

Part 4 : "New Advanced Study of Magic Squares and Cubes"
 Chapter 4 : Commentary Articles No.2 by Kanji Setsuda:
 "Various Arts and Tools for Studying Magic Squares"
 Section 15-2: Make 'Complete Euler Cubes' of Order 5
 for the Pan-triagonal Type

0. What I like to do in this Section:

I would like to challenge next to make Pan-triagonal Magic Cubes of Order 5.

Since it would be too hard for us to make any ordinary type of this object, I would like to build the 'Complete Euler Type' instead, under the Positional Number System of Base 5 and count all the standard solutions through.

1. What the 'Pan-triagonal' Magic Cubes of Order 5 mean:

At first I like to explain a few things about what it means by the 'Pan-triagonal' Magic Cubes of Order 5 with a set of diagrams below. Each of them illustrates the unique 'Pan-magic Shift' of our three-dimensional pan-magic cubes of order 5.

Suppose Fig. 1 for our Basic Diagram representing the Basic Form of MC555.

Watch the next Fig. 2 carefully. What is the difference between Fig. 1 and Fig. 2?

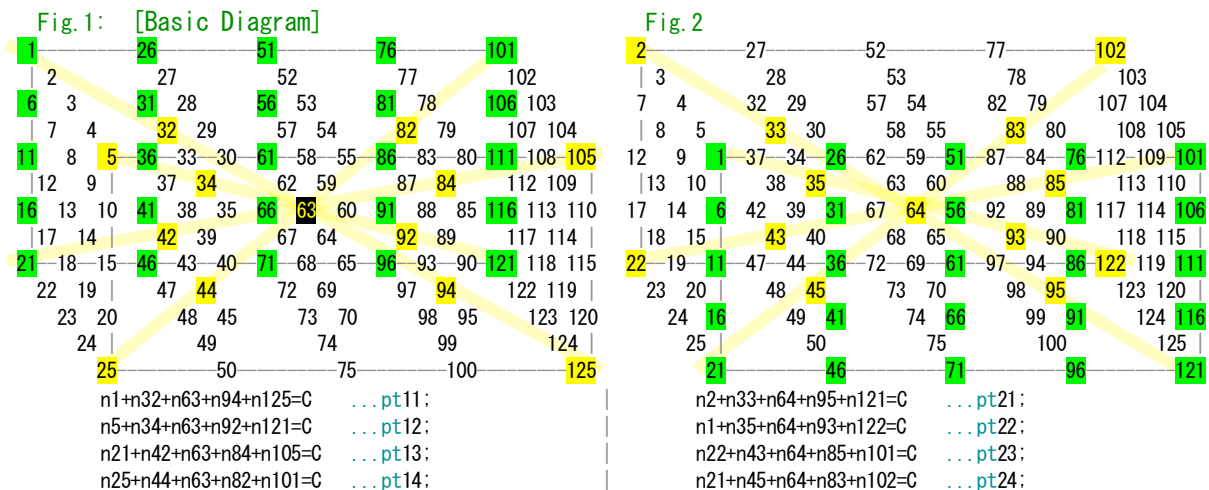
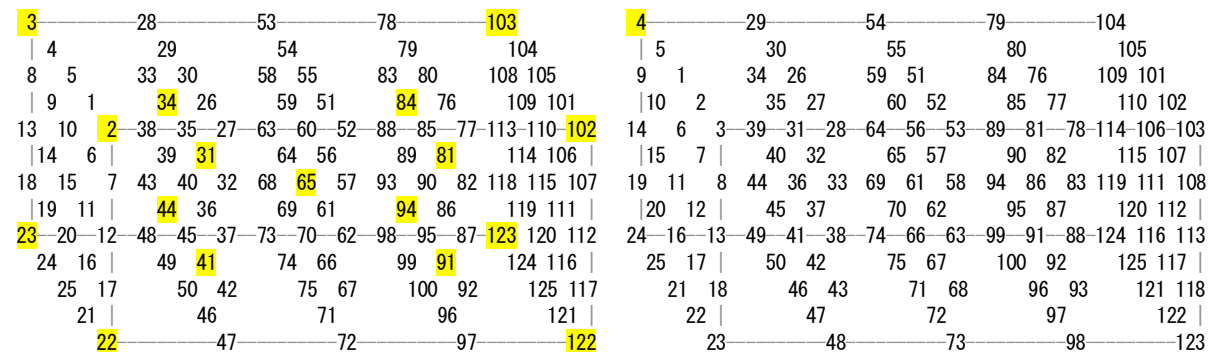


Fig. 2 is transformed from Fig. 1, moving the vertical plane with 25 numbers at the back side far beyond the front end. This tells us about what the Pan-magic Shift does.

I want you to check if each sum of rows, columns and pillars is kept equal to the previous value, say, the constant sum. How about the new four Primary Triagonals?

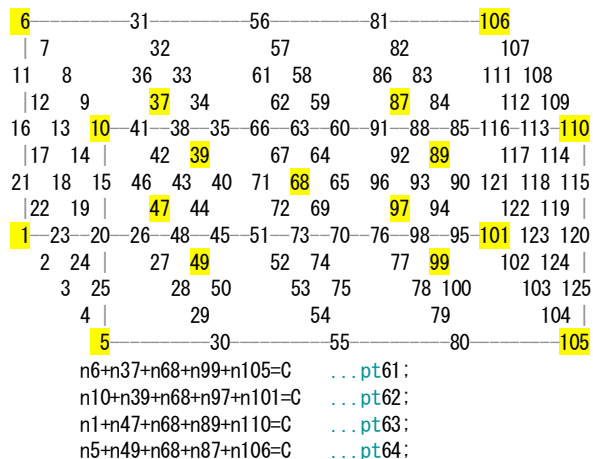
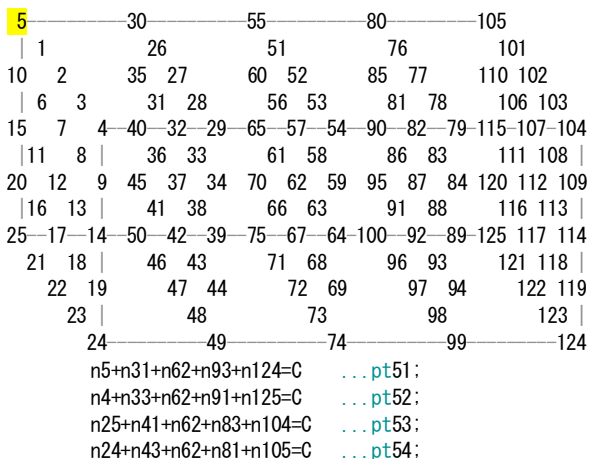
What do we have to do, if we want the new triagonals to be always equal to the constant sum? How about defining the conditions pt21-24 above as true before all?

