

Chapter 6 : Fundamental Studies of Higher-Dimensional Extra-Cubic Magic Objects and their Decompositions: Kanji Setsuda

Section 3-2 : 'Fundamental Solutions' and Transformation System of 'Composite & Complete' Magic Squares 8x8

#1. In the former sections we studied about 6-dimensional Extra-Cubic Magic Objects of order 2 and their decompositions. As a result we could have got the 15 fundamental solutions of 'C&C' magic Cubes of order 4 and the 10 fundamental solutions of 'C&C' magic Squares of order 8. They are extracted from the higher dimensional magic object by down-converting into lower dimensional ones.

But can we insist that they are really the 'Fundamental Solutions' of all 'C&C' magic cubes and squares? What evidences could we show for them?

We once examined whether the Prototype Solution Set and DAM Transformation System were applicable or not in this case. The result of our experiment was satisfactory. We found we could really re-construct all objects by transforming the Prototype Squares after the representative Model.

#2. But couldn't we have anything more direct and clearer to prove that they are true? Couldn't we really have such the method as direct transformation?

Yes. I want to demonstrate that we can really reconstruct all the many objects from the few Fundamental Solutions by some direct methods of transformation.

I want to find some simple rules of transformation, for instance, such as the ones I invented for the 3-dimensional 'C&C' Magic Cubes of order 4.

Now let's study and invent those kinds of direct method of transformation for our 2-dimensional 'C&C' Magic Squares of order 8 right here.

#3. The original source with which we have to start our job now is the Most Fundamental Ten Solutions as listed below.

** 'Composite & Complete' Magic Squares of Order 8 **
** The Most Fundamental 10 Solutions with Precise Check-Sums **

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1#|Row|C|m\PD1/PD2|Composite Fours
 1 63  6 60 38 28 33 31|260|260\260/260|130 130 130 130 130 130 130 130
62  4 57  7 25 39 30 36|260|260\260/260|130 130 130 130 130 130 130 130
11 53 16 50 48 18 43 21|260|260\260/260|130 130 130 130 130 130 130 130
56 10 51 13 19 45 24 42|260|260\260/260|130 130 130 130 130 130 130 130
27 37 32 34 64  2 59  5|260|260\260/260|130 130 130 130 130 130 130 130
40 26 35 29  3 61  8 58|260|260\260/260|130 130 130 130 130 130 130 130
17 47 22 44 54 12 49 15|260|260\260/260|130 130 130 130 130 130 130 130
46 20 41 23  9 55 14 52|260|260\260/260|130 130 130 130 130 130 130 130

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2#|Row|C|m\PD1/PD2|Composite Fours
 1 63  6 60 22 44 17 47|260|260\260/260|130 130 130 130 130 130 130 130
62  4 57  7 41 23 46 20|260|260\260/260|130 130 130 130 130 130 130 130
11 53 16 50 32 34 27 37|260|260\260/260|130 130 130 130 130 130 130 130
56 10 51 13 35 29 40 26|260|260\260/260|130 130 130 130 130 130 130 130
43 21 48 18 64  2 59  5|260|260\260/260|130 130 130 130 130 130 130 130
24 42 19 45  3 61  8 58|260|260\260/260|130 130 130 130 130 130 130 130
33 31 38 28 54 12 49 15|260|260\260/260|130 130 130 130 130 130 130 130
30 36 25 39  9 55 14 52|260|260\260/260|130 130 130 130 130 130 130 130

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3#|Row|C1m\PD1/PD2|Composite Fours

```

1 63 6 60 14 52 9 55|260|260\260/260|130 130 130 130 130 130 130 130
62 4 57 7 49 15 54 12|260|260\260/260|130 130 130 130 130 130 130 130
19 45 24 42 32 34 27 37|260|260\260/260|130 130 130 130 130 130 130 130
48 18 43 21 35 29 40 26|260|260\260/260|130 130 130 130 130 130 130 130
51 13 56 10 64 2 59 5|260|260\260/260|130 130 130 130 130 130 130 130
16 50 11 53 3 61 8 58|260|260\260/260|130 130 130 130 130 130 130 130
33 31 38 28 46 20 41 23|260|260\260/260|130 130 130 130 130 130 130 130
30 36 25 39 17 47 22 44|260|260\260/260|130 130 130 130 130 130 130 130

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4#|Row|C1m\PD1/PD2|Composite Fours

```

1 63 10 56 42 24 33 31|260|260\260/260|130 130 130 130 130 130 130 130
62 4 53 11 21 43 30 36|260|260\260/260|130 130 130 130 130 130 130 130
7 57 16 50 48 18 39 25|260|260\260/260|130 130 130 130 130 130 130 130
60 6 51 13 19 45 28 38|260|260\260/260|130 130 130 130 130 130 130 130
23 41 32 34 64 2 55 9|260|260\260/260|130 130 130 130 130 130 130 130
44 22 35 29 3 61 12 54|260|260\260/260|130 130 130 130 130 130 130 130
17 47 26 40 58 8 49 15|260|260\260/260|130 130 130 130 130 130 130 130
46 20 37 27 5 59 14 52|260|260\260/260|130 130 130 130 130 130 130 130

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5#|R|C\p|Composite Fours

```

1 63 10 56 26 40 17 47|0|0\0/0|0 0 0 0 0 0 0 0
62 4 53 11 37 27 46 20|0|0\0/0|0 0 0 0 0 0 0 0
7 57 16 50 32 34 23 41|0|0\0/0|0 0 0 0 0 0 0 0
60 6 51 13 35 29 44 22|0|0\0/0|0 0 0 0 0 0 0 0
39 25 48 18 64 2 55 9|0|0\0/0|0 0 0 0 0 0 0 0
28 38 19 45 3 61 12 54|0|0\0/0|0 0 0 0 0 0 0 0
33 31 42 24 58 8 49 15|0|0\0/0|0 0 0 0 0 0 0 0
30 36 21 43 5 59 14 52|0|0\0/0|0 0 0 0 0 0 0 0

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6#|R|C\p|Composite Fours

```

1 63 18 48 50 16 33 31|0|0\0/0|0 0 0 0 0 0 0 0
62 4 45 19 13 51 30 36|0|0\0/0|0 0 0 0 0 0 0 0
7 57 24 42 56 10 39 25|0|0\0/0|0 0 0 0 0 0 0 0
60 6 43 21 11 53 28 38|0|0\0/0|0 0 0 0 0 0 0 0
15 49 32 34 64 2 47 17|0|0\0/0|0 0 0 0 0 0 0 0
52 14 35 29 3 61 20 46|0|0\0/0|0 0 0 0 0 0 0 0
9 55 26 40 58 8 41 23|0|0\0/0|0 0 0 0 0 0 0 0
54 12 37 27 5 59 22 44|0|0\0/0|0 0 0 0 0 0 0 0

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7#|R|C\p|Composite Fours

```

1 63 4 62 36 30 33 31|0|0\0/0|0 0 0 0 0 0 0 0
60 6 57 7 25 39 28 38|0|0\0/0|0 0 0 0 0 0 0 0
13 51 16 50 48 18 45 19|0|0\0/0|0 0 0 0 0 0 0 0
56 10 53 11 21 43 24 42|0|0\0/0|0 0 0 0 0 0 0 0
29 35 32 34 64 2 61 3|0|0\0/0|0 0 0 0 0 0 0 0
40 26 37 27 5 59 8 58|0|0\0/0|0 0 0 0 0 0 0 0
17 47 20 46 52 14 49 15|0|0\0/0|0 0 0 0 0 0 0 0
44 22 41 23 9 55 12 54|0|0\0/0|0 0 0 0 0 0 0 0

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8#|R|C\p|Composite Fours

```

1 63 4 62 20 46 17 47|0|0\0/0|0 0 0 0 0 0 0 0
60 6 57 7 41 23 44 22|0|0\0/0|0 0 0 0 0 0 0 0
13 51 16 50 32 34 29 35|0|0\0/0|0 0 0 0 0 0 0 0
56 10 53 11 37 27 40 26|0|0\0/0|0 0 0 0 0 0 0 0
45 19 48 18 64 2 61 3|0|0\0/0|0 0 0 0 0 0 0 0
24 42 21 43 5 59 8 58|0|0\0/0|0 0 0 0 0 0 0 0
33 31 36 30 52 14 49 15|0|0\0/0|0 0 0 0 0 0 0 0
28 38 25 39 9 55 12 54|0|0\0/0|0 0 0 0 0 0 0 0

```

9#|R|C\p|Composite Fours

```

1 63 4 62 12 54 9 55|0|0\0/0|0 0 0 0 0 0 0 0
60 6 57 7 49 15 52 14|0|0\0/0|0 0 0 0 0 0 0 0
21 43 24 42 32 34 29 35|0|0\0/0|0 0 0 0 0 0 0 0
48 18 45 19 37 27 40 26|0|0\0/0|0 0 0 0 0 0 0 0
53 11 56 10 64 2 61 3|0|0\0/0|0 0 0 0 0 0 0 0
16 50 13 51 5 59 8 58|0|0\0/0|0 0 0 0 0 0 0 0
33 31 36 30 44 22 41 23|0|0\0/0|0 0 0 0 0 0 0 0
28 38 25 39 17 47 20 46|0|0\0/0|0 0 0 0 0 0 0 0

```

10#|R|C\p|Composite Fours

```

1 63 4 62 8 58 5 59|0|0\0/0|0 0 0 0 0 0 0 0
56 10 53 11 49 15 52 14|0|0\0/0|0 0 0 0 0 0 0 0
25 39 28 38 32 34 29 35|0|0\0/0|0 0 0 0 0 0 0 0
48 18 45 19 41 23 44 22|0|0\0/0|0 0 0 0 0 0 0 0
57 7 60 6 64 2 61 3|0|0\0/0|0 0 0 0 0 0 0 0
16 50 13 51 9 55 12 54|0|0\0/0|0 0 0 0 0 0 0 0
33 31 36 30 40 26 37 27|0|0\0/0|0 0 0 0 0 0 0 0
24 42 21 43 17 47 20 46|0|0\0/0|0 0 0 0 0 0 0 0

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[Count = 10] OK!

* Calculated and Listed by Kanji Setsuda on Oct.16, 2013 *

They are extracted from the 6-dimensional extra-cubic object of order 2, so that they naturally inherited some interesting properties from this origin:

```

n1 n2 n3 n4 n5 n6 n7 n8
n9 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
41 42 43 44 45 46 47 48
49 50 51 52 53 54 55 56
57 58 59 60 61 62 63 64

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n1+n2+n3+n4=130; n5+n6+n7+n8=130;
n1+n9+n17+n25=130; n33+n41+n49+n57=130;
n1=1; n37=64;
{n2, n4, n9, n21, n25, n35}
={32, 48, 56, 60, 62, 63}

```

They are naturally the 'multiple' type of 4 squares of order 4 included within.
 The numbers {63, 62, 60, 56, 48 and 32} could only appear next to the Origin $n1$ in { $n2$, $n4$, $n9$, $n21$, $n25$ and $n35$ } and couldn't come elsewhere.
 But $n21$ and $n35$ above look a little too strange, don't they?

**** Conceptual Diagrams of Transformation Transition(Part) ****

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

Though $n21$ and $n35$ are not on the axes, they are still waiting for appearing on the axes in their 'reserved seats'. It is because you can easily exchange $n21$ and $n57$ with each other, and also exchange $n35$ and $n8$ at any time you want to.
 We have already known that such the transformation types should be applicable to those positions as illustrated above.

#4. The final object goal we want to have should be the Standard 90 Solutions of 'Composite & Complete' Magic Squares of order 8 as listed below.

We want to reconstruct all these objects by transforming the Most Fundamental 10 solutions directly into them.

Could we really make these 90 solutions of 'C&C' MS88 presented below from those 10 solutions in the former list above? How could we transform each one of MF10 into the other 8 object solutions in the larger list below?

**** 'Composite & Complete' Magic Squares 8x8: List of the Standard 90 Solutions ****

1/F1								2/F2								3/								4/							
1	63	6	60	38	28	33	31	1	63	6	60	22	44	17	47	1	63	6	60	38	28	33	31	1	63	6	60	22	44	17	47
62	4	57	7	25	39	30	36	62	4	57	7	41	23	46	20	62	4	57	7	25	39	30	36	62	4	57	7	41	23	46	20
11	53	16	50	48	18	43	21	11	53	16	50	32	34	27	37	9	55	14	52	46	20	41	23	9	55	14	52	30	36	25	39
56	10	51	13	19	45	24	42	56	10	51	13	35	29	40	26	54	12	49	15	17	47	22	44	54	12	49	15	33	31	38	28
27	37	32	34	64	2	59	5	43	21	48	18	64	2	59	5	27	37	32	34	64	2	59	5	43	21	48	18	64	2	59	5
40	26	35	29	3	61	8	58	24	42	19	45	3	61	8	58	40	26	35	29	3	61	8	58	24	42	19	45	3	61	8	58
17	47	22	44	54	12	49	15	33	31	38	28	54	12	49	15	19	45	24	42	56	10	51	13	35	29	40	26	56	10	51	13
46	20	41	23	9	55	14	52	30	36	25	39	9	55	14	52	48	18	43	21	11	53	16	50	32	34	27	37	11	53	16	50

