46 3 30									
50 47 2 31 10 23 58 39	49 48 1 32 9 24 57 40	52 45 4 29 8 25 56 41									
11 22 59 38 51 46 3 30	12 21 60 37 52 45 4 29	5 28 53 44 49 48 1 32									
56 41 8 25 16 17 64 33	55 42 7 26 15 18 63 34	59 38 11 22 15 18 63 34									
13 20 61 36 53 44 5 28	14 19 62 35 54 43 6 27	14 19 62 35 58 39 10 23									
41041/				41761/				42481/			
58 39 10 23 14 19 62 35	59 38 11 22 15 18 63 34	60 37 12 21 16 17 64 33									
15 18 63 34 59 38 11 22	14 19 62 35 58 39 10 23	13 20 61 36 57 40 9 24									
49 48 1 32 5 28 53 44	49 48 1 32 5 28 53 44	50 47 2 31 6 27 54 43									
8 25 56 41 52 45 4 29	8 25 56 41 52 45 4 29	7 26 55 42 51 46 3 30									
51 46 3 30 7 26 55 42	50 47 2 31 6 27 54 43	49 48 1 32 5 28 53 44									
6 27 54 43 50 47 2 31	7 26 55 42 51 46 3 30	8 25 56 41 52 45 4 29									
60 37 12 21 16 17 64 33	60 37 12 21 16 17 64 33	59 38 11 22 15 18 63 34									
13 20 61 36 57 40 9 24	13 20 61 36 57 40 9 24	14 19 62 35 58 39 10 23									
43201/				43921/				44641/			
61 36 13 20 15 18 63 34	62 35 14 19 16 17 64 33	63 34 15 18 16 17 64 33									
12 21 60 37 58 39 10 23	11 22 59 38 57 40 9 24	10 23 58 39 57 40 9 24									
49 48 1 32 3 30 51 46	50 47 2 31 4 29 52 45	51 46 3 30 4 29 52 45									
8 25 56 41 54 43 6 27	7 26 55 42 53 44 5 28	6 27 54 43 53 44 5 28									
50 47 2 31 4 29 52 45	49 48 1 32 3 30 51 46	49 48 1 32 2 31 50 47									
7 26 55 42 53 44 5 28	8 25 56 41 54 43 6 27	8 25 56 41 55 42 7 26									
62 35 14 19 16 17 64 33	61 36 13 20 15 18 63 34	61 36 13 20 14 19 62 35									
11 22 59 38 57 40 9 24	12 21 60 37 58 39 10 23	12 21 60 37 59 38 11 22									

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45361/
64 33 16 17 15 18 63 34
9 24 57 40 58 39 10 23
52 45 4 29 3 30 51 46
5 28 53 44 54 43 6 27
50 47 2 31 1 32 49 48
7 26 55 42 56 41 8 25
62 35 14 19 13 20 61 36
11 22 59 38 60 37 12 21 [Count = 46080]

```

As it is too big to print them out all, I could not but skip printing most. In the last part I made the list of 'C&C' MS88 instead of full forms.

We have got 46080 primitive solutions of developed ECO2<sup>6</sup> in various forms:

- (1) Developed forms  $8 \times 2^3$ ,
- (2) Self-complementary magic cubes of order  $4^3$  and magic squares of order  $8^2$ ,
- (3) Composite and complete magic cubes  $4^3$  and magic squares  $8^2$

When I examined the solution correspondence between the new list of 'C&C' type of MC444 and MS88 and the old one that I got before, I successfully certified that the new list is just the same with the old one.

#### #4. Discussion

Each 'Mother Set' has 46080 genuine 'primitive' solutions.

If you remove simple reflections and rotations of the same pattern, you will have got the smaller list of 'standard solutions' of 960 magic cubes(=  $46080 \div 48$ ), and 5760 magic squares(=  $46080 \div 8$ ). You may select them from the Mother Set by taking any appropriate 'list-forming inequality conditions'.

What does the result mean?

What types of magic forms tell the solution set of ECO2<sup>6</sup> is their 'origin'?

(1) Solutions of 'self-complementary' magic cubes of order  $4^3$  count far more than 960. It is only special type of them that counts 960, what includes multiple little cubes  $2 \times 2 \times 2$  of which every 4 numbers on each surface add up to 130.

(2) Solutions of 'self-complementary' magic squares of order  $8^2$  count far more than 5760 in general. It is only special type of them that counts 5760, what includes 4 little squares  $4 \times 4$  of which every row and column adds up to 130.

(3) It is the solution set of 'composite & complete' magic cubes  $4^3$  that counts just 960. Therefore ECO2<sup>6</sup> is supposed to be the 'origin' of those cubes. That is also certified by the test of correspondences between the new list and old one of 46080 primitive solutions beside 5760.

(4) Solutions of 'composite & complete' magic squares of order  $8^2$  count 368640, far more than 5760. It is only special type of them that counts 5760, what includes 4 little squares  $4 \times 4$  of which every row and column adds up to 130. ECO2<sup>6</sup> is supposed to be the 'origin' of those special MS88.

(5) What else counts 960 or 5760? I remember the 'three-type simultaneous' magic squares  $8^2$  has 5760 standard solutions: 'composite', 'pandiagonal' and 'self-complementary'. ECO2<sup>6</sup> is supposed to be the 'origin' of those special MS88. We want any appropriate 'model' solutions and method of 'DAM Transformation' be found so as to make the origin into these objects.

(Written in English on MacOS X & Xcode 1.5; May 11, 2005; Kanji Setsuda)

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