Let's do that and suppose all these four to be the new 'Pan-triagonals'.



$n3+n34+n65+n91+n122=C$...pt31;
 $n2+n31+n65+n94+n123=C$...pt32;
 $n23+n44+n65+n81+n102=C$...pt33;
 $n22+n41+n65+n84+n103=C$...pt34;

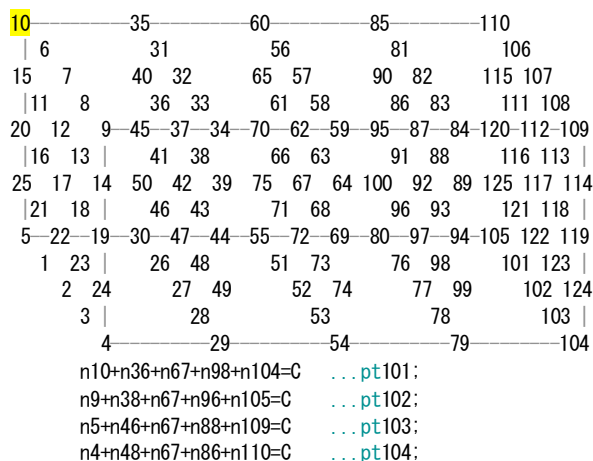
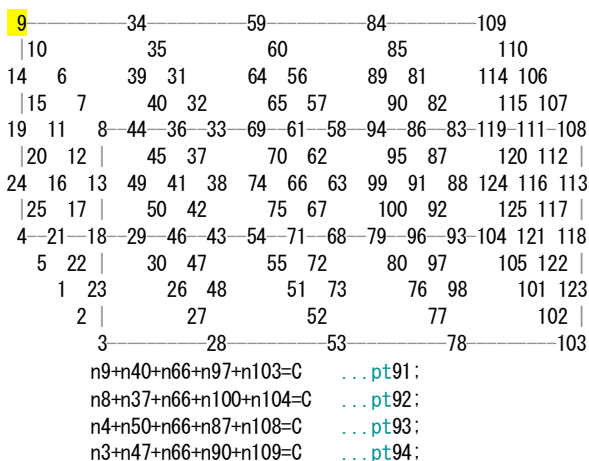
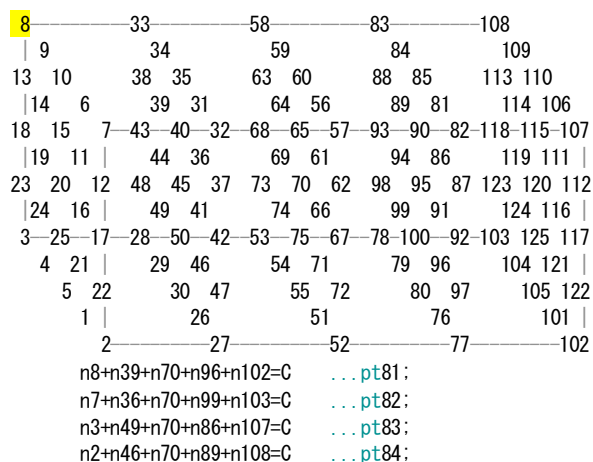
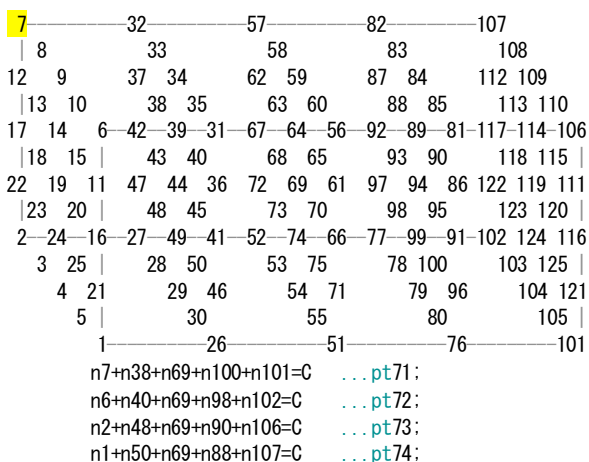
$n4+n35+n61+n92+n123=C$...pt41;
 $n3+n32+n61+n95+n124=C$...pt42;
 $n24+n45+n61+n82+n103=C$...pt43;
 $n23+n42+n61+n85+n104=C$...pt44;



Successive diagrams Fig. 3, 4 and 5 are transformed from the former one, repeating the continuous shift of the vertical plane on the back side up to before the front.