<p style="text-align: center;">5/F3</p> <p>1 63 6 60 14 52 9 55 62 4 57 7 49 15 54 12 19 45 24 42 32 34 27 37 48 18 43 21 35 29 40 26 51 13 56 10 64 2 59 5 16 50 11 53 3 61 8 58 33 31 38 28 46 20 41 23 30 36 25 39 17 47 22 44</p> <p style="text-align: center;">9/</p> <p>1 63 5 59 38 28 34 32 62 4 58 8 25 39 29 35 9 55 13 51 46 20 42 24 54 12 50 16 17 47 21 43 27 37 31 33 64 2 60 6 40 26 36 30 3 61 7 57 19 45 23 41 56 10 52 14 48 18 44 22 11 53 15 49</p> <p style="text-align: center;">13/F4</p> <p>1 63 10 56 42 24 33 31 62 4 53 11 21 43 30 36 7 57 16 50 48 18 39 25 60 6 51 13 19 45 28 38 23 41 32 34 64 2 55 9 44 22 35 29 3 61 12 54 17 47 26 40 58 8 49 15 46 20 37 27 5 59 14 52</p> <p style="text-align: center;">17/</p> <p>1 63 9 55 42 24 34 32 62 4 54 12 21 43 29 35 7 57 15 49 48 18 40 26 60 6 52 14 19 45 27 37 23 41 31 33 64 2 56 10 44 22 36 30 3 61 11 53 17 47 25 39 58 8 50 16 46 20 38 28 5 59 13 51</p> <p style="text-align: center;">21/F6</p> <p>1 63 18 48 50 16 33 31 62 4 45 19 13 51 30 36 7 57 24 42 56 10 39 25 60 6 43 21 11 53 28 38 15 49 32 34 64 2 47 17 52 14 35 29 3 61 20 46 9 55 26 40 58 8 41 23 54 12 37 27 5 59 22 44</p> <p style="text-align: center;">25/F7</p> <p>1 63 4 62 36 30 33 31 60 6 57 7 25 39 28 38 13 51 16 50 48 18 45 19 56 10 53 11 21 43 24 42 29 35 32 34 64 2 61 3 40 26 37 27 5 59 8 58 17 47 20 46 52 14 49 15 44 22 41 23 9 55 12 54</p> <p style="text-align: center;">29/F9</p> <p>1 63 4 62 12 54 9 55 60 6 57 7 49 15 52 14 21 43 24 42 32 34 29 35 48 18 45 19 37 27 40 26 53 11 56 10 64 2 61 3 16 50 13 51 5 59 8 58 33 31 36 30 44 22 41 23 28 38 25 39 17 47 20 46</p> <p style="text-align: center;">33/</p> <p>1 63 3 61 36 30 34 32 60 6 58 8 25 39 27 37 9 55 11 53 44 22 42 24 52 14 50 16 17 47 19 45 29 35 31 33 64 2 62 4</p>	<p style="text-align: center;">6/</p> <p>1 63 6 60 14 52 9 55 62 4 57 7 49 15 54 12 17 47 22 44 30 36 25 39 46 20 41 23 33 31 38 28 51 13 56 10 64 2 59 5 16 50 11 53 3 61 8 58 35 29 40 26 48 18 43 21 32 34 27 37 19 45 24 42</p> <p style="text-align: center;">10/</p> <p>1 63 5 59 22 44 18 48 62 4 58 8 41 23 45 19 9 55 13 51 30 36 26 40 54 12 50 16 33 31 37 27 43 21 47 17 64 2 60 6 24 42 20 46 3 61 7 57 35 29 39 25 56 10 52 14 32 34 28 38 11 53 15 49</p> <p style="text-align: center;">14/F5</p> <p>1 63 10 56 26 40 17 47 62 4 53 11 37 27 46 20 7 57 16 50 32 34 23 41 60 6 51 13 35 29 44 22 39 25 48 18 64 2 55 9 28 38 19 45 3 61 12 54 33 31 42 24 58 8 49 15 30 36 21 43 5 59 14 52</p> <p style="text-align: center;">18/</p> <p>1 63 9 55 26 40 18 48 62 4 54 12 37 27 45 19 7 57 15 49 32 34 24 42 60 6 52 14 35 29 43 21 39 25 47 17 64 2 56 10 28 38 20 46 3 61 11 53 33 31 41 23 58 8 50 16 30 36 22 44 5 59 13 51</p> <p style="text-align: center;">22/</p> <p>1 63 18 48 50 16 33 31 62 4 45 19 13 51 30 36 5 59 22 44 54 12 37 27 58 8 41 23 9 55 26 40 15 49 32 34 64 2 47 17 52 14 35 29 3 61 20 46 11 53 28 38 60 6 43 21 56 10 39 25 7 57 24 42</p> <p style="text-align: center;">26/F8</p> <p>1 63 4 62 20 46 17 47 60 6 57 7 41 23 44 22 13 51 16 50 32 34 29 35 56 10 53 11 37 27 40 26 45 19 48 18 64 2 61 3 24 42 21 43 5 59 8 58 33 31 36 30 52 14 49 15 28 38 25 39 9 55 12 54</p> <p style="text-align: center;">30/</p> <p>1 63 4 62 12 54 9 55 60 6 57 7 49 15 52 14 17 47 20 46 28 38 25 39 44 22 41 23 33 31 36 30 53 11 56 10 64 2 61 3 16 50 13 51 5 59 8 58 37 27 40 26 48 18 45 19 32 34 29 35 21 43 24 42</p> <p style="text-align: center;">34/</p> <p>1 63 3 61 20 46 18 48 60 6 58 8 41 23 43 21 9 55 11 53 28 38 26 40 52 14 50 16 33 31 35 29 45 19 47 17 64 2 62 4</p>	<p style="text-align: center;">7/</p> <p>1 63 5 59 38 28 34 32 62 4 58 8 25 39 29 35 11 53 15 49 48 18 44 22 56 10 52 14 19 45 23 41 27 37 31 33 64 2 60 6 40 26 36 30 3 61 7 57 17 47 21 43 54 12 50 16 46 20 42 24 9 55 13 51</p> <p style="text-align: center;">11/</p> <p>1 63 5 59 14 52 10 56 62 4 58 8 49 15 53 11 19 45 23 41 32 34 28 38 48 18 44 22 35 29 39 25 51 13 55 9 64 2 60 6 16 50 12 54 3 61 7 57 33 31 37 27 46 20 42 24 30 36 26 40 17 47 21 43</p> <p style="text-align: center;">15/</p> <p>1 63 10 56 42 24 33 31 62 4 53 11 21 43 30 36 5 59 14 52 46 20 37 27 58 8 49 15 17 47 26 40 23 41 32 34 64 2 55 9 44 22 35 29 3 61 12 54 19 45 28 38 60 6 51 13 48 18 39 25 7 57 16 50</p> <p style="text-align: center;">19/</p> <p>1 63 9 55 42 24 34 32 62 4 54 12 21 43 29 35 5 59 13 51 46 20 38 28 58 8 50 16 17 47 25 39 23 41 31 33 64 2 56 10 44 22 36 30 3 61 11 53 19 45 27 37 60 6 52 14 48 18 40 26 7 57 15 49</p> <p style="text-align: center;">23/</p> <p>1 63 17 47 50 16 34 32 62 4 46 20 13 51 29 35 7 57 23 41 56 10 40 26 60 6 44 22 11 53 27 37 15 49 31 33 64 2 48 18 52 14 36 30 3 61 19 45 9 55 25 39 58 8 42 24 54 12 38 28 5 59 21 43</p> <p style="text-align: center;">27/</p> <p>1 63 4 62 36 30 33 31 60 6 57 7 25 39 28 38 9 55 12 54 44 22 41 23 52 14 49 15 17 47 20 46 29 35 32 34 64 2 61 3 40 26 37 27 5 59 8 58 21 43 24 42 56 10 53 11 48 18 45 19 13 51 16 50</p> <p style="text-align: center;">31/</p> <p>1 63 3 61 36 30 34 32 60 6 58 8 25 39 27 37 13 51 15 49 48 18 46 20 56 10 54 12 21 43 23 41 29 35 31 33 64 2 62 4 40 26 38 28 5 59 7 57 17 47 19 45 52 14 50 16 44 22 42 24 9 55 11 53</p> <p style="text-align: center;">35/</p> <p>1 63 3 61 12 54 10 56 60 6 58 8 49 15 51 13 21 43 23 41 32 34 30 36 48 18 46 20 37 27 39 25 53 11 55 9 64 2 62 4</p>	<p style="text-align: center;">8/</p> <p>1 63 5 59 22 44 18 48 62 4 58 8 41 23 45 19 11 53 15 49 32 34 28 38 56 10 52 14 35 29 39 25 43 21 47 17 64 2 60 6 24 42 20 46 3 61 7 57 33 31 37 27 54 12 50 16 30 36 26 40 9 55 13 51</p> <p style="text-align: center;">12/</p> <p>1 63 5 59 14 52 10 56 62 4 58 8 49 15 53 11 17 47 21 43 30 36 26 40 46 20 42 24 33 31 37 27 51 13 55 9 64 2 60 6 16 50 12 54 3 61 7 57 35 29 39 25 48 18 44 22 32 34 28 38 19 45 23 41</p> <p style="text-align: center;">16/</p> <p>1 63 10 56 26 40 17 47 62 4 53 11 37 27 46 20 5 59 14 52 30 36 21 43 58 8 49 15 33 31 42 24 39 25 48 18 64 2 55 9 28 38 19 45 3 61 12 54 35 29 44 22 60 6 51 13 32 34 23 41 7 57 16 50</p> <p style="text-align: center;">20/</p> <p>1 63 9 55 26 40 18 48 62 4 54 12 37 27 45 19 5 59 13 51 30 36 22 44 58 8 50 16 33 31 41 23 39 25 47 17 64 2 56 10 28 38 20 46 3 61 11 53 35 29 43 21 60 6 52 14 32 34 24 42 7 57 15 49</p> <p style="text-align: center;">24/</p> <p>1 63 17 47 50 16 34 32 62 4 46 20 13 51 29 35 5 59 21 43 54 12 38 28 58 8 42 24 9 55 25 39 15 49 31 33 64 2 48 18 52 14 36 30 3 61 19 45 11 53 27 37 60 6 44 22 56 10 40 26 7 57 23 41</p> <p style="text-align: center;">28/</p> <p>1 63 4 62 20 46 17 47 60 6 57 7 41 23 44 22 9 55 12 54 28 38 25 39 52 14 49 15 33 31 36 30 45 19 48 18 64 2 61 3 24 42 21 43 5 59 8 58 37 27 40 26 56 10 53 11 32 34 29 35 13 51 16 50</p> <p style="text-align: center;">32/</p> <p>1 63 3 61 20 46 18 48 60 6 58 8 41 23 43 21 13 51 15 49 32 34 30 36 56 10 54 12 37 27 39 25 45 19 47 17 64 2 62 4 24 42 22 44 5 59 7 57 33 31 35 29 52 14 50 16 28 38 26 40 9 55 11 53</p> <p style="text-align: center;">36/</p> <p>1 63 3 61 12 54 10 56 60 6 58 8 49 15 51 13 17 47 19 45 28 38 26 40 44 22 42 24 33 31 35 29 53 11 55 9 64 2 62 4</p>
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40 26 38 28 5 59 7 57	24 42 22 44 5 59 7 57	16 50 14 52 5 59 7 57	16 50 14 52 5 59 7 57
21 43 23 41 56 10 54 12	37 27 39 25 56 10 54 12	33 31 35 29 44 22 42 24	37 27 39 25 48 18 46 20
48 18 46 20 13 51 15 49	32 34 30 36 13 51 15 49	28 38 26 40 17 47 19 45	32 34 30 36 21 43 23 41
	37/		40/
1 63 10 56 42 24 33 31	1 63 10 56 26 40 17 47	1 63 9 55 42 24 34 32	1 63 9 55 26 40 18 48
60 6 51 13 19 45 28 38	60 6 51 13 35 29 44 22	60 6 52 14 19 45 27 37	60 6 52 14 35 29 43 21
3 61 12 54 44 22 35 29	3 61 12 54 28 38 19 45	3 61 11 53 44 22 36 30	3 61 11 53 28 38 20 46
58 8 49 15 17 47 26 40	58 8 49 15 33 31 42 24	58 8 50 16 17 47 25 39	58 8 50 16 33 31 41 23
23 41 32 34 64 2 55 9	39 25 48 18 64 2 55 9	23 41 31 33 64 2 56 10	39 25 47 17 64 2 56 10
46 20 37 27 5 59 14 52	30 36 21 43 5 59 14 52	46 20 38 28 5 59 13 51	30 36 22 44 5 59 13 51
21 43 30 36 62 4 53 11	37 27 46 20 62 4 53 11	21 43 29 35 62 4 54 12	37 27 45 19 62 4 54 12
48 18 39 25 7 57 16 50	32 34 23 41 7 57 16 50	48 18 40 26 7 57 15 49	32 34 24 42 7 57 15 49
	41/		44/
1 63 18 48 50 16 33 31	1 63 17 47 50 16 34 32	1 63 4 62 36 30 33 31	1 63 4 62 20 46 17 47
60 6 43 21 11 53 28 38	60 6 44 22 11 53 27 37	56 10 53 11 21 43 24 42	56 10 53 11 37 27 40 26
3 61 20 46 52 14 35 29	3 61 19 45 52 14 36 30	5 59 8 58 40 26 37 27	5 59 8 58 24 42 21 43
58 8 41 23 9 55 26 40	58 8 42 24 9 55 25 39	52 14 49 15 17 47 20 46	52 14 49 15 33 31 36 30
15 49 32 34 64 2 47 17	15 49 31 33 64 2 48 18	29 35 32 34 64 2 61 3	45 19 48 18 64 2 61 3
54 12 37 27 5 59 22 44	54 12 38 28 5 59 21 43	44 22 41 23 9 55 12 54	28 38 25 39 9 55 12 54
13 51 30 36 62 4 45 19	13 51 29 35 62 4 46 20	25 39 28 38 60 6 57 7	41 23 44 22 60 6 57 7
56 10 39 25 7 57 24 42	56 10 40 26 7 57 23 41	48 18 45 19 13 51 16 50	32 34 29 35 13 51 16 50
	45/F10		47/
1 63 4 62 8 58 5 59	1 63 4 62 8 58 5 59	1 63 3 61 36 30 34 32	1 63 3 61 20 46 18 48
56 10 53 11 49 15 52 14	56 10 53 11 49 15 52 14	56 10 54 12 21 43 23 41	56 10 54 12 37 27 39 25
25 39 28 38 32 34 29 35	17 47 20 46 24 42 21 43	5 59 7 57 40 26 38 28	5 59 7 57 24 42 22 44
48 18 45 19 41 23 44 22	40 26 37 27 33 31 36 30	52 14 50 16 17 47 19 45	52 14 50 16 33 31 35 29
57 7 60 6 64 2 61 3	57 7 60 6 64 2 61 3	29 35 31 33 64 2 62 4	45 19 47 17 64 2 62 4
16 50 13 51 9 55 12 54	16 50 13 51 9 55 12 54	44 22 42 24 9 55 11 53	28 38 26 40 9 55 11 53
33 31 36 30 40 26 37 27	41 23 44 22 48 18 45 19	25 39 27 37 60 6 58 8	41 23 43 21 60 6 58 8
24 42 21 43 17 47 20 46	32 34 29 35 25 39 28 38	48 18 46 20 13 51 15 49	32 34 30 36 13 51 15 49
	46/		48/
1 63 3 61 8 58 6 60	1 63 3 61 8 58 6 60	1 63 6 60 38 28 33 31	1 63 6 60 22 44 17 47
56 10 54 12 49 15 51 13	56 10 54 12 49 15 51 13	56 10 51 13 19 45 24 42	56 10 51 13 35 29 40 26
25 39 27 37 32 34 30 36	17 47 19 45 24 42 22 44	3 61 8 58 40 26 35 29	3 61 8 58 24 42 19 45
48 18 46 20 41 23 43 21	40 26 38 28 33 31 35 29	54 12 49 15 17 47 22 44	54 12 49 15 33 31 38 28
57 7 59 5 64 2 62 4	57 7 59 5 64 2 62 4	27 37 32 34 64 2 59 5	43 21 48 18 64 2 59 5
16 50 14 52 9 55 11 53	16 50 14 52 9 55 11 53	46 20 41 23 9 55 14 52	30 36 25 39 9 55 14 52
33 31 35 29 40 26 38 28	41 23 43 21 48 18 46 20	25 39 30 36 62 4 57 7	41 23 46 20 62 4 57 7
24 42 22 44 17 47 19 45	32 34 30 36 25 39 27 37	48 18 43 21 11 53 16 50	32 34 27 37 11 53 16 50
	49/		51/
1 63 5 59 38 28 34 32	1 63 5 59 22 44 18 48	1 63 4 62 12 54 9 55	1 63 4 62 8 58 5 59
56 10 52 14 19 45 23 41	56 10 52 14 35 29 39 25	48 18 45 19 37 27 40 26	48 18 45 19 41 23 44 22
3 61 7 57 40 26 36 30	3 61 7 57 24 42 20 46	5 59 8 58 16 50 13 51	9 55 12 54 16 50 13 51
54 12 50 16 17 47 21 43	54 12 50 16 33 31 37 27	44 22 41 23 33 31 36 30	40 26 37 27 33 31 36 30
27 37 31 33 64 2 60 6	43 21 47 17 64 2 60 6	53 11 56 10 64 2 61 3	57 7 60 6 64 2 61 3
46 20 42 24 9 55 13 51	30 36 26 40 9 55 13 51	28 38 25 39 17 47 20 46	24 42 21 43 17 47 20 46
25 39 29 35 62 4 58 8	41 23 45 19 62 4 58 8	49 15 52 14 60 6 57 7	49 15 52 14 56 10 53 11
48 18 44 22 11 53 15 49	32 34 28 38 11 53 15 49	32 34 29 35 21 43 24 42	32 34 29 35 25 39 28 38
	53/		55/
1 63 3 61 12 54 10 56	1 63 3 61 8 58 6 60	1 63 6 60 14 52 9 55	1 63 5 59 14 52 10 56
48 18 46 20 37 27 39 25	48 18 46 20 41 23 43 21	48 18 43 21 35 29 40 26	48 18 44 22 35 29 39 25
5 59 7 57 16 50 14 52	9 55 11 53 16 50 14 52	3 61 8 58 16 50 11 53	3 61 7 57 16 50 12 54
44 22 42 24 33 31 35 29	40 26 38 28 33 31 35 29	46 20 41 23 33 31 38 28	46 20 42 24 33 31 37 27
53 11 55 9 64 2 62 4	57 7 59 5 64 2 62 4	51 13 56 10 64 2 59 5	51 13 55 9 64 2 60 6
28 38 26 40 17 47 19 45	24 42 22 44 17 47 19 45	30 36 25 39 17 47 22 44	30 36 26 40 17 47 21 43
49 15 51 13 60 6 58 8	49 15 51 13 56 10 54 12	49 15 54 12 62 4 57 7	49 15 53 11 62 4 58 8
32 34 30 36 21 43 23 41	32 34 30 36 25 39 27 37	32 34 27 37 19 45 24 42	32 34 28 38 19 45 23 41
	57/		59/
1 62 2 61 36 31 35 32	1 62 2 61 20 47 19 48	1 62 2 61 36 31 35 32	1 62 2 61 20 47 19 48
60 7 59 8 25 38 26 37	60 7 59 8 41 22 42 21	60 7 59 8 25 38 26 37	60 7 59 8 41 22 42 21
13 50 14 49 48 19 47 20	13 50 14 49 32 35 31 36	9 54 10 53 44 23 43 24	9 54 10 53 28 39 27 40
56 11 55 12 21 42 22 41	56 11 55 12 37 26 38 25	52 15 51 16 17 46 18 45	52 15 51 16 33 30 34 29
29 34 30 33 64 3 63 4	45 18 46 17 64 3 63 4	29 34 30 33 64 3 63 4	45 18 46 17 64 3 63 4
40 27 39 28 5 58 6 57	24 43 23 44 5 58 6 57	40 27 39 28 5 58 6 57	24 43 23 44 5 58 6 57
17 46 18 45 52 15 51 16	33 30 34 29 52 15 51 16	21 42 22 41 56 11 55 12	37 26 38 25 56 11 55 12
44 23 43 24 9 54 10 53	28 39 27 40 9 54 10 53	48 19 47 20 13 50 14 49	32 35 31 36 13 50 14 49
	61/		63/
1 62 2 61 12 55 11 56	1 62 2 61 12 55 11 56	1 62 11 56 43 24 33 30	1 62 11 56 27 40 17 46
60 7 59 8 49 14 50 13	60 7 59 8 49 14 50 13	60 7 50 13 18 45 28 39	60 7 50 13 34 29 44 23
	62/		64/
1 62 2 61 36 31 35 32	1 62 2 61 20 47 19 48	1 62 2 61 36 31 35 32	1 62 2 61 20 47 19 48
60 7 59 8 25 38 26 37	60 7 59 8 41 22 42 21	60 7 59 8 25 38 26 37	60 7 59 8 41 22 42 21
13 50 14 49 48 19 47 20	13 50 14 49 32 35 31 36	9 54 10 53 44 23 43 24	9 54 10 53 28 39 27 40
56 11 55 12 21 42 22 41	56 11 55 12 37 26 38 25	52 15 51 16 17 46 18 45	52 15 51 16 33 30 34 29
29 34 30 33 64 3 63 4	45 18 46 17 64 3 63 4	29 34 30 33 64 3 63 4	45 18 46 17 64 3 63 4
40 27 39 28 5 58 6 57	24 43 23 44 5 58 6 57	40 27 39 28 5 58 6 57	24 43 23 44 5 58 6 57
17 46 18 45 52 15 51 16	33 30 34 29 52 15 51 16	21 42 22 41 56 11 55 12	37 26 38 25 56 11 55 12
44 23 43 24 9 54 10 53	28 39 27 40 9 54 10 53	48 19 47 20 13 50 14 49	32 35 31 36 13 50 14 49
	65/		66/
1 62 2 61 12 55 11 56	1 62 2 61 12 55 11 56	1 62 11 56 43 24 33 30	1 62 11 56 27 40 17 46
60 7 59 8 49 14 50 13	60 7 59 8 49 14 50 13	60 7 50 13 18 45 28 39	60 7 50 13 34 29 44 23
	66/		68/
1 62 2 61 12 55 11 56	1 62 2 61 12 55 11 56	1 62 11 56 43 24 33 30	1 62 11 56 27 40 17 46
60 7 59 8 49 14 50 13	60 7 59 8 49 14 50 13	60 7 50 13 18 45 28 39	60 7 50 13 34 29 44 23