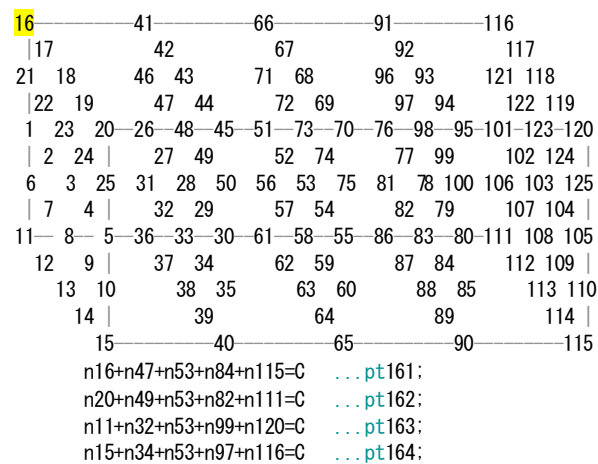
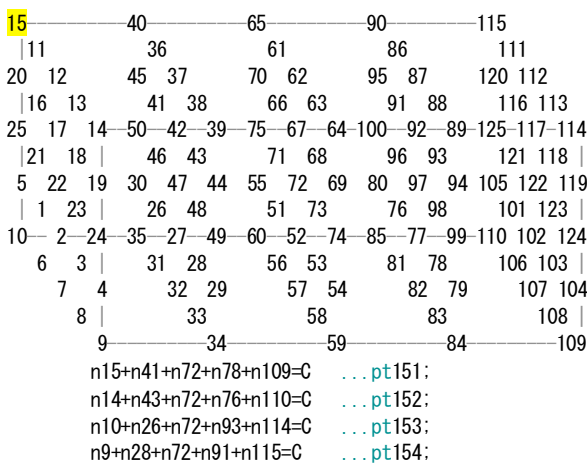
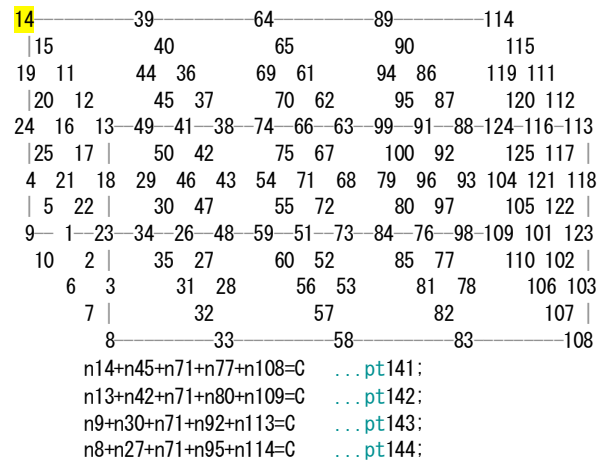
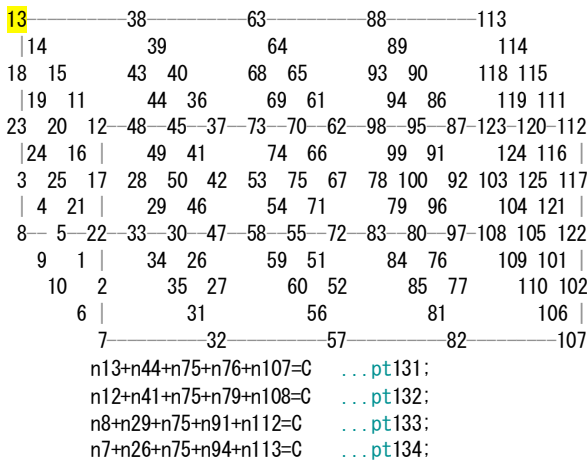
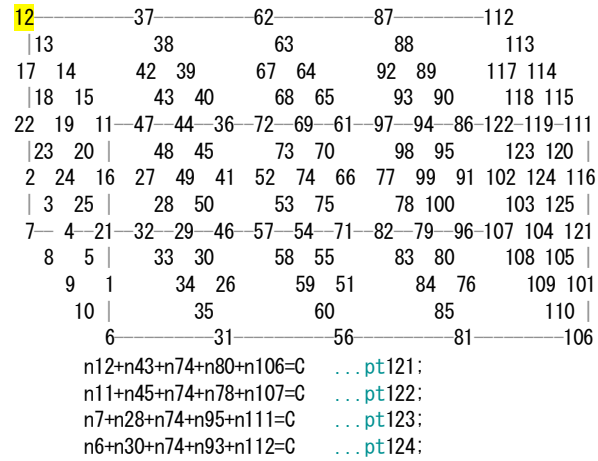
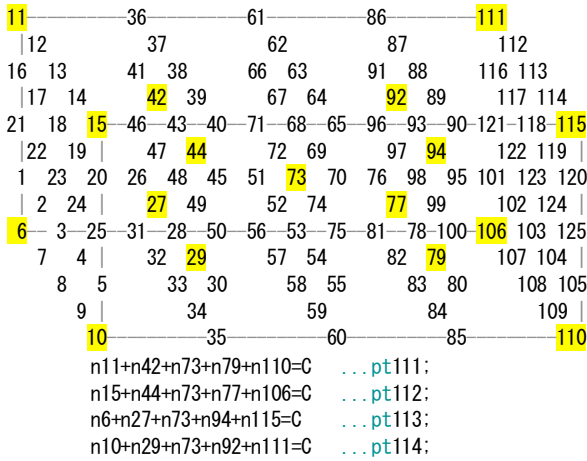
If you want every result to be always pan-magic, you should presuppose all the new conditions above to be true for the Pan-triagonals at the first definition stage.

Fig. 6 illustrates a new style of Pan-magic Shift. Fig. 6 is transformed from the basic Fig. 1, moving the horizontal plane with 25 numbers on the top down to the bottom end. Successive diagrams Fig. 7-10 are transformed from the former one, repeating the first type of shift with the plane moving from the back side far to the front end.



If you want every result to be always pan-magic, you should add all those new conditions above to the first definition list for the Pan-triagonals.

Fig. 11 is transformed from the Fig. 6, moving the horizontal plane with 25 numbers on the top down to beneath the bottom. Successive Fig. 12–15 are transformed from the former one by the first type, repeating the continuous shift of the plane from the back side to the front end.



If you want every result to be always pan-magic, you should also add all those new conditions above to the first definition list for the Pan-triagonals.

Fig. 16 and 21 is transformed from the Fig. 6 and 11, moving the horizontal plane on the top far to the bottom end. Successive Fig. 22–25 are transformed from the former one by the first type, repeating plane-shift from the back side to the front end.