21 42 22 41 32 35 31 36	17 46 18 45 28 39 27 40	2 61 12 55 44 23 34 29	2 61 12 55 28 39 18 45
48 19 47 20 37 26 38 25	44 23 43 24 33 30 34 29	59 8 49 14 17 46 27 40	59 8 49 14 33 30 43 24
53 10 54 9 64 3 63 4	53 10 54 9 64 3 63 4	22 41 32 35 64 3 54 9	38 25 48 19 64 3 54 9
16 51 15 52 5 58 6 57	16 51 15 52 5 58 6 57	47 20 37 26 5 58 15 52	31 36 21 42 5 58 15 52
33 30 34 29 44 23 43 24	37 26 38 25 48 19 47 20	21 42 31 36 63 4 53 10	37 26 47 20 63 4 53 10
28 39 27 40 17 46 18 45	32 35 31 36 21 42 22 41	48 19 38 25 6 57 16 51	32 35 22 41 6 57 16 51
	69/	70/	71/
1 62 9 54 43 24 35 32	1 62 9 54 27 40 19 48	1 62 19 48 51 16 33 30	1 62 17 46 51 16 35 32
60 7 52 15 18 45 26 37	60 7 52 15 34 29 42 21	60 7 42 21 10 53 28 39	60 7 44 23 10 53 26 37
2 61 10 53 44 23 36 31	2 61 10 53 28 39 20 47	2 61 20 47 52 15 34 29	2 61 18 45 52 15 36 31
59 8 51 16 17 46 25 38	59 8 51 16 33 30 41 22	59 8 41 22 9 54 27 40	59 8 43 24 9 54 25 38
22 41 30 33 64 3 56 11	38 25 46 17 64 3 56 11	14 49 32 35 64 3 46 17	14 49 30 33 64 3 48 19
47 20 39 28 5 58 13 50	31 36 23 44 5 58 13 50	55 12 37 26 5 58 23 44	55 12 39 28 5 58 21 42
21 42 29 34 63 4 55 12	37 26 45 18 63 4 55 12	13 50 31 36 63 4 45 18	13 50 29 34 63 4 47 20
48 19 40 27 6 57 14 49	32 35 24 43 6 57 14 49	56 11 38 25 6 57 24 43	56 11 40 27 6 57 22 41
	73/	74/	75/
1 62 2 61 36 31 35 32	1 62 2 61 20 47 19 48	1 62 2 61 8 59 7 60	1 62 2 61 8 59 7 60
56 11 55 12 21 42 22 41	56 11 55 12 37 26 38 25	56 11 55 12 49 14 50 13	56 11 55 12 49 14 50 13
5 58 6 57 40 27 39 28	5 58 6 57 24 43 23 44	25 38 26 37 32 35 31 36	17 46 18 45 24 43 23 44
52 15 51 16 17 46 18 45	52 15 51 16 33 30 34 29	48 19 47 20 41 22 42 21	40 27 39 28 33 30 34 29
29 34 30 33 64 3 63 4	45 18 46 17 64 3 63 4	57 6 58 5 64 3 63 4	57 6 58 5 64 3 63 4
44 23 43 24 9 54 10 53	28 39 27 40 9 54 10 53	16 51 15 52 9 54 10 53	16 51 15 52 9 54 10 53
25 38 26 37 60 7 59 8	41 22 42 21 60 7 59 8	33 30 34 29 40 27 39 28	41 22 42 21 48 19 47 20
48 19 47 20 13 50 14 49	32 35 31 36 13 50 14 49	24 43 23 44 17 46 18 45	32 35 31 36 25 38 26 37
	77/	78/	79/
1 62 7 60 39 28 33 30	1 62 7 60 23 44 17 46	1 62 5 58 39 28 35 32	1 62 5 58 23 44 19 48
56 11 50 13 18 45 24 43	56 11 50 13 34 29 40 27	56 11 52 15 18 45 22 41	56 11 52 15 34 29 38 25
2 61 8 59 40 27 34 29	2 61 8 59 24 43 18 45	2 61 6 57 40 27 36 31	2 61 6 57 24 43 20 47
55 12 49 14 17 46 23 44	55 12 49 14 33 30 39 28	55 12 51 16 17 46 21 42	55 12 51 16 33 30 37 26
26 37 32 35 64 3 58 5	42 21 48 19 64 3 58 5	26 37 30 33 64 3 60 7	42 21 46 17 64 3 60 7
47 20 41 22 9 54 15 52	31 36 25 38 9 54 15 52	47 20 43 24 9 54 13 50	31 36 27 40 9 54 13 50
25 38 31 36 63 4 57 6	41 22 47 20 63 4 57 6	25 38 29 34 63 4 59 8	41 22 45 18 63 4 59 8
48 19 42 21 10 53 16 51	32 35 26 37 10 53 16 51	48 19 44 23 10 53 14 49	32 35 28 39 10 53 14 49
	81/	82/	83/
1 62 2 61 12 55 11 56	1 62 2 61 8 59 7 60	1 62 7 60 15 52 9 54	1 62 5 58 15 52 11 56
48 19 47 20 37 26 38 25	48 19 47 20 41 22 42 21	48 19 42 21 34 29 40 27	48 19 44 23 34 29 38 25
5 58 6 57 16 51 15 52	9 54 10 53 16 51 15 52	2 61 8 59 16 51 10 53	2 61 6 57 16 51 12 55
44 23 43 24 33 30 34 29	40 27 39 28 33 30 34 29	47 20 41 22 33 30 39 28	47 20 43 24 33 30 37 26
53 10 54 9 64 3 63 4	57 6 58 5 64 3 63 4	50 13 56 11 64 3 58 5	50 13 54 9 64 3 60 7
28 39 27 40 17 46 18 45	24 43 23 44 17 46 18 45	31 36 25 38 17 46 23 44	31 36 27 40 17 46 21 42
49 14 50 13 60 7 59 8	49 14 50 13 56 11 55 12	49 14 55 12 63 4 57 6	49 14 53 10 63 4 59 8
32 35 31 36 21 42 22 41	32 35 31 36 25 38 26 37	32 35 26 37 18 45 24 43	32 35 28 39 18 45 22 41
	85/	86/	87/
1 60 2 59 38 31 37 32	1 60 2 59 22 47 21 48	1 60 3 58 39 30 37 32	1 60 3 58 23 46 21 48
56 13 55 14 19 42 20 41	56 13 55 14 35 26 36 25	56 13 54 15 18 43 20 41	56 13 54 15 34 27 36 25
3 58 4 57 40 29 39 30	3 58 4 57 24 45 23 46	2 59 4 57 40 29 38 31	2 59 4 57 24 45 22 47
54 15 53 16 17 44 18 43	54 15 53 16 33 28 34 27	55 14 53 16 17 44 19 42	55 14 53 16 33 28 35 26
27 34 28 33 64 5 63 6	43 18 44 17 64 5 63 6	26 35 28 33 64 5 62 7	42 19 44 17 64 5 62 7
46 23 45 24 9 52 10 51	30 39 29 40 9 52 10 51	47 22 45 24 9 52 11 50	31 38 29 40 9 52 11 50
25 36 26 35 62 7 61 8	41 20 42 19 62 7 61 8	25 36 27 34 63 6 61 8	41 20 43 18 63 6 61 8
48 21 47 22 11 50 12 49	32 37 31 38 11 50 12 49	48 21 46 23 10 51 12 49	32 37 30 39 10 51 12 49
	89/	90/	
1 60 2 59 14 55 13 56	1 60 3 58 15 54 13 56		
48 21 47 22 35 26 36 25	48 21 46 23 34 27 36 25		
3 58 4 57 16 53 15 54	2 59 4 57 16 53 14 55		
46 23 45 24 33 28 34 27	47 22 45 24 33 28 35 26		
51 10 52 9 64 5 63 6	50 11 52 9 64 5 62 7		
30 39 29 40 17 44 18 43	31 38 29 40 17 44 19 42		
49 12 50 11 62 7 61 8	49 12 51 10 63 6 61 8		
32 37 31 38 19 42 20 41	32 37 30 39 18 43 20 41		

[n/Fn: Solution Number of S90/of MF10]

[Count = 90] OK!

** Calculated and Listed by Kanji Setsuda on
Sep.29, 2013 with MacOSX 10.8.5 & Xcode 5.0 **

#5. Let's classify these Standard 90 Solutions into 10 groups at first.

And we expect each group should have the only one representative solution of the Most Fundamental 10. It has to stand for the leading flag of its own group.

Let's pick up any 8 of 90 solutions next, compare and examine each of them to find how it is similar to the representative solution of the same group.

If you find many common elements between each pair, you can take it and classify into the same group. The more similarities between the two you could find, the better. At least half of all elements must be the same.

**** Find Similar Solutions to the Most Fundamental Ten ****
**** among the 90 Solutions of 'C&C' Magic Squares 8x8 ****

[1]