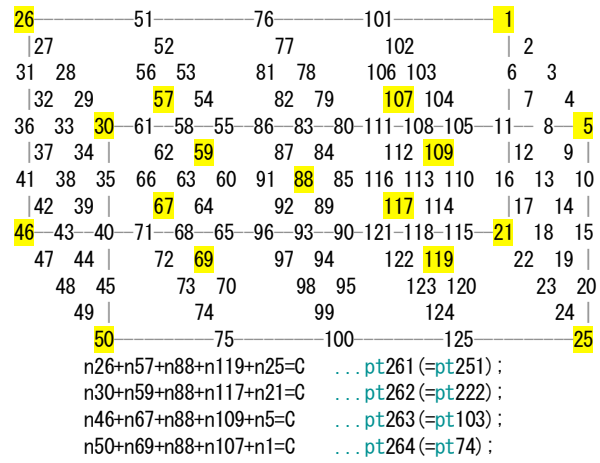
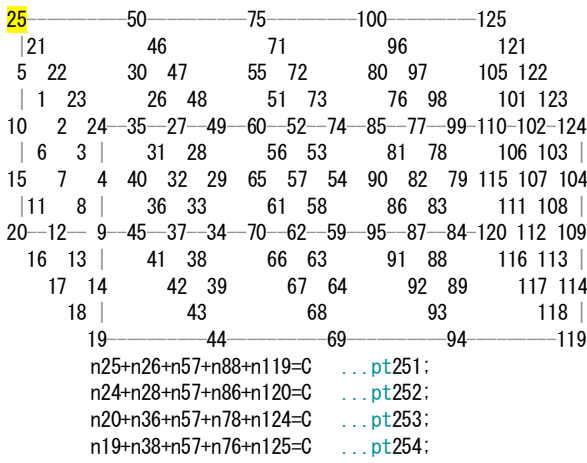
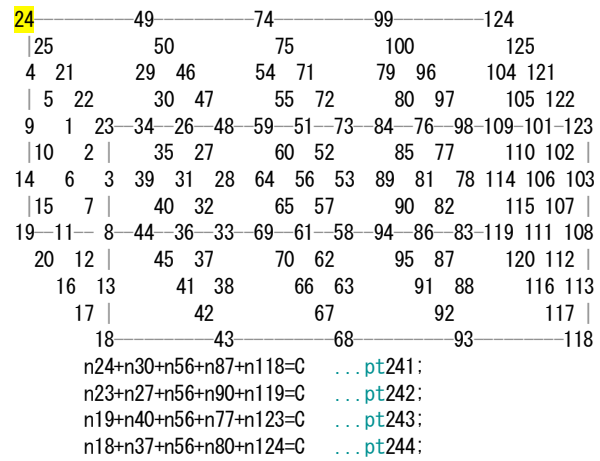
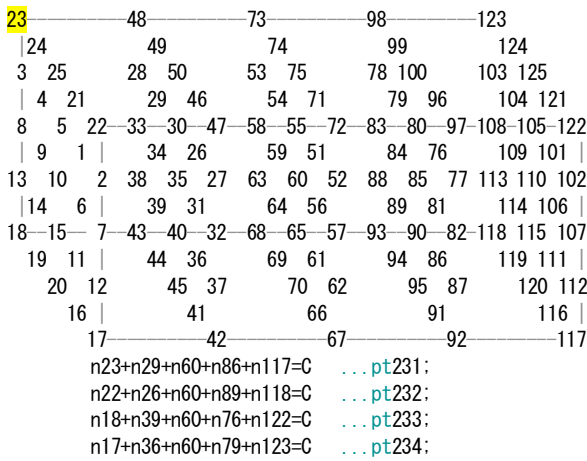
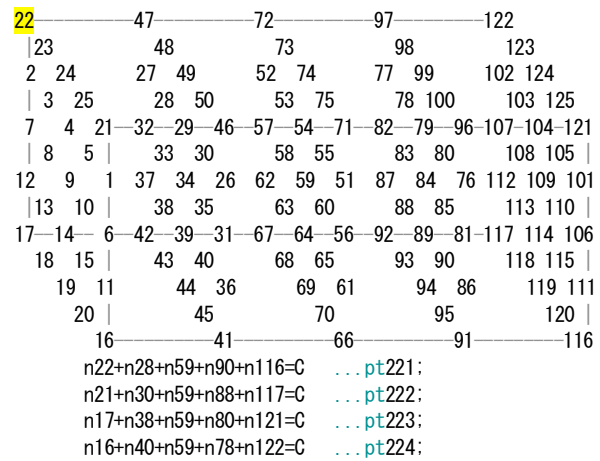
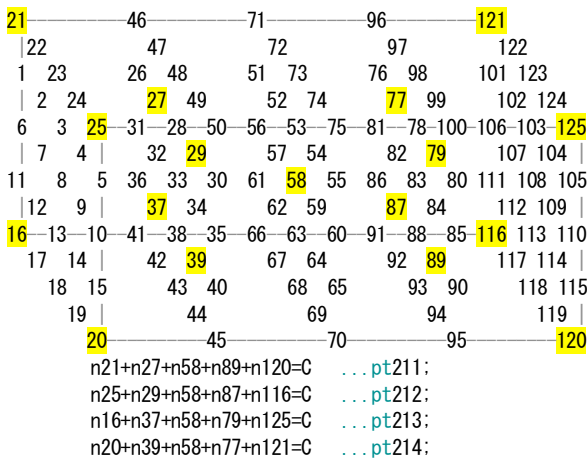
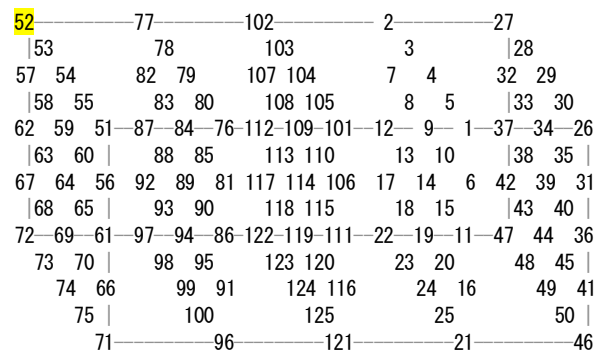
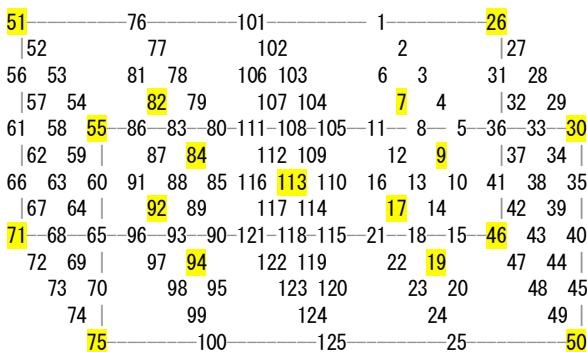


Fig. 26 illustrates another style of Pan-magic Shift. It is transformed from the basic Fig. 1, moving the vertical plane at the left side far beyond the right end. The next Fig. 51 is transformed from the Fig. 26 in the same way.



| | | | | |
|--------------------------|---------------------|--|--------------------------|---------------------|
| $n51+n82+n113+n19+n50=C$ | ... pt511 (=pt191); | | $n52+n83+n114+n20+n46=C$ | ... pt521 (=pt201); |
| $n55+n84+n113+n17+n46=C$ | ... pt512 (=pt182); | | $n51+n85+n114+n18+n47=C$ | ... pt522 (=pt192); |
| $n71+n92+n113+n9+n30=C$ | ... pt513 (=pt143); | | $n72+n93+n114+n10+n26=C$ | ... pt523 (=pt153); |
| $n75+n94+n113+n7+n26=C$ | ... pt514 (=pt134); | | $n71+n95+n114+n8+n27=C$ | ... pt524 (=pt144); |

There are three styles of Pan-magic Shift in all for our magic cube of any order: (1) From the back side to the front end, (2) From the top side down to the bottom end and (3) From the left side to the right end. But you may suppose opposite directions to every dimensional shifting: (4) From the front side to the back, (5) From the bottom side up to the top, (6) From the right side to the left. And you may combine any of those six styles one after another to make any different cubes from each other.