<pre> 1/ 1 63 6 60 38 28 33 31 62 4 57 7 25 39 30 36 11 53 16 50 48 18 43 21 56 10 51 13 19 45 24 42 27 37 32 34 64 2 59 5 40 26 35 29 3 61 8 58 17 47 22 44 54 12 49 15 46 20 41 23 9 55 14 52 </pre>	<pre> <-- No Difference --> * </pre>	<pre> 1/ 1 63 6 60 38 28 33 31 62 4 57 7 25 39 30 36 11 53 16 50 48 18 43 21 56 10 51 13 19 45 24 42 27 37 32 34 64 2 59 5 40 26 35 29 3 61 8 58 17 47 22 44 54 12 49 15 46 20 41 23 9 55 14 52 </pre>
<pre> 1/ 1 63 6 60 38 28 33 31 62 4 57 7 25 39 30 36 11 53 16 50 48 18 43 21 56 10 51 13 19 45 24 42 27 37 32 34 64 2 59 5 40 26 35 29 3 61 8 58 17 47 22 44 54 12 49 15 46 20 41 23 9 55 14 52 </pre>	<pre> <-- Difference --> * * * * 22 44 17 47 * * * * 41 23 46 20 * * * * 32 34 27 37 * * * * 35 29 40 26 43 21 48 18 * * * 24 42 19 45 * * * 33 31 38 28 * * * 30 36 25 39 * * * </pre>	<pre> 2/ 1 63 6 60 22 44 17 47 62 4 57 7 41 23 46 20 11 53 16 50 32 34 27 37 56 10 51 13 35 29 40 26 43 21 48 18 64 2 59 5 24 42 19 45 3 61 8 58 33 31 38 28 54 12 49 15 30 36 25 39 9 55 14 52 </pre>
<pre> 1/ 1 63 6 60 38 28 33 31 62 4 57 7 25 39 30 36 11 53 16 50 48 18 43 21 56 10 51 13 19 45 24 42 27 37 32 34 64 2 59 5 40 26 35 29 3 61 8 58 17 47 22 44 54 12 49 15 46 20 41 23 9 55 14 52 </pre>	<pre> <-- Difference --> * * * * * * * * * * 9 55 14 52 46 20 41 23 54 12 49 15 17 47 22 44 * * * * * * * * * * 19 45 24 42 56 10 51 13 48 18 43 21 11 53 16 50 </pre>	<pre> 3/ 1 63 6 60 38 28 33 31 62 4 57 7 25 39 30 36 9 55 14 52 46 20 41 23 54 12 49 15 17 47 22 44 27 37 32 34 64 2 59 5 40 26 35 29 3 61 8 58 19 45 24 42 56 10 51 13 48 18 43 21 11 53 16 50 </pre>
<pre> 1/ 1 63 6 60 38 28 33 31 62 4 57 7 25 39 30 36 11 53 16 50 48 18 43 21 56 10 51 13 19 45 24 42 27 37 32 34 64 2 59 5 40 26 35 29 3 61 8 58 17 47 22 44 54 12 49 15 46 20 41 23 9 55 14 52 </pre>	<pre> <-- Difference --> * * 5 59 * * 34 32 * * 58 8 * * 29 35 * * 15 49 * * 44 22 * * 52 14 * * 23 41 * * 31 33 * * 60 6 * * 36 30 * * 7 57 * * 21 43 * * 50 16 * * 42 24 * * 13 51 </pre>	<pre> 7/ 1 63 5 59 38 28 34 32 62 4 58 8 25 39 29 35 11 53 15 49 48 18 44 22 56 10 52 14 19 45 23 41 27 37 31 33 64 2 60 6 40 26 36 30 3 61 7 57 17 47 21 43 54 12 50 16 46 20 42 24 9 55 13 51 </pre>
<pre> 1/ 1 63 6 60 38 28 33 31 62 4 57 7 25 39 30 36 11 53 16 50 48 18 43 21 56 10 51 13 19 45 24 42 27 37 32 34 64 2 59 5 40 26 35 29 3 61 8 58 17 47 22 44 54 12 49 15 46 20 41 23 9 55 14 52 </pre>	<pre> <-- Difference --> * * 10 56 42 24 * * * * 53 11 21 43 * * 7 57 * * * * 39 25 60 6 * * * * 28 38 23 41 * * * * 55 9 44 22 * * * * 12 54 * * 26 40 58 8 * * * * 37 27 5 59 * * </pre>	<pre> 13/ 1 63 10 56 42 24 33 31 62 4 53 11 21 43 30 36 7 57 16 50 48 18 39 25 60 6 51 13 19 45 28 38 23 41 32 34 64 2 55 9 44 22 35 29 3 61 12 54 17 47 26 40 58 8 49 15 46 20 37 27 5 59 14 52 </pre>
<pre> 1/ 1 63 6 60 38 28 33 31 62 4 57 7 25 39 30 36 11 53 16 50 48 18 43 21 56 10 51 13 19 45 24 42 27 37 32 34 64 2 59 5 40 26 35 29 3 61 8 58 17 47 22 44 54 12 49 15 46 20 41 23 9 55 14 52 </pre>	<pre> <-- Difference --> * * 4 62 36 30 * * 60 6 * * * * 28 38 13 51 * * * * 45 19 * * 53 11 21 43 * * 29 35 * * * * 61 3 * * 37 27 5 59 * * * * 20 46 52 14 * * 44 22 * * * * 12 54 </pre>	<pre> 25/ 1 63 4 62 36 30 33 31 60 6 57 7 25 39 28 38 13 51 16 50 48 18 45 19 56 10 53 11 21 43 24 42 29 35 32 34 64 2 61 3 40 26 37 27 5 59 8 58 17 47 20 46 52 14 49 15 44 22 41 23 9 55 12 54 </pre>

The first pair happens to show that No.1 in the 90 Solution List is just the same with No.1 in the list of Fundamental 10. The next 3 pairs above are quite similar to each other. You may easily imagine how to transform each one into the other.

Let's collect No.1, 3 and 7 together into the same group led by 1/MF10.

But, let's not collect No.2, 13 and 25 here, for they are just the same with the 'flag solutions' of the other groups selected from the Most Fundamental 10.

[2]

2/	<-- Difference -->	1/
1 63 6 60 22 44 17 47	* * * * 38 28 33 31	1 63 6 60 38 28 33 31
62 4 57 7 41 23 46 20	* * * * 25 39 30 36	62 4 57 7 25 39 30 36
11 53 16 50 32 34 27 37	* * * * 48 18 43 21	11 53 16 50 48 18 43 21
56 10 51 13 35 29 40 26	* * * * 19 45 24 42	56 10 51 13 19 45 24 42
43 21 48 18 64 2 59 5	27 37 32 34 * * * *	27 37 32 34 64 2 59 5
24 42 19 45 3 61 8 58	40 26 35 29 * * * *	40 26 35 29 3 61 8 58
33 31 38 28 54 12 49 15	17 47 22 44 * * * *	17 47 22 44 54 12 49 15
30 36 25 39 9 55 14 52	46 20 41 23 * * * *	46 20 41 23 9 55 14 52
2/	<-- No Difference -->	2/
1 63 6 60 22 44 17 47	* * * * * * * *	1 63 6 60 22 44 17 47
62 4 57 7 41 23 46 20	* * * * * * * *	62 4 57 7 41 23 46 20
11 53 16 50 32 34 27 37	* * * * * * * *	11 53 16 50 32 34 27 37
56 10 51 13 35 29 40 26	* * * * * * * *	56 10 51 13 35 29 40 26
43 21 48 18 64 2 59 5	* * * * * * * *	43 21 48 18 64 2 59 5
24 42 19 45 3 61 8 58	* * * * * * * *	24 42 19 45 3 61 8 58
33 31 38 28 54 12 49 15	* * * * * * * *	33 31 38 28 54 12 49 15
30 36 25 39 9 55 14 52	* * * * * * * *	30 36 25 39 9 55 14 52
2/	<-- Difference -->	4/
1 63 6 60 22 44 17 47	* * * * * * * *	1 63 6 60 22 44 17 47
62 4 57 7 41 23 46 20	* * * * * * * *	62 4 57 7 41 23 46 20
11 53 16 50 32 34 27 37	9 55 14 52 30 36 25 39	9 55 14 52 30 36 25 39
56 10 51 13 35 29 40 26	54 12 49 15 33 31 38 28	54 12 49 15 33 31 38 28
43 21 48 18 64 2 59 5	* * * * * * * *	43 21 48 18 64 2 59 5
24 42 19 45 3 61 8 58	* * * * * * * *	24 42 19 45 3 61 8 58
33 31 38 28 54 12 49 15	35 29 40 26 56 10 51 13	35 29 40 26 56 10 51 13
30 36 25 39 9 55 14 52	32 34 27 37 11 53 16 50	32 34 27 37 11 53 16 50
2/	<-- Difference -->	5/
1 63 6 60 22 44 17 47	* * * * 14 52 9 55	1 63 6 60 14 52 9 55
62 4 57 7 41 23 46 20	* * * * 49 15 54 12	62 4 57 7 49 15 54 12
11 53 16 50 32 34 27 37	19 45 24 42 * * * *	19 45 24 42 32 34 27 37
56 10 51 13 35 29 40 26	48 18 43 21 * * * *	48 18 43 21 35 29 40 26
43 21 48 18 64 2 59 5	51 13 56 10 * * * *	51 13 56 10 64 2 59 5
24 42 19 45 3 61 8 58	16 50 11 53 * * * *	16 50 11 53 3 61 8 58
33 31 38 28 54 12 49 15	* * * * 46 20 41 23	33 31 38 28 46 20 41 23
30 36 25 39 9 55 14 52	* * * * 17 47 22 44	30 36 25 39 17 47 22 44
2/	<-- Difference -->	8/
1 63 6 60 22 44 17 47	* * 5 59 * * 18 48	1 63 5 59 22 44 18 48
62 4 57 7 41 23 46 20	* * 58 8 * * 45 19	62 4 58 8 41 23 45 19
11 53 16 50 32 34 27 37	* * 15 49 * * 28 38	11 53 15 49 32 34 28 38
56 10 51 13 35 29 40 26	* * 52 14 * * 39 25	56 10 52 14 35 29 39 25
43 21 48 18 64 2 59 5	* * 47 17 * * 60 6	43 21 47 17 64 2 60 6
24 42 19 45 3 61 8 58	* * 20 46 * * 7 57	24 42 20 46 3 61 7 57
33 31 38 28 54 12 49 15	* * 37 27 * * 50 16	33 31 37 27 54 12 50 16
30 36 25 39 9 55 14 52	* * 26 40 * * 13 51	30 36 26 40 9 55 13 51
2/	<-- Difference -->	14/
1 63 6 60 22 44 17 47	* * 10 56 26 40 * *	1 63 10 56 26 40 17 47
62 4 57 7 41 23 46 20	* * 53 11 37 27 * *	62 4 53 11 37 27 46 20
11 53 16 50 32 34 27 37	7 57 * * * * 23 41	7 57 16 50 32 34 23 41
56 10 51 13 35 29 40 26	60 6 * * * * 44 22	60 6 51 13 35 29 44 22
43 21 48 18 64 2 59 5	39 25 * * * * 55 9	39 25 48 18 64 2 55 9
24 42 19 45 3 61 8 58	28 38 * * * * 12 54	28 38 19 45 3 61 12 54
33 31 38 28 54 12 49 15	* * 42 24 58 8 * *	33 31 42 24 58 8 49 15
30 36 25 39 9 55 14 52	* * 21 43 5 59 * *	30 36 21 43 5 59 14 52


```

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

```

[3]

```

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

```

In the second group we want to collect No.2, 4 and 8 solutions above into the same group led by 2/MF10.

But let's not collect No.1, 5, 14 and 26 into this group, for they belong to the MF10 and are given priority to act as the flag leaders in their own groups.

It seems this simple method does not have enough power to collect so many members as 9 in each group. We must have any other additional transformations.

The next list below shows the result of my further comparison between the 90 solutions and the Child Generation of MF10 solutions.

```

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

                68/          <-- Replace -->          70/
1 62 11 56 27 40 17 46 * * 9 54 * * 19 48 1 62 9 54 27 40 19 48
60 7 50 13 34 29 44 23 * * 52 15 * * 42 21 60 7 52 15 34 29 42 21
2 61 12 55 28 39 18 45 * * 10 53 * * 20 47 2 61 10 53 28 39 20 47
59 8 49 14 33 30 43 24 * * 51 16 * * 41 22 59 8 51 16 33 30 41 22
38 25 48 19 64 3 54 9 * * 46 17 * * 56 11 38 25 46 17 64 3 56 11
31 36 21 42 5 58 15 52 * * 23 44 * * 13 50 31 36 23 44 5 58 13 50
37 26 47 20 63 4 53 10 * * 45 18 * * 55 12 37 26 45 18 63 4 55 12
32 35 22 41 6 57 16 51 * * 24 43 * * 14 49 32 35 24 43 6 57 14 49
. . .(skip). . .

```

```

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

```

```

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

```

```

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

```

Watch the following list below.

The 1/ of Father Generation is transformed into the 7/ of Child Generation.

And the 7/ is transformed into the 9/ of Grand-child Generation in the next pair.

The 3-rd Generation is transformed into the 4-th one in the following pair.

We need such the deeper method as follows to collect all the 9 members.

```

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

```

```

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

```

```

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

```

After all, I could collect what I have wanted.

Let me show you the fruitful result of my classification, only a part as below.

** Collect the Similar Solutions to the Fundamental 10 **
 ** and Make the 10 Groups of 9 Solutions of 'C&C' MS88 **

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

          3/          9/          70/
  1 63  6 60 38 28 33 31    1 63  5 59 38 28 34 32    1 62  9 54 27 40 19 48
 62  4 57  7 25 39 30 36    62  4 58  8 25 39 29 35    60  7 52 15 34 29 42 21
 9 55 14 52 46 20 41 23    9 55 13 51 46 20 42 24    2 61 10 53 28 39 20 47
54 12 49 15 17 47 22 44    54 12 50 16 17 47 21 43    59  8 51 16 33 30 41 22
27 37 32 34 64  2 59  5    27 37 31 33 64  2 60  6    38 25 46 17 64  3 56 11
40 26 35 29  3 61  8 58    40 26 36 30  3 61  7 57    31 36 23 44  5 58 13 50
19 45 24 42 56 10 51 13    19 45 23 41 56 10 52 14    37 26 45 18 63  4 55 12
48 18 43 21 11 53 16 50    48 18 44 22 11 53 15 49    32 35 24 43  6 57 14 49

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

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

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

. . .(skip). . .
```

If you watch the whole list of my classification, you will find neither duplication nor drop-off of any solution there.

Now that we could have got this list of 10 groups, I would say, we are almost close to our goal.

Then, let's study and know how to reconstruct the whole list of 10x9 solutions from the Fundamental 10 by our powerful method of transformations.

#6. How could we find and know how to transform each one of the Fundamental Ten into the other 8 solutions in the same group?

** Find Transformation System for the 10 Groups of **
 ** 9 Solutions of 'C&C' Magic Squares of Order 8 **

[Transform: Type 1]

1/	<-- Replace -->	7/
1 63 6 60 38 28 33 31	* * 5 59 * * 34 32	1 63 5 59 38 28 34 32
62 4 57 7 25 39 30 36	* * 58 8 * * 29 35	62 4 58 8 25 39 29 35
11 53 16 50 48 18 43 21	* * 15 49 * * 44 22	11 53 15 49 48 18 44 22
56 10 51 13 19 45 24 42	* * 52 14 * * 23 41	56 10 52 14 19 45 23 41
27 37 32 34 64 2 59 5	* * 31 33 * * 60 6	27 37 31 33 64 2 60 6
40 26 35 29 3 61 8 58	* * 36 30 * * 7 57	40 26 36 30 3 61 7 57
17 47 22 44 54 12 49 15	* * 21 43 * * 50 16	17 47 21 43 54 12 50 16
46 20 41 23 9 55 14 52	* * 42 24 * * 13 51	46 20 42 24 9 55 13 51
3/	<-- Replace -->	9/
1 63 6 60 38 28 33 31	* * 5 59 * * 34 32	1 63 5 59 38 28 34 32
62 4 57 7 25 39 30 36	* * 58 8 * * 29 35	62 4 58 8 25 39 29 35
9 55 14 52 46 20 41 23	* * 13 51 * * 42 24	9 55 13 51 46 20 42 24
54 12 49 15 17 47 22 44	* * 50 16 * * 21 43	54 12 50 16 17 47 21 43
27 37 32 34 64 2 59 5	* * 31 33 * * 60 6	27 37 31 33 64 2 60 6
40 26 35 29 3 61 8 58	* * 36 30 * * 7 57	40 26 36 30 3 61 7 57
19 45 24 42 56 10 51 13	* * 23 41 * * 52 14	19 45 23 41 56 10 52 14
48 18 43 21 11 53 16 50	* * 44 22 * * 15 49	48 18 44 22 11 53 15 49
51/	<-- Replace -->	53/
1 63 6 60 38 28 33 31	* * 5 59 * * 34 32	1 63 5 59 38 28 34 32
56 10 51 13 19 45 24 42	* * 52 14 * * 23 41	56 10 52 14 19 45 23 41
3 61 8 58 40 26 35 29	* * 7 57 * * 36 30	3 61 7 57 40 26 36 30
54 12 49 15 17 47 22 44	* * 50 16 * * 21 43	54 12 50 16 17 47 21 43
27 37 32 34 64 2 59 5	* * 31 33 * * 60 6	27 37 31 33 64 2 60 6
46 20 41 23 9 55 14 52	* * 42 24 * * 13 51	46 20 42 24 9 55 13 51
25 39 30 36 62 4 57 7	* * 29 35 * * 58 8	25 39 29 35 62 4 58 8
48 18 43 21 11 53 16 50	* * 44 22 * * 15 49	48 18 44 22 11 53 15 49
68/	<-- Replace -->	70/
1 62 11 56 27 40 17 46	* * 9 54 * * 19 48	1 62 9 54 27 40 19 48
60 7 50 13 34 29 44 23	* * 52 15 * * 42 21	60 7 52 15 34 29 42 21
2 61 12 55 28 39 18 45	* * 10 53 * * 20 47	2 61 10 53 28 39 20 47
59 8 49 14 33 30 43 24	* * 51 16 * * 41 22	59 8 51 16 33 30 41 22
38 25 48 19 64 3 54 9	* * 46 17 * * 56 11	38 25 46 17 64 3 56 11
31 36 21 42 5 58 15 52	* * 23 44 * * 13 50	31 36 23 44 5 58 13 50
37 26 47 20 63 4 53 10	* * 45 18 * * 55 12	37 26 45 18 63 4 55 12
32 35 22 41 6 57 16 51	* * 24 43 * * 14 49	32 35 24 43 6 57 14 49

[Transform: Type 2]

53/	<-- Replace -->	85/
1 63 5 59 38 28 34 32	* 60 2 * * 31 37 *	1 60 2 59 38 31 37 32
56 10 52 14 19 45 23 41	* 13 55 * * 42 20 *	56 13 55 14 19 42 20 41
3 61 7 57 40 26 36 30	* 58 4 * * 29 39 *	3 58 4 57 40 29 39 30
54 12 50 16 17 47 21 43	* 15 53 * * 44 18 *	54 15 53 16 17 44 18 43
27 37 31 33 64 2 60 6	* 34 28 * * 5 63 *	27 34 28 33 64 5 63 6
46 20 42 24 9 55 13 51	* 23 45 * * 52 10 *	46 23 45 24 9 52 10 51
25 39 29 35 62 4 58 8	* 36 26 * * 7 61 *	25 36 26 35 62 7 61 8
48 18 44 22 11 53 15 49	* 21 47 * * 50 12 *	48 21 47 22 11 50 12 49
54/	<-- Replace -->	86/
1 63 5 59 22 44 18 48	* 60 2 * * 47 21 *	1 60 2 59 22 47 21 48
56 10 52 14 35 29 39 25	* 13 55 * * 26 36 *	56 13 55 14 35 26 36 25
3 61 7 57 24 42 20 46	* 58 4 * * 45 23 *	3 58 4 57 24 45 23 46
54 12 50 16 33 31 37 27	* 15 53 * * 28 34 *	54 15 53 16 33 28 34 27
43 21 47 17 64 2 60 6	* 18 44 * * 5 63 *	43 18 44 17 64 5 63 6
30 36 26 40 9 55 13 51	* 39 29 * * 52 10 *	30 39 29 40 9 52 10 51
41 23 45 19 62 4 58 8	* 20 42 * * 7 61 *	41 20 42 19 62 7 61 8
32 34 28 38 11 53 15 49	* 37 31 * * 50 12 *	32 37 31 38 11 50 12 49

[Transform: Type 3]

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

[Transform: Type 4]

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

. . .(skip). . .

What we want to do here is to:

- (1) Pick up any possible pair combined out of 9 solutions in the same group and compare them to find where and how they are similar or different.
- (2) Collect every similar pairs in common among the 10 groups of 9 solutions.
- (3) Discover how to replace those common different parts between each pair.

In every group you can find the same kinds of pairs with common patterns.

Thus we could have picked up such the common rules of basic transformation as listed below, counting as many as 4 in all.

* Four Types of Transformation for the Fundamental 90 of 'C&C' MS88 *

[T1]	45/	<-- Replace -->	49/
1 63 4 62 8 58 5 59	* * 3 61 * * 6 60		1 63 3 61 8 58 6 60
56 10 53 11 49 15 52 14	* * 54 12 * * 51 13		56 10 54 12 49 15 51 13
25 39 28 38 32 34 29 35	* * 27 37 * * 30 36		25 39 27 37 32 34 30 36
48 18 45 19 41 23 44 22	* * 46 20 * * 43 21		48 18 46 20 41 23 43 21
57 7 60 6 64 2 61 3	* * 59 5 * * 62 4		57 7 59 5 64 2 62 4
16 50 13 51 9 55 12 54	* * 14 52 * * 11 53		16 50 14 52 9 55 11 53
33 31 36 30 40 26 37 27	* * 35 29 * * 38 28		33 31 35 29 40 26 38 28
24 42 21 43 17 47 20 46	* * 22 44 * * 19 45		24 42 22 44 17 47 19 45

```

[T2]                49/                <-- Replace -->                75/
  1 63  3 61  8 58  6 60  * 62  2  *  * 59  7  *   1 62  2 61  8 59  7 60
 56 10 54 12 49 15 51 13  * 11 55  *  * 14 50  *   56 11 55 12 49 14 50 13
25 39 27 37 32 34 30 36  * 38 26  *  * 35 31  *   25 38 26 37 32 35 31 36
48 18 46 20 41 23 43 21  * 19 47  *  * 22 42  *   48 19 47 20 41 22 42 21
57  7 59  5 64  2 62  4  *  6 58  *  *  3 63  *   57  6 58  5 64  3 63  4
16 50 14 52  9 55 11 53  * 51 15  *  * 54 10  *   16 51 15 52  9 54 10 53
33 31 35 29 40 26 38 28  * 30 34  *  * 27 39  *   33 30 34 29 40 27 39 28
24 42 22 44 17 47 19 45  * 43 23  *  * 46 18  *   24 43 23 44 17 46 18 45

[T3]                75/                <-- Replace -->                76/
  1 62  2 61  8 59  7 60  *  *  *  *  *  *  *  *   1 62  2 61  8 59  7 60
56 11 55 12 49 14 50 13  *  *  *  *  *  *  *  *   56 11 55 12 49 14 50 13
25 38 26 37 32 35 31 36 17 46 18 45 24 43 23 44 17 46 18 45 24 43 23 44
48 19 47 20 41 22 42 21 40 27 39 28 33 30 34 29 40 27 39 28 33 30 34 29
57  6 58  5 64  3 63  4  *  *  *  *  *  *  *  *   57  6 58  5 64  3 63  4
16 51 15 52  9 54 10 53  *  *  *  *  *  *  *  *   16 51 15 52  9 54 10 53
33 30 34 29 40 27 39 28 41 22 42 21 48 19 47 20 41 22 42 21 48 19 47 20
24 43 23 44 17 46 18 45 32 35 31 36 25 38 26 37 32 35 31 36 25 38 26 37

[T4]                46/                <-- Replace -->                56/
  1 63  4 62  8 58  5 59  *  *  *  *  *  *  *  *   1 63  4 62  8 58  5 59
56 10 53 11 49 15 52 14 48 18 45 19 41 23 44 22 48 18 45 19 41 23 44 22
17 47 20 46 24 42 21 43  9 55 12 54 16 50 13 51  9 55 12 54 16 50 13 51
40 26 37 27 33 31 36 30  *  *  *  *  *  *  *  *   40 26 37 27 33 31 36 30
57  7 60  6 64  2 61  3  *  *  *  *  *  *  *  *   57  7 60  6 64  2 61  3
16 50 13 51  9 55 12 54 24 42 21 43 17 47 20 46 24 42 21 43 17 47 20 46
41 23 44 22 48 18 45 19 49 15 52 14 56 10 53 11 49 15 52 14 56 10 53 11
32 34 29 35 25 39 28 38  *  *  *  *  *  *  *  *   32 34 29 35 25 39 28 38

```

We can now dictate such the program codes as below for each rule of these transformations, but I am going to present only two examples here.

If you want to see the whole list of my program, will you kindly come to the end of this article, please? You can find there all of what you want.

*** Transformation: Type 1 ***

```

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

```

```

void trans1(){
  qn[1]=pn[1];    qn[2]=pn[2];    qn[3]=pn[40];   qn[4]=pn[39];
  qn[5]=pn[5];    qn[6]=pn[6];    qn[7]=pn[36];   qn[8]=pn[35];
  qn[9]=pn[9];    qn[10]=pn[10];   qn[11]=pn[48];  qn[12]=pn[47];
  qn[13]=pn[13];  qn[14]=pn[14];   qn[15]=pn[44];  qn[16]=pn[43];
  qn[17]=pn[17];  qn[18]=pn[18];   qn[19]=pn[56];  qn[20]=pn[55];
  qn[21]=pn[21];  qn[22]=pn[22];   qn[23]=pn[52];  qn[24]=pn[51];
  qn[25]=pn[25];  qn[26]=pn[26];   qn[27]=pn[64];  qn[28]=pn[63];
  qn[29]=pn[29];  qn[30]=pn[30];   qn[31]=pn[60];  qn[32]=pn[59];
  qn[33]=pn[33];  qn[34]=pn[34];   qn[35]=pn[8];   qn[36]=pn[7];
  qn[37]=pn[37];  qn[38]=pn[38];   qn[39]=pn[4];   qn[40]=pn[3];
  qn[41]=pn[41];  qn[42]=pn[42];   qn[43]=pn[16];  qn[44]=pn[15];
  qn[45]=pn[45];  qn[46]=pn[46];   qn[47]=pn[12];  qn[48]=pn[11];
  qn[49]=pn[49];  qn[50]=pn[50];   qn[51]=pn[24];  qn[52]=pn[23];
  qn[53]=pn[53];  qn[54]=pn[54];   qn[55]=pn[20];  qn[56]=pn[19];
  qn[57]=pn[57];  qn[58]=pn[58];   qn[59]=pn[32];  qn[60]=pn[31];
  qn[61]=pn[61];  qn[62]=pn[62];   qn[63]=pn[28];  qn[64]=pn[27];
}

```

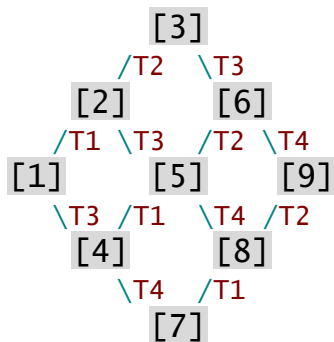
*** Transformation: Type 2 ***

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

```
void trans2(){
  qn[1]=pn[1];    qn[2]=pn[39];    qn[3]=pn[38];    qn[4]=pn[4];
  qn[5]=pn[5];    qn[6]=pn[35];    qn[7]=pn[34];    qn[8]=pn[8];
  qn[9]=pn[9];    qn[10]=pn[47];   qn[11]=pn[46];   qn[12]=pn[12];
  qn[13]=pn[13];  qn[14]=pn[43];   qn[15]=pn[42];   qn[16]=pn[16];
  qn[17]=pn[17];  qn[18]=pn[55];   qn[19]=pn[54];   qn[20]=pn[20];
  qn[21]=pn[21];  qn[22]=pn[51];   qn[23]=pn[50];   qn[24]=pn[24];
  qn[25]=pn[25];  qn[26]=pn[63];   qn[27]=pn[62];   qn[28]=pn[28];
  qn[29]=pn[29];  qn[30]=pn[59];   qn[31]=pn[58];   qn[32]=pn[32];
  qn[33]=pn[33];  qn[34]=pn[7];    qn[35]=pn[6];    qn[36]=pn[36];
  qn[37]=pn[37];  qn[38]=pn[3];    qn[39]=pn[2];    qn[40]=pn[40];
  qn[41]=pn[41];  qn[42]=pn[15];   qn[43]=pn[14];   qn[44]=pn[44];
  qn[45]=pn[45];  qn[46]=pn[11];   qn[47]=pn[10];   qn[48]=pn[48];
  qn[49]=pn[49];  qn[50]=pn[23];   qn[51]=pn[22];   qn[52]=pn[52];
  qn[53]=pn[53];  qn[54]=pn[19];   qn[55]=pn[18];   qn[56]=pn[56];
  qn[57]=pn[57];  qn[58]=pn[31];   qn[59]=pn[30];   qn[60]=pn[60];
  qn[61]=pn[61];  qn[62]=pn[27];   qn[63]=pn[26];   qn[64]=pn[64];
}
. . . (skip) . . .
```

#7. How do you apply these 4 types of transformation for our final job, then?
See the next diagram of 'Process Transition'.

**** Transition Diagram for Transformation ****



[n] stands for Solution Number in each Group.
'Tn' means Transformation Type.

It shows:

- You can transform [1] into [2] by the transformation Type 1; you can also transform [2] back into [1] by the Type 1;
- You can transform [2] into [3] by the Type 2; [3] back into [2] also by Type 2;
- You can transform [2] into [5] by the Type 3; [5] back into [2] also by Type 3;

You can transform [1] into [4] by the Type 3; [4] into [1] by the Type 3;
You can transform [4] into [7] by the Type 4; [7] into [4] by the Type 4;
.

Every transformation rules are essentially 'reversible'. If you can transform [m] into [n] by any method, then you can also transform [n] back into [m] by the same method.

It means the Transition Diagram above with these 4 reversible transformations can surely make you begin your job with any solution to be applied at first. You can also end your job with any one whichever you might choose.

And each group of 9 solutions has the same step transition in common.

Those 4 common rules of transformation above must be universally applied to every 10 groups of 9 solutions. It means there certainly is the only one 'common structure' among those 10 groups, as you know. How amazing it is!

But since we are now going to reconstruct S90 from MF10 in the actual case, we must always put each one of the MF10 on the top of group as a leader and begin with the very [1] at first.

I must add a special notice about the transformation types 2 and 4 in the end.

The result of those two types may sometimes conflict with the normalization standard of Standard Solutions: $n_2 > n_9$. When your result of transformation comes to appear $n_2 < n_9$, you must modify it by the 'Mirror Reflection' with respect to the first primary diagonal $\{n_1, n_{10}, n_{19}, n_{28}, \dots, n_{55}, n_{64}\}$ to realize $n_2 > n_9$.

I have prepared such the procedure "reflect" dictated as follows for the purpose of normalizing your answer forms.