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|--|----------------|------------|-------------|-------|----|----|-----|----|----|----|-------|---------|-------|-------|-------|-------|---------|-------|-------|-------|--------|----------------|------------|-------------|----|-------|---------|------|-------|-------|-------|----------------|-----------|-------------|----|-------|---------|-----|-------|-------|----------------------------|---------------|-------|--|--|-------|---------|------|-------|-------|-------|---------|------|-------|-------|----|-----|----|----|----|----|-----|----|----|----|---|----|-----|----|----|----|----|-----|----|----|----|-------|---------|-------|-------|-------|--------|---------|-------|-------|-------|-------|----------------|------------|-------------|----|-------|---------|------|-------|-------|-------|----------------|------------|-------------|--|-------|---------|------|-------|-------|--------------------------------------|----------|--|--|--|-------|---------|------|-------|-------|-------|---------|------|-------|-------|----|-----|----|----|----|----|-----|----|----|----|
| <table border="0"> <tr><td>93</td><td>118</td><td>18</td><td>43</td><td>68</td></tr> <tr><td>94</td><td>119</td><td>19</td><td>44</td><td>69</td></tr> <tr><td>98 95</td><td>123 120</td><td>23 20</td><td>48 45</td><td>73 70</td></tr> <tr><td>99 91</td><td>124 116</td><td>24 16</td><td>49 41</td><td>74 66</td></tr> <tr><td>78 100</td><td>92-103-125-117</td><td>3-25-17-28</td><td>50-42-53-75</td><td>67</td></tr> <tr><td>79 96</td><td>104 121</td><td>4 21</td><td>29 46</td><td>54 71</td></tr> <tr><td>83 80</td><td>97 108 105 122</td><td>8 5 22 33</td><td>30 47 58 55</td><td>72</td></tr> <tr><td>84 76</td><td>109 101</td><td>9 1</td><td>34 26</td><td>59 51</td></tr> <tr><td>88-85-77-113-110-102-13-10</td><td>2-38-35-27-63</td><td>60 52</td><td></td><td></td></tr> <tr><td>89 81</td><td>114 106</td><td>14 6</td><td>39 31</td><td>64 56</td></tr> <tr><td>90 82</td><td>115 107</td><td>15 7</td><td>40 32</td><td>65 57</td></tr> <tr><td>86</td><td>111</td><td>11</td><td>36</td><td>61</td></tr> <tr><td>87</td><td>112</td><td>12</td><td>37</td><td>62</td></tr> </table> <p> $n93+n124+n5+n31+n62=C$... pt931 (=pt51); $n92+n121+n5+n34+n63=C$... pt932 (=pt12); $n88+n109+n5+n46+n67=C$... pt933 (=pt103); $n87+n106+n5+n49+n68=C$... pt934 (=pt64); </p> | 93 | 118 | 18 | 43 | 68 | 94 | 119 | 19 | 44 | 69 | 98 95 | 123 120 | 23 20 | 48 45 | 73 70 | 99 91 | 124 116 | 24 16 | 49 41 | 74 66 | 78 100 | 92-103-125-117 | 3-25-17-28 | 50-42-53-75 | 67 | 79 96 | 104 121 | 4 21 | 29 46 | 54 71 | 83 80 | 97 108 105 122 | 8 5 22 33 | 30 47 58 55 | 72 | 84 76 | 109 101 | 9 1 | 34 26 | 59 51 | 88-85-77-113-110-102-13-10 | 2-38-35-27-63 | 60 52 | | | 89 81 | 114 106 | 14 6 | 39 31 | 64 56 | 90 82 | 115 107 | 15 7 | 40 32 | 65 57 | 86 | 111 | 11 | 36 | 61 | 87 | 112 | 12 | 37 | 62 | <table border="0"> <tr><td>94</td><td>119</td><td>19</td><td>44</td><td>69</td></tr> <tr><td>95</td><td>120</td><td>20</td><td>45</td><td>70</td></tr> <tr><td>99 91</td><td>124 116</td><td>24 16</td><td>49 41</td><td>74 66</td></tr> <tr><td>100 92</td><td>125 117</td><td>25 17</td><td>50 42</td><td>75 67</td></tr> <tr><td>79 96</td><td>93-104-121-118</td><td>4-21-18-29</td><td>46-43-54-71</td><td>68</td></tr> <tr><td>80 97</td><td>105 122</td><td>5 22</td><td>30 47</td><td>55 72</td></tr> <tr><td>84 76</td><td>98 109 101 123</td><td>9 23 34 26</td><td>48 59 51 73</td><td></td></tr> <tr><td>85 77</td><td>110 102</td><td>10 2</td><td>35 27</td><td>60 52</td></tr> <tr><td>89-81-78-114-106-103-14-6-3-39-31-28</td><td>64 56 53</td><td></td><td></td><td></td></tr> <tr><td>90 82</td><td>115 107</td><td>15 7</td><td>40 32</td><td>65 57</td></tr> <tr><td>86 83</td><td>111 108</td><td>11 8</td><td>36 33</td><td>61 58</td></tr> <tr><td>87</td><td>112</td><td>12</td><td>37</td><td>62</td></tr> <tr><td>88</td><td>113</td><td>13</td><td>38</td><td>63</td></tr> </table> <p> $n94+n125+n1+n32+n63=C$... pt941 (=pt11); $n93+n122+n1+n35+n64=C$... pt942 (=pt22); $n89+n110+n1+n47+n68=C$... pt943 (=pt63); $n88+n107+n1+n50+n69=C$... pt944 (=pt74); </p> | 94 | 119 | 19 | 44 | 69 | 95 | 120 | 20 | 45 | 70 | 99 91 | 124 116 | 24 16 | 49 41 | 74 66 | 100 92 | 125 117 | 25 17 | 50 42 | 75 67 | 79 96 | 93-104-121-118 | 4-21-18-29 | 46-43-54-71 | 68 | 80 97 | 105 122 | 5 22 | 30 47 | 55 72 | 84 76 | 98 109 101 123 | 9 23 34 26 | 48 59 51 73 | | 85 77 | 110 102 | 10 2 | 35 27 | 60 52 | 89-81-78-114-106-103-14-6-3-39-31-28 | 64 56 53 | | | | 90 82 | 115 107 | 15 7 | 40 32 | 65 57 | 86 83 | 111 108 | 11 8 | 36 33 | 61 58 | 87 | 112 | 12 | 37 | 62 | 88 | 113 | 13 | 38 | 63 |
| 93 | 118 | 18 | 43 | 68 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 94 | 119 | 19 | 44 | 69 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 98 95 | 123 120 | 23 20 | 48 45 | 73 70 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| 79 96 | 104 121 | 4 21 | 29 46 | 54 71 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 83 80 | 97 108 105 122 | 8 5 22 33 | 30 47 58 55 | 72 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| 88-85-77-113-110-102-13-10 | 2-38-35-27-63 | 60 52 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 89 81 | 114 106 | 14 6 | 39 31 | 64 56 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 90 82 | 115 107 | 15 7 | 40 32 | 65 57 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 86 | 111 | 11 | 36 | 61 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 87 | 112 | 12 | 37 | 62 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 94 | 119 | 19 | 44 | 69 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 95 | 120 | 20 | 45 | 70 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 99 91 | 124 116 | 24 16 | 49 41 | 74 66 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 100 92 | 125 117 | 25 17 | 50 42 | 75 67 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 79 96 | 93-104-121-118 | 4-21-18-29 | 46-43-54-71 | 68 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 80 97 | 105 122 | 5 22 | 30 47 | 55 72 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 84 76 | 98 109 101 123 | 9 23 34 26 | 48 59 51 73 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 85 77 | 110 102 | 10 2 | 35 27 | 60 52 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 89-81-78-114-106-103-14-6-3-39-31-28 | 64 56 53 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 90 82 | 115 107 | 15 7 | 40 32 | 65 57 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 86 83 | 111 108 | 11 8 | 36 33 | 61 58 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 87 | 112 | 12 | 37 | 62 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 88 | 113 | 13 | 38 | 63 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|------------------|-----------------------------|----------|-------|----|-----|---|----|----|----|---------|-----|-------|-------|-------|---------|-----|-------|-------|-------|---------|--------|-----------------------------|----|--|---------|------|-------|-------|-------|-------------|-------------|----------------|----------|--|---------|-------|-------|-------|-------|--|----------|--|--|--|---------|-------|-------|-------|-------|---------|-------|-------|-------|-------|-----|----|----|----|----|-----|----|----|----|-----|--|-----|---|----|----|----|-----|---|----|----|----|---------|-----|-------|-------|-------|---------|-----|-------|-------|-------|---|----|--|--|--|---------|-------|-------|-------|-------|-------------|------------------|-------------------|--|--|---------|-------|-------|-------|-------|---|--|--|--|--|---------|-------|-------|-------|-------|---------|-------|-------|-------|-------|-----|----|----|----|-----|-----|----|----|----|----|