```

/* Mirror Reflection *
void reflect(){
short n;
for(n=1;n<65;n++){qn[n]=pn[n];}
if(pn[9]>pn[2]){
qn[1]=pn[1];   qn[2]=pn[9];   qn[3]=pn[17];   qn[4]=pn[25];
qn[5]=pn[33];  qn[6]=pn[41];   qn[7]=pn[49];   qn[8]=pn[57];
qn[9]=pn[2];   qn[10]=pn[10];  qn[11]=pn[18];  qn[12]=pn[26];
qn[13]=pn[34]; qn[14]=pn[42];   qn[15]=pn[50];  qn[16]=pn[58];
qn[17]=pn[3];  qn[18]=pn[11];   qn[19]=pn[19];  qn[20]=pn[27];
qn[21]=pn[35]; qn[22]=pn[43];   qn[23]=pn[51];  qn[24]=pn[59];
qn[25]=pn[4];  qn[26]=pn[12];   qn[27]=pn[20];  qn[28]=pn[28];
qn[29]=pn[36]; qn[30]=pn[44];   qn[31]=pn[52];  qn[32]=pn[60];
qn[33]=pn[5];  qn[34]=pn[13];   qn[35]=pn[21];  qn[36]=pn[29];
qn[37]=pn[37]; qn[38]=pn[45];   qn[39]=pn[53];  qn[40]=pn[61];
qn[41]=pn[6];  qn[42]=pn[14];   qn[43]=pn[22];  qn[44]=pn[30];
qn[45]=pn[38]; qn[46]=pn[46];   qn[47]=pn[54];  qn[48]=pn[62];
qn[49]=pn[7];  qn[50]=pn[15];   qn[51]=pn[23];  qn[52]=pn[31];
qn[53]=pn[39]; qn[54]=pn[47];   qn[55]=pn[55];  qn[56]=pn[63];
qn[57]=pn[8];  qn[58]=pn[16];   qn[59]=pn[24];  qn[60]=pn[32];
qn[61]=pn[40]; qn[62]=pn[48];   qn[63]=pn[56];  qn[64]=pn[64];}
}

```

We now know how to transform each of MF10 into the other 8 different ones.

Repeat the same job of applying transformation to the other 9 Fundamental Solutions of their own 9 groups one after another.

#8. The next list below demonstrates the recent result of my reconstruction of S90 from MF10 by this new transformation system.

[n] means Group Name, m/n stand for Solution Numbers: Serial/Old;

[1]	1/ 1	2/ 7	3/68
1 63 6 60 38 28 33 31	1 63 5 59 38 28 34 32	1 62 11 56 27 40 17 46	
62 4 57 7 25 39 30 36	62 4 58 8 25 39 29 35	60 7 50 13 34 29 44 23	
11 53 16 50 48 18 43 21	11 53 15 49 48 18 44 22	2 61 12 55 28 39 18 45	
56 10 51 13 19 45 24 42	56 10 52 14 19 45 23 41	59 8 49 14 33 30 43 24	
27 37 32 34 64 2 59 5	27 37 31 33 64 2 60 6	38 25 48 19 64 3 54 9	
40 26 35 29 3 61 8 58	40 26 36 30 3 61 7 57	31 36 21 42 5 58 15 52	
17 47 22 44 54 12 49 15	17 47 21 43 54 12 50 16	37 26 47 20 63 4 53 10	
46 20 41 23 9 55 14 52	46 20 42 24 9 55 13 51	32 35 22 41 6 57 16 51	
	4/ 3	5/ 9	6/70
1 63 6 60 38 28 33 31	1 63 5 59 38 28 34 32	1 62 9 54 27 40 19 48	
62 4 57 7 25 39 30 36	62 4 58 8 25 39 29 35	60 7 52 15 34 29 42 21	
9 55 14 52 46 20 41 23	9 55 13 51 46 20 42 24	2 61 10 53 28 39 20 47	
54 12 49 15 17 47 22 44	54 12 50 16 17 47 21 43	59 8 51 16 33 30 41 22	
27 37 32 34 64 2 59 5	27 37 31 33 64 2 60 6	38 25 46 17 64 3 56 11	
40 26 35 29 3 61 8 58	40 26 36 30 3 61 7 57	31 36 23 44 5 58 13 50	
19 45 24 42 56 10 51 13	19 45 23 41 56 10 52 14	37 26 45 18 63 4 55 12	
48 18 43 21 11 53 16 50	48 18 44 22 11 53 15 49	32 35 24 43 6 57 14 49	

	7/51		8/53		9/85
	1 63 6 60 38 28 33 31		1 63 5 59 38 28 34 32		1 60 2 59 38 31 37 32
	56 10 51 13 19 45 24 42		56 10 52 14 19 45 23 41		56 13 55 14 19 42 20 41
	3 61 8 58 40 26 35 29		3 61 7 57 40 26 36 30		3 58 4 57 40 29 39 30
	54 12 49 15 17 47 22 44		54 12 50 16 17 47 21 43		54 15 53 16 17 44 18 43
	27 37 32 34 64 2 59 5		27 37 31 33 64 2 60 6		27 34 28 33 64 5 63 6
	46 20 41 23 9 55 14 52		46 20 42 24 9 55 13 51		46 23 45 24 9 52 10 51
	25 39 30 36 62 4 57 7		25 39 29 35 62 4 58 8		25 36 26 35 62 7 61 8
	48 18 43 21 11 53 16 50		48 18 44 22 11 53 15 49		48 21 47 22 11 50 12 49
[2]	10/ 2		11/ 8		12/67
	1 63 6 60 22 44 17 47		1 63 5 59 22 44 18 48		1 62 11 56 43 24 33 30
	62 4 57 7 41 23 46 20		62 4 58 8 41 23 45 19		60 7 50 13 18 45 28 39
	11 53 16 50 32 34 27 37		11 53 15 49 32 34 28 38		2 61 12 55 44 23 34 29
	56 10 51 13 35 29 40 26		56 10 52 14 35 29 39 25		59 8 49 14 17 46 27 40
	43 21 48 18 64 2 59 5		43 21 47 17 64 2 60 6		22 41 32 35 64 3 54 9
	24 42 19 45 3 61 8 58		24 42 20 46 3 61 7 57		47 20 37 26 5 58 15 52
	33 31 38 28 54 12 49 15		33 31 37 27 54 12 50 16		21 42 31 36 63 4 53 10
	30 36 25 39 9 55 14 52		30 36 26 40 9 55 13 51		48 19 38 25 6 57 16 51
	13/ 4		14/10		15/69
	1 63 6 60 22 44 17 47		1 63 5 59 22 44 18 48		1 62 9 54 43 24 35 32
	62 4 57 7 41 23 46 20		62 4 58 8 41 23 45 19		60 7 52 15 18 45 26 37
	9 55 14 52 30 36 25 39		9 55 13 51 30 36 26 40		2 61 10 53 44 23 36 31
	54 12 49 15 33 31 38 28		54 12 50 16 33 31 37 27		59 8 51 16 17 46 25 38
	43 21 48 18 64 2 59 5		43 21 47 17 64 2 60 6		22 41 30 33 64 3 56 11
	24 42 19 45 3 61 8 58		24 42 20 46 3 61 7 57		47 20 39 28 5 58 13 50
	35 29 40 26 56 10 51 13		35 29 39 25 56 10 52 14		21 42 29 34 63 4 55 12
	32 34 27 37 11 53 16 50		32 34 28 38 11 53 15 49		48 19 40 27 6 57 14 49
	16/52		17/54		18/86
	1 63 6 60 22 44 17 47		1 63 5 59 22 44 18 48		1 60 2 59 22 47 21 48
	56 10 51 13 35 29 40 26		56 10 52 14 35 29 39 25		56 13 55 14 35 26 36 25
	3 61 8 58 24 42 19 45		3 61 7 57 24 42 20 46		3 58 4 57 24 45 23 46
	54 12 49 15 33 31 38 28		54 12 50 16 33 31 37 27		54 15 53 16 33 28 34 27
	43 21 48 18 64 2 59 5		43 21 47 17 64 2 60 6		43 18 44 17 64 5 63 6
	30 36 25 39 9 55 14 52		30 36 26 40 9 55 13 51		30 39 29 40 9 52 10 51
	41 23 46 20 62 4 57 7		41 23 45 19 62 4 58 8		41 20 42 19 62 7 61 8
	32 34 27 37 11 53 16 50		32 34 28 38 11 53 15 49		32 37 31 38 11 50 12 49
[3]	19/ 5		20/11		21/71
	1 63 6 60 14 52 9 55		1 63 5 59 14 52 10 56		1 62 19 48 51 16 33 30
	62 4 57 7 49 15 54 12		62 4 58 8 49 15 53 11		60 7 42 21 10 53 28 39
	19 45 24 42 32 34 27 37		19 45 23 41 32 34 28 38		2 61 20 47 52 15 34 29
	48 18 43 21 35 29 40 26		48 18 44 22 35 29 39 25		59 8 41 22 9 54 27 40
	51 13 56 10 64 2 59 5		51 13 55 9 64 2 60 6		14 49 32 35 64 3 46 17
	16 50 11 53 3 61 8 58		16 50 12 54 3 61 7 57		55 12 37 26 5 58 23 44
	33 31 38 28 46 20 41 23		33 31 37 27 46 20 42 24		13 50 31 36 63 4 45 18
	30 36 25 39 17 47 22 44		30 36 26 40 17 47 21 43		56 11 38 25 6 57 24 43
	22/ 6		23/12		24/72
	1 63 6 60 14 52 9 55		1 63 5 59 14 52 10 56		1 62 17 46 51 16 35 32
	62 4 57 7 49 15 54 12		62 4 58 8 49 15 53 11		60 7 44 23 10 53 26 37
	17 47 22 44 30 36 25 39		17 47 21 43 30 36 26 40		2 61 18 45 52 15 36 31
	46 20 41 23 33 31 38 28		46 20 42 24 33 31 37 27		59 8 43 24 9 54 25 38
	51 13 56 10 64 2 59 5		51 13 55 9 64 2 60 6		14 49 30 33 64 3 48 19
	16 50 11 53 3 61 8 58		16 50 12 54 3 61 7 57		55 12 39 28 5 58 21 42
	35 29 40 26 48 18 43 21		35 29 39 25 48 18 44 22		13 50 29 34 63 4 47 20
	32 34 27 37 19 45 24 42		32 34 28 38 19 45 23 41		56 11 40 27 6 57 22 41
	25/59		26/60		27/89
	1 63 6 60 14 52 9 55		1 63 5 59 14 52 10 56		1 60 2 59 14 55 13 56
	48 18 43 21 35 29 40 26		48 18 44 22 35 29 39 25		48 21 47 22 35 26 36 25
	3 61 8 58 16 50 11 53		3 61 7 57 16 50 12 54		3 58 4 57 16 53 15 54
	46 20 41 23 33 31 38 28		46 20 42 24 33 31 37 27		46 23 45 24 33 28 34 27
	51 13 56 10 64 2 59 5		51 13 55 9 64 2 60 6		51 10 52 9 64 5 63 6
	30 36 25 39 17 47 22 44		30 36 26 40 17 47 21 43		30 39 29 40 17 44 18 43
	49 15 54 12 62 4 57 7		49 15 53 11 62 4 58 8		49 12 50 11 62 7 61 8
	32 34 27 37 19 45 24 42		32 34 28 38 19 45 23 41		32 37 31 38 19 42 20 41

[4]	28/13	29/17	30/78
1 63 10 56 42 24 33 31	1 63 9 55 42 24 34 32	1 62 7 60 23 44 17 46	
62 4 53 11 21 43 30 36	62 4 54 12 21 43 29 35	56 11 50 13 34 29 40 27	
7 57 16 50 48 18 39 25	7 57 15 49 48 18 40 26	2 61 8 59 24 43 18 45	
60 6 51 13 19 45 28 38	60 6 52 14 19 45 27 37	55 12 49 14 33 30 39 28	
23 41 32 34 64 2 55 9	23 41 31 33 64 2 56 10	42 21 48 19 64 3 58 5	
44 22 35 29 3 61 12 54	44 22 36 30 3 61 11 53	31 36 25 38 9 54 15 52	
17 47 26 40 58 8 49 15	17 47 25 39 58 8 50 16	41 22 47 20 63 4 57 6	
46 20 37 27 5 59 14 52	46 20 38 28 5 59 13 51	32 35 26 37 10 53 16 51	
	31/15	32/19	33/80
1 63 10 56 42 24 33 31	1 63 9 55 42 24 34 32	1 62 5 58 23 44 19 48	
62 4 53 11 21 43 30 36	62 4 54 12 21 43 29 35	56 11 52 15 34 29 38 25	
5 59 14 52 46 20 37 27	5 59 13 51 46 20 38 28	2 61 6 57 24 43 20 47	
58 8 49 15 17 47 26 40	58 8 50 16 17 47 25 39	55 12 51 16 33 30 37 26	
23 41 32 34 64 2 55 9	23 41 31 33 64 2 56 10	42 21 46 17 64 3 60 7	
44 22 35 29 3 61 12 54	44 22 36 30 3 61 11 53	31 36 27 40 9 54 13 50	
19 45 28 38 60 6 51 13	19 45 27 37 60 6 52 14	41 22 45 18 63 4 59 8	
48 18 39 25 7 57 16 50	48 18 40 26 7 57 15 49	32 35 28 39 10 53 14 49	
	34/37	35/39	36/88
1 63 10 56 42 24 33 31	1 63 9 55 42 24 34 32	1 60 3 58 23 46 21 48	
60 6 51 13 19 45 28 38	60 6 52 14 19 45 27 37	56 13 54 15 34 27 36 25	
3 61 12 54 44 22 35 29	3 61 11 53 44 22 36 30	2 59 4 57 24 45 22 47	
58 8 49 15 17 47 26 40	58 8 50 16 17 47 25 39	55 14 53 16 33 28 35 26	
23 41 32 34 64 2 55 9	23 41 31 33 64 2 56 10	42 19 44 17 64 5 62 7	
46 20 37 27 5 59 14 52	46 20 38 28 5 59 13 51	31 38 29 40 9 52 11 50	
21 43 30 36 62 4 53 11	21 43 29 35 62 4 54 12	41 20 43 18 63 6 61 8	
48 18 39 25 7 57 16 50	48 18 40 26 7 57 15 49	32 37 30 39 10 51 12 49	
[5]	37/14	38/18	39/77
1 63 10 56 26 40 17 47	1 63 9 55 26 40 18 48	1 62 7 60 39 28 33 30	
62 4 53 11 37 27 46 20	62 4 54 12 37 27 45 19	56 11 50 13 18 45 24 43	
7 57 16 50 32 34 23 41	7 57 15 49 32 34 24 42	2 61 8 59 40 27 34 29	
60 6 51 13 35 29 44 22	60 6 52 14 35 29 43 21	55 12 49 14 17 46 23 44	
39 25 48 18 64 2 55 9	39 25 47 17 64 2 56 10	26 37 32 35 64 3 58 5	
28 38 19 45 3 61 12 54	28 38 20 46 3 61 11 53	47 20 41 22 9 54 15 52	
33 31 42 24 58 8 49 15	33 31 41 23 58 8 50 16	25 38 31 36 63 4 57 6	
30 36 21 43 5 59 14 52	30 36 22 44 5 59 13 51	48 19 42 21 10 53 16 51	
	40/16	41/20	42/79
1 63 10 56 26 40 17 47	1 63 9 55 26 40 18 48	1 62 5 58 39 28 35 32	
62 4 53 11 37 27 46 20	62 4 54 12 37 27 45 19	56 11 52 15 18 45 22 41	
5 59 14 52 30 36 21 43	5 59 13 51 30 36 22 44	2 61 6 57 40 27 36 31	
58 8 49 15 33 31 42 24	58 8 50 16 33 31 41 23	55 12 51 16 17 46 21 42	
39 25 48 18 64 2 55 9	39 25 47 17 64 2 56 10	26 37 30 33 64 3 60 7	
28 38 19 45 3 61 12 54	28 38 20 46 3 61 11 53	47 20 43 24 9 54 13 50	
35 29 44 22 60 6 51 13	35 29 43 21 60 6 52 14	25 38 29 34 63 4 59 8	
32 34 23 41 7 57 16 50	32 34 24 42 7 57 15 49	48 19 44 23 10 53 14 49	
	43/38	44/40	45/87
1 63 10 56 26 40 17 47	1 63 9 55 26 40 18 48	1 60 3 58 39 30 37 32	
60 6 51 13 35 29 44 22	60 6 52 14 35 29 43 21	56 13 54 15 18 43 20 41	
3 61 12 54 28 38 19 45	3 61 11 53 28 38 20 46	2 59 4 57 40 29 38 31	
58 8 49 15 33 31 42 24	58 8 50 16 33 31 41 23	55 14 53 16 17 44 19 42	
39 25 48 18 64 2 55 9	39 25 47 17 64 2 56 10	26 35 28 33 64 5 62 7	
30 36 21 43 5 59 14 52	30 36 22 44 5 59 13 51	47 22 45 24 9 52 11 50	
37 27 46 20 62 4 53 11	37 27 45 19 62 4 54 12	25 36 27 34 63 6 61 8	
32 34 23 41 7 57 16 50	32 34 24 42 7 57 15 49	48 21 46 23 10 51 12 49	
[6]	46/21	47/23	48/83
1 63 18 48 50 16 33 31	1 63 17 47 50 16 34 32	1 62 7 60 15 52 9 54	
62 4 45 19 13 51 30 36	62 4 46 20 13 51 29 35	48 19 42 21 34 29 40 27	
7 57 24 42 56 10 39 25	7 57 23 41 56 10 40 26	2 61 8 59 16 51 10 53	
60 6 43 21 11 53 28 38	60 6 44 22 11 53 27 37	47 20 41 22 33 30 39 28	
15 49 32 34 64 2 47 17	15 49 31 33 64 2 48 18	50 13 56 11 64 3 58 5	
52 14 35 29 3 61 20 46	52 14 36 30 3 61 19 45	31 36 25 38 17 46 23 44	
9 55 26 40 58 8 41 23	9 55 25 39 58 8 42 24	49 14 55 12 63 4 57 6	
54 12 37 27 5 59 22 44	54 12 38 28 5 59 21 43	32 35 26 37 18 45 24 43	

	49/22		50/24		51/84																		
1	63	18	48	50	16	33	31	1	63	17	47	50	16	34	32	1	62	5	58	15	52	11	56
62	4	45	19	13	51	30	36	62	4	46	20	13	51	29	35	48	19	44	23	34	29	38	25
5	59	22	44	54	12	37	27	5	59	21	43	54	12	38	28	2	61	6	57	16	51	12	55
58	8	41	23	9	55	26	40	58	8	42	24	9	55	25	39	47	20	43	24	33	30	37	26
15	49	32	34	64	2	47	17	15	49	31	33	64	2	48	18	50	13	54	9	64	3	60	7
52	14	35	29	3	61	20	46	52	14	36	30	3	61	19	45	31	36	27	40	17	46	21	42
11	53	28	38	60	6	43	21	11	53	27	37	60	6	44	22	49	14	53	10	63	4	59	8
56	10	39	25	7	57	24	42	56	10	40	26	7	57	23	41	32	35	28	39	18	45	22	41
	52/41		53/42		54/90																		
1	63	18	48	50	16	33	31	1	63	17	47	50	16	34	32	1	60	3	58	15	54	13	56
60	6	43	21	11	53	28	38	60	6	44	22	11	53	27	37	48	21	46	23	34	27	36	25
3	61	20	46	52	14	35	29	3	61	19	45	52	14	36	30	2	59	4	57	16	53	14	55
58	8	41	23	9	55	26	40	58	8	42	24	9	55	25	39	47	22	45	24	33	28	35	26
15	49	32	34	64	2	47	17	15	49	31	33	64	2	48	18	50	11	52	9	64	5	62	7
54	12	37	27	5	59	22	44	54	12	38	28	5	59	21	43	31	38	29	40	17	44	19	42
13	51	30	36	62	4	45	19	13	51	29	35	62	4	46	20	49	12	51	10	63	6	61	8
56	10	39	25	7	57	24	42	56	10	40	26	7	57	23	41	32	37	30	39	18	43	20	41
[7]	55/25		56/31		57/61																		
1	63	4	62	36	30	33	31	1	63	3	61	36	30	34	32	1	62	2	61	36	31	35	32
60	6	57	7	25	39	28	38	60	6	58	8	25	39	27	37	60	7	59	8	25	38	26	37
13	51	16	50	48	18	45	19	13	51	15	49	48	18	46	20	13	50	14	49	48	19	47	20
56	10	53	11	21	43	24	42	56	10	54	12	21	43	23	41	56	11	55	12	21	42	22	41
29	35	32	34	64	2	61	3	29	35	31	33	64	2	62	4	29	34	30	33	64	3	63	4
40	26	37	27	5	59	8	58	40	26	38	28	5	59	7	57	40	27	39	28	5	58	6	57
17	47	20	46	52	14	49	15	17	47	19	45	52	14	50	16	17	46	18	45	52	15	51	16
44	22	41	23	9	55	12	54	44	22	42	24	9	55	11	53	44	23	43	24	9	54	10	53
	58/27		59/33		60/63																		
1	63	4	62	36	30	33	31	1	63	3	61	36	30	34	32	1	62	2	61	36	31	35	32
60	6	57	7	25	39	28	38	60	6	58	8	25	39	27	37	60	7	59	8	25	38	26	37
9	55	12	54	44	22	41	23	9	55	11	53	44	22	42	24	9	54	10	53	44	23	43	24
52	14	49	15	17	47	20	46	52	14	50	16	17	47	19	45	52	15	51	16	17	46	18	45
29	35	32	34	64	2	61	3	29	35	31	33	64	2	62	4	29	34	30	33	64	3	63	4
40	26	37	27	5	59	8	58	40	26	38	28	5	59	7	57	40	27	39	28	5	58	6	57
21	43	24	42	56	10	53	11	21	43	23	41	56	10	54	12	21	42	22	41	56	11	55	12
48	18	45	19	13	51	16	50	48	18	46	20	13	51	15	49	48	19	47	20	13	50	14	49
	61/43		62/47		63/73																		
1	63	4	62	36	30	33	31	1	63	3	61	36	30	34	32	1	62	2	61	36	31	35	32
56	10	53	11	21	43	24	42	56	10	54	12	21	43	23	41	56	11	55	12	21	42	22	41
5	59	8	58	40	26	37	27	5	59	7	57	40	26	38	28	5	58	6	57	40	27	39	28
52	14	49	15	17	47	20	46	52	14	50	16	17	47	19	45	52	15	51	16	17	46	18	45
29	35	32	34	64	2	61	3	29	35	31	33	64	2	62	4	29	34	30	33	64	3	63	4
44	22	41	23	9	55	12	54	44	22	42	24	9	55	11	53	44	23	43	24	9	54	10	53
25	39	28	38	60	6	57	7	25	39	27	37	60	6	58	8	25	38	26	37	60	7	59	8
48	18	45	19	13	51	16	50	48	18	46	20	13	51	15	49	48	19	47	20	13	50	14	49
[8]	64/26		65/32		66/62																		
1	63	4	62	20	46	17	47	1	63	3	61	20	46	18	48	1	62	2	61	20	47	19	48
60	6	57	7	41	23	44	22	60	6	58	8	41	23	43	21	60	7	59	8	41	22	42	21
13	51	16	50	32	34	29	35	13	51	15	49	32	34	30	36	13	50	14	49	32	35	31	36
56	10	53	11	37	27	40	26	56	10	54	12	37	27	39	25	56	11	55	12	37	26	38	25
45	19	48	18	64	2	61	3	45	19	47	17	64	2	62	4	45	18	46	17	64	3	63	4
24	42	21	43	5	59	8	58	24	42	22	44	5	59	7	57	24	43	23	44	5	58	6	57
33	31	36	30	52	14	49	15	33	31	35	29	52	14	50	16	33	30	34	29	52	15	51	16
28	38	25	39	9	55	12	54	28	38	26	40	9	55	11	53	28	39	27	40	9	54	10	53
	67/28		68/34		69/64																		
1	63	4	62	20	46	17	47	1	63	3	61	20	46	18	48	1	62	2	61	20	47	19	48
60	6	57	7	41	23	44	22	60	6	58	8	41	23	43	21	60	7	59	8	41	22	42	21
9	55	12	54	28	38	25	39	9	55	11	53	28	38	26	40	9	54	10	53	28	39	27	40
52	14	49	15	33	31	36	30	52	14	50	16	33	31	35	29	52	15	51	16	33	30	34	29
45	19	48	18	64	2	61	3	45	19	47	17	64	2	62	4	45	18	46	17	64	3	63	4
24	42	21	43	5	59	8	58	24	42	22	44	5	59	7	57	24	43	23	44	5	58	6	57
37	27	40	26	56	10	53	11	37	27	39	25	56	10	54	12	37	26	38	25	56	11	55	12
32	34	29	35	13	51	16	50	32	34	30	36	13	51	15	49	32	35	31	36	13	50	14	49

	70/44		71/48		72/74
	1 63 4 62 20 46 17 47		1 63 3 61 20 46 18 48		1 62 2 61 20 47 19 48
	56 10 53 11 37 27 40 26		56 10 54 12 37 27 39 25		56 11 55 12 37 26 38 25
	5 59 8 58 24 42 21 43		5 59 7 57 24 42 22 44		5 58 6 57 24 43 23 44
	52 14 49 15 33 31 36 30		52 14 50 16 33 31 35 29		52 15 51 16 33 30 34 29
	45 19 48 18 64 2 61 3		45 19 47 17 64 2 62 4		45 18 46 17 64 3 63 4
	28 38 25 39 9 55 12 54		28 38 26 40 9 55 11 53		28 39 27 40 9 54 10 53
	41 23 44 22 60 6 57 7		41 23 43 21 60 6 58 8		41 22 42 21 60 7 59 8
	32 34 29 35 13 51 16 50		32 34 30 36 13 51 15 49		32 35 31 36 13 50 14 49
[9]	73/29		74/35		75/65
	1 63 4 62 12 54 9 55		1 63 3 61 12 54 10 56		1 62 2 61 12 55 11 56
	60 6 57 7 49 15 52 14		60 6 58 8 49 15 51 13		60 7 59 8 49 14 50 13
	21 43 24 42 32 34 29 35		21 43 23 41 32 34 30 36		21 42 22 41 32 35 31 36
	48 18 45 19 37 27 40 26		48 18 46 20 37 27 39 25		48 19 47 20 37 26 38 25
	53 11 56 10 64 2 61 3		53 11 55 9 64 2 62 4		53 10 54 9 64 3 63 4
	16 50 13 51 5 59 8 58		16 50 14 52 5 59 7 57		16 51 15 52 5 58 6 57
	33 31 36 30 44 22 41 23		33 31 35 29 44 22 42 24		33 30 34 29 44 23 43 24
	28 38 25 39 17 47 20 46		28 38 26 40 17 47 19 45		28 39 27 40 17 46 18 45
	76/30		77/36		78/66
	1 63 4 62 12 54 9 55		1 63 3 61 12 54 10 56		1 62 2 61 12 55 11 56
	60 6 57 7 49 15 52 14		60 6 58 8 49 15 51 13		60 7 59 8 49 14 50 13
	17 47 20 46 28 38 25 39		17 47 19 45 28 38 26 40		17 46 18 45 28 39 27 40
	44 22 41 23 33 31 36 30		44 22 42 24 33 31 35 29		44 23 43 24 33 30 34 29
	53 11 56 10 64 2 61 3		53 11 55 9 64 2 62 4		53 10 54 9 64 3 63 4
	16 50 13 51 5 59 8 58		16 50 14 52 5 59 7 57		16 51 15 52 5 58 6 57
	37 27 40 26 48 18 45 19		37 27 39 25 48 18 46 20		37 26 38 25 48 19 47 20
	32 34 29 35 21 43 24 42		32 34 30 36 21 43 23 41		32 35 31 36 21 42 22 41
	79/55		80/57		81/81
	1 63 4 62 12 54 9 55		1 63 3 61 12 54 10 56		1 62 2 61 12 55 11 56
	48 18 45 19 37 27 40 26		48 18 46 20 37 27 39 25		48 19 47 20 37 26 38 25
	5 59 8 58 16 50 13 51		5 59 7 57 16 50 14 52		5 58 6 57 16 51 15 52
	44 22 41 23 33 31 36 30		44 22 42 24 33 31 35 29		44 23 43 24 33 30 34 29
	53 11 56 10 64 2 61 3		53 11 55 9 64 2 62 4		53 10 54 9 64 3 63 4
	28 38 25 39 17 47 20 46		28 38 26 40 17 47 19 45		28 39 27 40 17 46 18 45
	49 15 52 14 60 6 57 7		49 15 51 13 60 6 58 8		49 14 50 13 60 7 59 8
	32 34 29 35 21 43 24 42		32 34 30 36 21 43 23 41		32 35 31 36 21 42 22 41
[10]	82/45		83/49		84/75
	1 63 4 62 8 58 5 59		1 63 3 61 8 58 6 60		1 62 2 61 8 59 7 60
	56 10 53 11 49 15 52 14		56 10 54 12 49 15 51 13		56 11 55 12 49 14 50 13
	25 39 28 38 32 34 29 35		25 39 27 37 32 34 30 36		25 38 26 37 32 35 31 36
	48 18 45 19 41 23 44 22		48 18 46 20 41 23 43 21		48 19 47 20 41 22 42 21
	57 7 60 6 64 2 61 3		57 7 59 5 64 2 62 4		57 6 58 5 64 3 63 4
	16 50 13 51 9 55 12 54		16 50 14 52 9 55 11 53		16 51 15 52 9 54 10 53
	33 31 36 30 40 26 37 27		33 31 35 29 40 26 38 28		33 30 34 29 40 27 39 28
	24 42 21 43 17 47 20 46		24 42 22 44 17 47 19 45		24 43 23 44 17 46 18 45
	85/46		86/50		87/76
	1 63 4 62 8 58 5 59		1 63 3 61 8 58 6 60		1 62 2 61 8 59 7 60
	56 10 53 11 49 15 52 14		56 10 54 12 49 15 51 13		56 11 55 12 49 14 50 13
	17 47 20 46 24 42 21 43		17 47 19 45 24 42 22 44		17 46 18 45 24 43 23 44
	40 26 37 27 33 31 36 30		40 26 38 28 33 31 35 29		40 27 39 28 33 30 34 29
	57 7 60 6 64 2 61 3		57 7 59 5 64 2 62 4		57 6 58 5 64 3 63 4
	16 50 13 51 9 55 12 54		16 50 14 52 9 55 11 53		16 51 15 52 9 54 10 53
	41 23 44 22 48 18 45 19		41 23 43 21 48 18 46 20		41 22 42 21 48 19 47 20
	32 34 29 35 25 39 28 38		32 34 30 36 25 39 27 37		32 35 31 36 25 38 26 37
	88/56		89/58		90/82
	1 63 4 62 8 58 5 59		1 63 3 61 8 58 6 60		1 62 2 61 8 59 7 60
	48 18 45 19 41 23 44 22		48 18 46 20 41 23 43 21		48 19 47 20 41 22 42 21
	9 55 12 54 16 50 13 51		9 55 11 53 16 50 14 52		9 54 10 53 16 51 15 52
	40 26 37 27 33 31 36 30		40 26 38 28 33 31 35 29		40 27 39 28 33 30 34 29
	57 7 60 6 64 2 61 3		57 7 59 5 64 2 62 4		57 6 58 5 64 3 63 4
	24 42 21 43 17 47 20 46		24 42 22 44 17 47 19 45		24 43 23 44 17 46 18 45
	49 15 52 14 56 10 53 11		49 15 51 13 56 10 54 12		49 14 50 13 56 11 55 12
	32 34 29 35 25 39 28 38		32 34 30 36 25 39 27 37		32 35 31 36 25 38 26 37