| <table border="0"> <tr><td>101</td><td>1</td><td>26</td><td>51</td><td>76</td></tr> <tr><td>102</td><td>2</td><td>27</td><td>52</td><td>77</td></tr> <tr><td>106 103</td><td>6 3</td><td>31 28</td><td>56 53</td><td>81 78</td></tr> <tr><td>107 104</td><td>7 4</td><td>32 29</td><td>57 54</td><td>82 79</td></tr> <tr><td>111 108</td><td>105-11</td><td>8-5-36-33-30-61-58-55-86-83</td><td>80</td><td></td></tr> <tr><td>112 109</td><td>12 9</td><td>37 34</td><td>62 59</td><td>87 84</td></tr> <tr><td>116 113 110</td><td>16 13 10 41</td><td>38 35 66 63 60</td><td>91 88 85</td><td></td></tr> <tr><td>117 114</td><td>17 14</td><td>42 39</td><td>67 64</td><td>92 89</td></tr> <tr><td>121-118-115-21-18-15-46-43-40-71-68-65</td><td>96 93 90</td><td></td><td></td><td></td></tr> <tr><td>122 119</td><td>22 19</td><td>47 44</td><td>72 69</td><td>97 94</td></tr> <tr><td>123 120</td><td>23 20</td><td>48 45</td><td>73 70</td><td>98 95</td></tr> <tr><td>124</td><td>24</td><td>49</td><td>74</td><td>99</td></tr> <tr><td>125</td><td>25</td><td>50</td><td>75</td><td>100</td></tr> </table> <p> $n101+n7+n38+n69+n100=C$... pt1011 (=pt71); $n105+n9+n38+n67+n96=C$... pt1012 (=pt102); $n121+n17+n38+n59+n80=C$... pt1013 (=pt223); $n125+n19+n38+n57+n76=C$... pt1014 (=pt254); </p> | 101 | 1 | 26 | 51 | 76 | 102 | 2 | 27 | 52 | 77 | 106 103 | 6 3 | 31 28 | 56 53 | 81 78 | 107 104 | 7 4 | 32 29 | 57 54 | 82 79 | 111 108 | 105-11 | 8-5-36-33-30-61-58-55-86-83 | 80 | | 112 109 | 12 9 | 37 34 | 62 59 | 87 84 | 116 113 110 | 16 13 10 41 | 38 35 66 63 60 | 91 88 85 | | 117 114 | 17 14 | 42 39 | 67 64 | 92 89 | 121-118-115-21-18-15-46-43-40-71-68-65 | 96 93 90 | | | | 122 119 | 22 19 | 47 44 | 72 69 | 97 94 | 123 120 | 23 20 | 48 45 | 73 70 | 98 95 | 124 | 24 | 49 | 74 | 99 | 125 | 25 | 50 | 75 | 100 | <table border="0"> <tr><td>102</td><td>2</td><td>27</td><td>52</td><td>77</td></tr> <tr><td>103</td><td>3</td><td>28</td><td>53</td><td>78</td></tr> <tr><td>107 104</td><td>7 4</td><td>32 29</td><td>57 54</td><td>82 79</td></tr> <tr><td>108 105</td><td>8 5</td><td>33 30</td><td>58 55</td><td>83 80</td></tr> <tr><td>112 109 101-12-9-1-37-34-26-62-59-51-87-84-76</td><td>80</td><td></td><td></td><td></td></tr> <tr><td>113 110</td><td>13 10</td><td>38 35</td><td>63 60</td><td>88 85</td></tr> <tr><td>117 114 106</td><td>17 14 6 42 39 31</td><td>67 64 56 92 89 81</td><td></td><td></td></tr> <tr><td>118 115</td><td>18 15</td><td>43 40</td><td>68 65</td><td>93 90</td></tr> <tr><td>122-119-111-22-19-11-47-44-36-72-69-61-97 94 86</td><td></td><td></td><td></td><td></td></tr> <tr><td>123 120</td><td>23 20</td><td>48 45</td><td>73 70</td><td>98 95</td></tr> <tr><td>124 116</td><td>24 16</td><td>49 41</td><td>74 66</td><td>99 91</td></tr> <tr><td>125</td><td>25</td><td>50</td><td>75</td><td>100</td></tr> <tr><td>121</td><td>21</td><td>46</td><td>71</td><td>96</td></tr> </table> <p> $n102+n8+n39+n70+n96=C$... pt1021 (=pt81); $n101+n10+n39+n68+n97=C$... pt1022 (=pt62); $n122+n18+n39+n60+n76=C$... pt1023 (=pt233); $n121+n20+n39+n58+n77=C$... pt1024 (=pt214); </p> | 102 | 2 | 27 | 52 | 77 | 103 | 3 | 28 | 53 | 78 | 107 104 | 7 4 | 32 29 | 57 54 | 82 79 | 108 105 | 8 5 | 33 30 | 58 55 | 83 80 | 112 109 101-12-9-1-37-34-26-62-59-51-87-84-76 | 80 | | | | 113 110 | 13 10 | 38 35 | 63 60 | 88 85 | 117 114 106 | 17 14 6 42 39 31 | 67 64 56 92 89 81 | | | 118 115 | 18 15 | 43 40 | 68 65 | 93 90 | 122-119-111-22-19-11-47-44-36-72-69-61-97 94 86 | | | | | 123 120 | 23 20 | 48 45 | 73 70 | 98 95 | 124 116 | 24 16 | 49 41 | 74 66 | 99 91 | 125 | 25 | 50 | 75 | 100 | 121 | 21 | 46 | 71 | 96 |
| 101 | 1 | 26 | 51 | 76 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 102 | 2 | 27 | 52 | 77 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 106 103 | 6 3 | 31 28 | 56 53 | 81 78 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 107 104 | 7 4 | 32 29 | 57 54 | 82 79 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 111 108 | 105-11 | 8-5-36-33-30-61-58-55-86-83 | 80 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 112 109 | 12 9 | 37 34 | 62 59 | 87 84 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 116 113 110 | 16 13 10 41 | 38 35 66 63 60 | 91 88 85 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 117 114 | 17 14 | 42 39 | 67 64 | 92 89 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 121-118-115-21-18-15-46-43-40-71-68-65 | 96 93 90 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 122 119 | 22 19 | 47 44 | 72 69 | 97 94 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 123 120 | 23 20 | 48 45 | 73 70 | 98 95 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 124 | 24 | 49 | 74 | 99 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 125 | 25 | 50 | 75 | 100 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 102 | 2 | 27 | 52 | 77 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 103 | 3 | 28 | 53 | 78 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 107 104 | 7 4 | 32 29 | 57 54 | 82 79 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 108 105 | 8 5 | 33 30 | 58 55 | 83 80 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 112 109 101-12-9-1-37-34-26-62-59-51-87-84-76 | 80 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 113 110 | 13 10 | 38 35 | 63 60 | 88 85 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 117 114 106 | 17 14 6 42 39 31 | 67 64 56 92 89 81 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 118 115 | 18 15 | 43 40 | 68 65 | 93 90 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 122-119-111-22-19-11-47-44-36-72-69-61-97 94 86 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 123 120 | 23 20 | 48 45 | 73 70 | 98 95 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 124 116 | 24 16 | 49 41 | 74 66 | 99 91 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 125 | 25 | 50 | 75 | 100 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 121 | 21 | 46 | 71 | 96 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

How many different cubes in all can we make by these styles of Pan-magic Shift?
Yes, 125 in all.

How many different conditions in all do we have to define for the Pan-triagonals at the first definition stage, then? Do we need as many as 500 (=125 x 4)?

No, not so many. If we remove repetitions of the same contents as many as we can, we need only the 100 (=25 x 4) different conditions for Pan-triagonals.

With those 100 Pan-triagonal definitions, we can use any style of Pan-magic Shift anytime and make all the different 125 Pan-magic Cubes always just as we have wanted. This is the basic concept of our Pan-triagonal Magic Cubes of Order 5.

2. How to define this type of object with the Basic Form and Basic Equations:

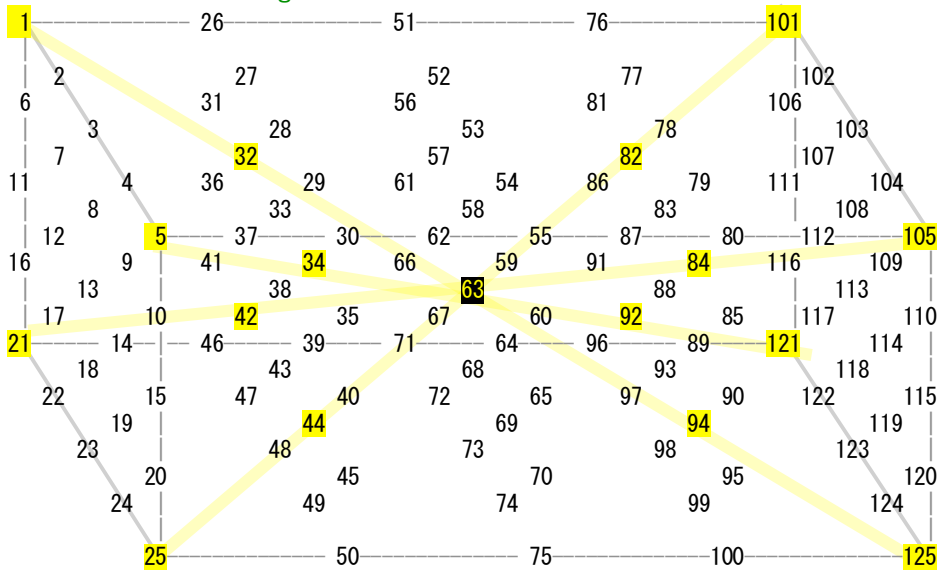
Let me show you the definitions with the diagram and list of equations as usual.

** Basic Conditions for Magic Cubes of Order 5: **

| | | | | |
|---------------------|--|------------------------|--|--------------------------|
| $n1+n2+n3+n4+n5=C;$ | | $n1+n6+n11+n16+n21=C;$ | | $n1+n26+n51+n76+n101=C;$ |
|---------------------|--|------------------------|--|--------------------------|

| | | |
|-------------------------------|-------------------------------|----------------------------|
| $n6+n7+n8+n9+n10=C;$ | $n2+n7+n12+n17+n22=C;$ | $n2+n27+n52+n77+n102=C;$ |
| $n11+n12+n13+n14+n15=C;$ | $n3+n8+n13+n18+n23=C;$ | $n3+n28+n53+n78+n103=C;$ |
| $n16+n17+n18+n19+n20=C;$ | $n4+n9+n14+n19+n24=C;$ | $n4+n29+n54+n79+n104=C;$ |
| $n21+n22+n23+n24+n25=C;$ | $n5+n10+n15+n20+n25=C;$ | $n5+n30+n55+n80+n105=C;$ |
| $n26+n27+n28+n29+n30=C;$ | $n26+n31+n36+n41+n46=C;$ | $n6+n31+n56+n81+n106=C;$ |
| $n31+n32+n33+n34+n35=C;$ | $n27+n32+n37+n42+n47=C;$ | $n7+n32+n57+n82+n107=C;$ |
| $n36+n37+n38+n39+n40=C;$ | $n28+n33+n38+n43+n48=C;$ | $n8+n33+n58+n83+n108=C;$ |
| $n41+n42+n43+n44+n45=C;$ | $n29+n34+n39+n44+n49=C;$ | $n9+n34+n59+n84+n109=C;$ |
| $n46+n47+n48+n49+n50=C;$ | $n30+n35+n40+n45+n50=C;$ | $n10+n35+n60+n85+n110=C;$ |
| $n51+n52+n53+n54+n55=C;$ | $n51+n56+n61+n66+n71=C;$ | $n11+n36+n61+n86+n111=C;$ |
| $n56+n57+n58+n59+n60=C;$ | $n52+n57+n62+n67+n72=C;$ | $n12+n37+n62+n87+n112=C;$ |
| $n61+n62+n63+n64+n65=C;$ | $n53+n58+n63+n68+n73=C;$ | $n13+n38+n63+n88+n113=C;$ |
| $n66+n67+n68+n69+n70=C;$ | $n54+n59+n64+n69+n74=C;$ | $n14+n39+n64+n89+n114=C;$ |
| $n71+n72+n73+n74+n75=C;$ | $n55+n60+n65+n70+n75=C;$ | $n15+n40+n65+n90+n115=C;$ |
| $n76+n77+n78+n79+n80=C;$ | $n76+n81+n86+n91+n96=C;$ | $n16+n41+n66+n91+n116=C;$ |
| $n81+n82+n83+n84+n85=C;$ | $n77+n82+n87+n92+n97=C;$ | $n17+n42+n67+n92+n117=C;$ |
| $n86+n87+n88+n89+n90=C;$ | $n78+n83+n88+n93+n98=C;$ | $n18+n43+n68+n93+n118=C;$ |
| $n91+n92+n93+n94+n95=C;$ | $n79+n84+n89+n94+n99=C;$ | $n19+n44+n69+n94+n119=C;$ |
| $n96+n97+n98+n99+n100=C;$ | $n80+n85+n90+n95+n100=C;$ | $n20+n45+n70+n95+n120=C;$ |
| $n101+n102+n103+n104+n105=C;$ | $n101+n106+n111+n116+n121=C;$ | $n21+n46+n71+n96+n121=C;$ |
| $n106+n107+n108+n109+n110=C;$ | $n102+n107+n112+n117+n122=C;$ | $n22+n47+n72+n97+n122=C;$ |
| $n111+n112+n113+n114+n115=C;$ | $n103+n108+n113+n118+n123=C;$ | $n23+n48+n73+n98+n123=C;$ |
| $n116+n117+n118+n119+n120=C;$ | $n104+n109+n114+n119+n124=C;$ | $n24+n49+n74+n99+n124=C;$ |
| $n121+n122+n123+n124+n125=C;$ | $n105+n110+n115+n120+n125=C;$ | $n25+n50+n75+n100+n125=C;$ |