```

** Reconstruction of the Standard 90 Solutions from the **
** Most Fundamental 10 by the new Transformation System **

```

```
[Count = 10 X 9 = 90]
```

```
* Check the Missing of Data or Duplications of any Solution *
```

```
Err: 0
```

```

0: 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
30: 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
60: 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

```

```
[OK!]
```

```

** Calculated and Listed by Kanji Setsuda
   on Sep.30, 2013 with MacOSX 10.8.5 & Xcode 5.0 **

```

Thus we could surely demonstrate those MF10 are really the 'most fundamental' solutions of all, by the successful reconstruction of S90 from MF10 with our new method of transformations. Don't you think so?

#9. What does it mean by this success of reconstruction, theoretically speaking?

It implies, I think, that every S90 solutions have surely inherited the noble character from the only one Origin, 6-dimensional extra-cubic magic object of order 2, drawing a clear line of conversion down to the 3 and 2 dimensions.

We could make a certain contact to the 'common structures' in the various solution sets of C&C Magic Objects of orders 2, 4 and 8, couldn't we?

It means they really have their high 'mathematical symmetry' in themselves.

And we have just come up to the real entrance to the metaphysical study of mysterious magic objects, haven't we? (Forget it.)

(Written by Kanji Setsuda: First Edition in 2000, Second in 2002;
Newest Revision on Oct.19, 2013 with MacOSX 10.8.5 & Xcode 5.0)

E-Mail Address: jag12001@nifty.com

[Program List]

```

/** 'Composite & Complete' Pan-magic Square of Order 8: **
/** Reconstruct the Fundamental 90 Solutions from the **
/** Most Fundamental 10 by the Transformation System **
/** File:'CCMS8F10T90.c' Dictated by Kanji Setsuda **
/** in 2002, 2003 and on Sept.29, 2013 **
/** with MacOSX 10.8.5 and Xcode 5.0 **
/**
#include <stdio.h>
/** Global Variables *
short int fcnt;
short pn[65], qn[65];
short ntbl[91][65];
short f10t[11][65]={
    {1,
      1, 63, 6, 60, 38, 28, 33, 31,
      62, 4, 57, 7, 25, 39, 30, 36,
      11, 53, 16, 50, 48, 18, 43, 21,
      56, 10, 51, 13, 19, 45, 24, 42,
      27, 37, 32, 34, 64, 2, 59, 5,
      40, 26, 35, 29, 3, 61, 8, 58,
      17, 47, 22, 44, 54, 12, 49, 15,

```

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

```

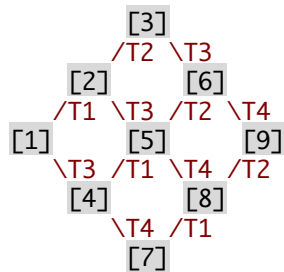
    60, 6, 57, 7, 49, 15, 52, 14,
    21, 43, 24, 42, 32, 34, 29, 35,
    48, 18, 45, 19, 37, 27, 40, 26,
    53, 11, 56, 10, 64, 2, 61, 3,
    16, 50, 13, 51, 5, 59, 8, 58,
    33, 31, 36, 30, 44, 22, 41, 23,
    28, 38, 25, 39, 17, 47, 20, 46},
{10,
    1, 63, 4, 62, 8, 58, 5, 59,
    56, 10, 53, 11, 49, 15, 52, 14,
    25, 39, 28, 38, 32, 34, 29, 35,
    48, 18, 45, 19, 41, 23, 44, 22,
    57, 7, 60, 6, 64, 2, 61, 3,
    16, 50, 13, 51, 9, 55, 12, 54,
    33, 31, 36, 30, 40, 26, 37, 27,
    24, 42, 21, 43, 17, 47, 20, 46}
};
//
/* Sub-Routiens *
void trnsf90(void);
void prans(void);
void trans1(void), trans2(void), trans3(void), trans4(void);
void trans5(void), trans6(void), reflct(void);
//
/* Main Program *
int main(){
    printf("\n");
    printf(" ** 'Composite & Complete' Magic Square of Order 8: **\n");
    printf(" ** Reconstruct the Fundamental 90 Solutions from the **\n");
    printf(" ** Most Fundamental 10 by the Transformation System **\n");
    printf("\n");
    fcnt=10;
    trnsf90();
    prans();
    printf("\n");
    printf(" [Count = %d X %d = %d]\n",fcnt,9,fcnt*9);
    printf("\n");
    printf(" [OK!]\n");
    printf("\n");
    printf("*** Calculated and Listed by Kanji Setsuda\n");
    printf("    on Sep.29, 2013 with MacOSX 10.8.5 & Xcode 5.0 **\n");
    printf("\n");
    return 0;
}
//
/* Reconstruct The Objects *
void trnsf90(){
    short m,m9,n;
    for(m=0;m<fcnt;m++){m9=m*9;
    /* First Three: 1/, 2/, 3/ *
        for(n=1;n<65;n++){ntbl[m9][n]=f10t[m][n];}
        ntbl[m9][0]=m9+1;
        for(n=1;n<65;n++){pn[n]=f10t[m][n];}
        trans1();
        for(n=1;n<65;n++){ntbl[m9+1][n]=qn[n];}
        ntbl[m9+1][0]=m9+2;
        for(n=1;n<65;n++){pn[n]=qn[n];}
        trans2();
        for(n=1;n<65;n++){pn[n]=qn[n];}
        reflct();
        for(n=1;n<65;n++){ntbl[m9+2][n]=qn[n];}
        ntbl[m9+2][0]=m9+3;
    /* Next Two: 1/-> 4/, 7/ *
        for(n=1;n<65;n++){pn[n]=f10t[m][n];}
        trans3();
        for(n=1;n<65;n++){ntbl[m9+3][n]=qn[n];}

```

```

ntbl[m9+3][0]=m9+4;
for(n=1;n<65;n++){pn[n]=qn[n];}
trans4();
for(n=1;n<65;n++){pn[n]=qn[n];}
reflect();
for(n=1;n<65;n++){ntbl[m9+6][n]=qn[n];}
ntbl[m9+6][0]=m9+7;
/* Next Two: 2/-> 5/, 6/ *
for(n=1;n<65;n++){pn[n]=ntbl[m9+1][n];}
trans3();
for(n=1;n<65;n++){ntbl[m9+4][n]=qn[n];}
ntbl[m9+4][0]=m9+5;
for(n=1;n<65;n++){pn[n]=qn[n];}
trans2();
for(n=1;n<65;n++){pn[n]=qn[n];}
reflect();
for(n=1;n<65;n++){ntbl[m9+5][n]=qn[n];}
ntbl[m9+5][0]=m9+6;
/* Last three: 5/-> 8/, 9/ *
for(n=1;n<65;n++){pn[n]=ntbl[m9+4][n];}
trans4();
for(n=1;n<65;n++){pn[n]=qn[n];}
reflect();
for(n=1;n<65;n++){ntbl[m9+7][n]=qn[n];}
ntbl[m9+7][0]=m9+8;
for(n=1;n<65;n++){pn[n]=qn[n];}
trans2();
for(n=1;n<65;n++){pn[n]=qn[n];}
reflect();
for(n=1;n<65;n++){ntbl[m9+8][n]=qn[n];}
ntbl[m9+8][0]=m9+9;
}
}
//
/* Transition Diagram for Transformation *
// 1 - 2; 2 - 1;
// 1 - 4; 4 - 1;
// 2 - 3; 3 - 2;
// 2 - 5; 5 - 2;
// 3 - 6; 6 - 3;
// 4 - 5; 5 - 4;
// 4 - 7; 7 - 4;
// 5 - 6; 6 - 5;
// 5 - 8; 8 - 5;
// 6 - 9; 9 - 6;
// 7 - 8; 8 - 7;
// 8 - 9; 9 - 8;
//
/* Print the Answers *
void prans(){
short k,k3,l,l8,m,n;
for(k=0;k<30;k++){k3=k*3;
if(k%3==0){printf(" [%2d]",(k/3)+1);}else{printf(" ");}
printf("%20d/%25d/%25d/\n",k3+1,k3+2,k3+3);
for(l=0;l<8;l++){l8=l*8;
for(m=0;m<3;m++){
printf(" ");
for(n=1;n<9;n++){
printf("%3d",ntbl[k3+m][l8+n]);
}
}
printf("\n");
}
}
}
//

```




```

/* Transformation: Type 1 *
void trans1(){
    qn[1]=pn[1];    qn[2]=pn[2];    qn[3]=pn[40];    qn[4]=pn[39];
    qn[5]=pn[5];    qn[6]=pn[6];    qn[7]=pn[36];    qn[8]=pn[35];
    qn[9]=pn[9];    qn[10]=pn[10];    qn[11]=pn[48];    qn[12]=pn[47];
    qn[13]=pn[13];    qn[14]=pn[14];    qn[15]=pn[44];    qn[16]=pn[43];
    qn[17]=pn[17];    qn[18]=pn[18];    qn[19]=pn[56];    qn[20]=pn[55];
    qn[21]=pn[21];    qn[22]=pn[22];    qn[23]=pn[52];    qn[24]=pn[51];
    qn[25]=pn[25];    qn[26]=pn[26];    qn[27]=pn[64];    qn[28]=pn[63];
    qn[29]=pn[29];    qn[30]=pn[30];    qn[31]=pn[60];    qn[32]=pn[59];
    qn[33]=pn[33];    qn[34]=pn[34];    qn[35]=pn[8];    qn[36]=pn[7];
    qn[37]=pn[37];    qn[38]=pn[38];    qn[39]=pn[4];    qn[40]=pn[3];
    qn[41]=pn[41];    qn[42]=pn[42];    qn[43]=pn[16];    qn[44]=pn[15];
    qn[45]=pn[45];    qn[46]=pn[46];    qn[47]=pn[12];    qn[48]=pn[11];
    qn[49]=pn[49];    qn[50]=pn[50];    qn[51]=pn[24];    qn[52]=pn[23];
    qn[53]=pn[53];    qn[54]=pn[54];    qn[55]=pn[20];    qn[56]=pn[19];
    qn[57]=pn[57];    qn[58]=pn[58];    qn[59]=pn[32];    qn[60]=pn[31];
    qn[61]=pn[61];    qn[62]=pn[62];    qn[63]=pn[28];    qn[64]=pn[27];
}
/* Transformation: Type 2 *
void trans2(){
    qn[1]=pn[1];    qn[2]=pn[39];    qn[3]=pn[38];    qn[4]=pn[4];
    qn[5]=pn[5];    qn[6]=pn[35];    qn[7]=pn[34];    qn[8]=pn[8];
    qn[9]=pn[9];    qn[10]=pn[47];    qn[11]=pn[46];    qn[12]=pn[12];
    qn[13]=pn[13];    qn[14]=pn[43];    qn[15]=pn[42];    qn[16]=pn[16];
    qn[17]=pn[17];    qn[18]=pn[55];    qn[19]=pn[54];    qn[20]=pn[20];
    qn[21]=pn[21];    qn[22]=pn[51];    qn[23]=pn[50];    qn[24]=pn[24];
    qn[25]=pn[25];    qn[26]=pn[63];    qn[27]=pn[62];    qn[28]=pn[28];
    qn[29]=pn[29];    qn[30]=pn[59];    qn[31]=pn[58];    qn[32]=pn[32];
    qn[33]=pn[33];    qn[34]=pn[7];    qn[35]=pn[6];    qn[36]=pn[36];
    qn[37]=pn[37];    qn[38]=pn[3];    qn[39]=pn[2];    qn[40]=pn[40];
    qn[41]=pn[41];    qn[42]=pn[15];    qn[43]=pn[14];    qn[44]=pn[44];
    qn[45]=pn[45];    qn[46]=pn[11];    qn[47]=pn[10];    qn[48]=pn[48];
    qn[49]=pn[49];    qn[50]=pn[23];    qn[51]=pn[22];    qn[52]=pn[52];
    qn[53]=pn[53];    qn[54]=pn[19];    qn[55]=pn[18];    qn[56]=pn[56];
    qn[57]=pn[57];    qn[58]=pn[31];    qn[59]=pn[30];    qn[60]=pn[60];
    qn[61]=pn[61];    qn[62]=pn[27];    qn[63]=pn[26];    qn[64]=pn[64];
}
/* Transformation: Type 3 *
void trans3(){
    qn[1]=pn[1];    qn[2]=pn[2];    qn[3]=pn[3];    qn[4]=pn[4];
    qn[5]=pn[5];    qn[6]=pn[6];    qn[7]=pn[7];    qn[8]=pn[8];
    qn[9]=pn[9];    qn[10]=pn[10];    qn[11]=pn[11];    qn[12]=pn[12];
    qn[13]=pn[13];    qn[14]=pn[14];    qn[15]=pn[15];    qn[16]=pn[16];
    qn[17]=pn[61];    qn[18]=pn[62];    qn[19]=pn[63];    qn[20]=pn[64];
    qn[21]=pn[57];    qn[22]=pn[58];    qn[23]=pn[59];    qn[24]=pn[60];
    qn[25]=pn[53];    qn[26]=pn[54];    qn[27]=pn[55];    qn[28]=pn[56];
    qn[29]=pn[49];    qn[30]=pn[50];    qn[31]=pn[51];    qn[32]=pn[52];
    qn[33]=pn[33];    qn[34]=pn[34];    qn[35]=pn[35];    qn[36]=pn[36];
    qn[37]=pn[37];    qn[38]=pn[38];    qn[39]=pn[39];    qn[40]=pn[40];
    qn[41]=pn[41];    qn[42]=pn[42];    qn[43]=pn[43];    qn[44]=pn[44];
    qn[45]=pn[45];    qn[46]=pn[46];    qn[47]=pn[47];    qn[48]=pn[48];
    qn[49]=pn[29];    qn[50]=pn[30];    qn[51]=pn[31];    qn[52]=pn[32];
    qn[53]=pn[25];    qn[54]=pn[26];    qn[55]=pn[27];    qn[56]=pn[28];
    qn[57]=pn[21];    qn[58]=pn[22];    qn[59]=pn[23];    qn[60]=pn[24];
    qn[61]=pn[17];    qn[62]=pn[18];    qn[63]=pn[19];    qn[64]=pn[20];
}
/* Transformation: Type 4 *
void trans4(){
    qn[1]=pn[1];    qn[2]=pn[2];    qn[3]=pn[3];    qn[4]=pn[4];
    qn[5]=pn[5];    qn[6]=pn[6];    qn[7]=pn[7];    qn[8]=pn[8];
    qn[9]=pn[53];    qn[10]=pn[54];    qn[11]=pn[55];    qn[12]=pn[56];
    qn[13]=pn[49];    qn[14]=pn[50];    qn[15]=pn[51];    qn[16]=pn[52];
    qn[17]=pn[45];    qn[18]=pn[46];    qn[19]=pn[47];    qn[20]=pn[48];
    qn[21]=pn[41];    qn[22]=pn[42];    qn[23]=pn[43];    qn[24]=pn[44];
    qn[25]=pn[25];    qn[26]=pn[26];    qn[27]=pn[27];    qn[28]=pn[28];
}

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qn[29]=pn[29]; qn[30]=pn[30]; qn[31]=pn[31]; qn[32]=pn[32];
qn[33]=pn[33]; qn[34]=pn[34]; qn[35]=pn[35]; qn[36]=pn[36];
qn[37]=pn[37]; qn[38]=pn[38]; qn[39]=pn[39]; qn[40]=pn[40];
qn[41]=pn[21]; qn[42]=pn[22]; qn[43]=pn[23]; qn[44]=pn[24];
qn[45]=pn[17]; qn[46]=pn[18]; qn[47]=pn[19]; qn[48]=pn[20];
qn[49]=pn[13]; qn[50]=pn[14]; qn[51]=pn[15]; qn[52]=pn[16];
qn[53]=pn[9]; qn[54]=pn[10]; qn[55]=pn[11]; qn[56]=pn[12];
qn[57]=pn[57]; qn[58]=pn[58]; qn[59]=pn[59]; qn[60]=pn[60];
qn[61]=pn[61]; qn[62]=pn[62]; qn[63]=pn[63]; qn[64]=pn[64];
}
/* Mirror Reflection */
void reflct(){
short n;
for(n=1;n<65;n++){qn[n]=pn[n];}
if(pn[9]>pn[2]){
qn[1]=pn[1]; qn[2]=pn[9]; qn[3]=pn[17]; qn[4]=pn[25];
qn[5]=pn[33]; qn[6]=pn[41]; qn[7]=pn[49]; qn[8]=pn[57];
qn[9]=pn[2]; qn[10]=pn[10]; qn[11]=pn[18]; qn[12]=pn[26];
qn[13]=pn[34]; qn[14]=pn[42]; qn[15]=pn[50]; qn[16]=pn[58];
qn[17]=pn[3]; qn[18]=pn[11]; qn[19]=pn[19]; qn[20]=pn[27];
qn[21]=pn[35]; qn[22]=pn[43]; qn[23]=pn[51]; qn[24]=pn[59];
qn[25]=pn[4]; qn[26]=pn[12]; qn[27]=pn[20]; qn[28]=pn[28];
qn[29]=pn[36]; qn[30]=pn[44]; qn[31]=pn[52]; qn[32]=pn[60];
qn[33]=pn[5]; qn[34]=pn[13]; qn[35]=pn[21]; qn[36]=pn[29];
qn[37]=pn[37]; qn[38]=pn[45]; qn[39]=pn[53]; qn[40]=pn[61];
qn[41]=pn[6]; qn[42]=pn[14]; qn[43]=pn[22]; qn[44]=pn[30];
qn[45]=pn[38]; qn[46]=pn[46]; qn[47]=pn[54]; qn[48]=pn[62];
qn[49]=pn[7]; qn[50]=pn[15]; qn[51]=pn[23]; qn[52]=pn[31];
qn[53]=pn[39]; qn[54]=pn[47]; qn[55]=pn[55]; qn[56]=pn[63];
qn[57]=pn[8]; qn[58]=pn[16]; qn[59]=pn[24]; qn[60]=pn[32];
qn[61]=pn[40]; qn[62]=pn[48]; qn[63]=pn[56]; qn[64]=pn[64];
}
}
//

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