**** Basic Form for Magic Cubes of Order 5 ****



**** The 100 Pan-triagonal Conditions for Pan-magic Cubes of Order 5: ****

| | | | |
|--------------------------|-----------|--------------------------|-----------|
| $n1+n32+n63+n94+n125=C$ | ... pt11; | $n5+n34+n63+n92+n121=C$ | ... pt12; |
| $n21+n42+n63+n84+n105=C$ | ... pt13; | $n25+n44+n63+n82+n101=C$ | ... pt14; |
| $n2+n33+n64+n95+n121=C$ | ... pt21; | $n1+n35+n64+n93+n122=C$ | ... pt22; |
| $n22+n43+n64+n85+n101=C$ | ... pt23; | $n21+n45+n64+n83+n102=C$ | ... pt24; |
| $n3+n34+n65+n91+n122=C$ | ... pt31; | $n2+n31+n65+n94+n123=C$ | ... pt32; |
| $n23+n44+n65+n81+n102=C$ | ... pt33; | $n22+n41+n65+n84+n103=C$ | ... pt34; |
| $n4+n35+n61+n92+n123=C$ | ... pt41; | $n3+n32+n61+n95+n124=C$ | ... pt42; |
| $n24+n45+n61+n82+n103=C$ | ... pt43; | $n23+n42+n61+n85+n104=C$ | ... pt44; |
| $n5+n31+n62+n93+n124=C$ | ... pt51; | $n4+n33+n62+n91+n125=C$ | ... pt52; |
| $n25+n41+n62+n83+n104=C$ | ... pt53; | $n24+n43+n62+n81+n105=C$ | ... pt54; |
| $n6+n37+n68+n99+n105=C$ | ... pt61; | $n10+n39+n68+n97+n101=C$ | ... pt62; |
| $n1+n47+n68+n89+n110=C$ | ... pt63; | $n5+n49+n68+n87+n106=C$ | ... pt64; |
| $n7+n38+n69+n100+n101=C$ | ... pt71; | $n6+n40+n69+n98+n102=C$ | ... pt72; |
| $n2+n48+n69+n90+n106=C$ | ... pt73; | $n1+n50+n69+n88+n107=C$ | ... pt74; |

| | | | |
|-------------------------|------------|-------------------------|------------|
| n8+n39+n70+n96+n102=C | ... pt81; | n7+n36+n70+n99+n103=C | ... pt82; |
| n3+n49+n70+n86+n107=C | ... pt83; | n2+n46+n70+n89+n108=C | ... pt84; |
| n9+n40+n66+n97+n103=C | ... pt91; | n8+n37+n66+n100+n104=C | ... pt92; |
| n4+n50+n66+n87+n108=C | ... pt93; | n3+n47+n66+n90+n109=C | ... pt94; |
| n10+n36+n67+n98+n104=C | ... pt101; | n9+n38+n67+n96+n105=C | ... pt102; |
| n5+n46+n67+n88+n109=C | ... pt103; | n4+n48+n67+n86+n110=C | ... pt104; |
| n11+n42+n73+n79+n110=C | ... pt111; | n15+n44+n73+n77+n106=C | ... pt112; |
| n6+n27+n73+n94+n115=C | ... pt113; | n10+n29+n73+n92+n111=C | ... pt114; |
| n12+n43+n74+n80+n106=C | ... pt121; | n11+n45+n74+n78+n107=C | ... pt122; |
| n7+n28+n74+n95+n111=C | ... pt123; | n6+n30+n74+n93+n112=C | ... pt124; |
| n13+n44+n75+n76+n107=C | ... pt131; | n12+n41+n75+n79+n108=C | ... pt132; |
| n8+n29+n75+n91+n112=C | ... pt133; | n7+n26+n75+n94+n113=C | ... pt134; |
| n14+n45+n71+n77+n108=C | ... pt141; | n13+n42+n71+n80+n109=C | ... pt142; |
| n9+n30+n71+n92+n113=C | ... pt143; | n8+n27+n71+n95+n114=C | ... pt144; |
| n15+n41+n72+n78+n109=C | ... pt151; | n14+n43+n72+n76+n110=C | ... pt152; |
| n10+n26+n72+n93+n114=C | ... pt153; | n9+n28+n72+n91+n115=C | ... pt154; |
| n16+n47+n53+n84+n115=C | ... pt161; | n20+n49+n53+n82+n111=C | ... pt162; |
| n11+n32+n53+n99+n120=C | ... pt163; | n15+n34+n53+n97+n116=C | ... pt164; |
| n17+n48+n54+n85+n111=C | ... pt171; | n16+n50+n54+n83+n112=C | ... pt172; |
| n12+n33+n54+n100+n116=C | ... pt173; | n11+n35+n54+n98+n117=C | ... pt174; |
| n18+n49+n55+n81+n112=C | ... pt181; | n17+n46+n55+n84+n113=C | ... pt182; |
| n13+n34+n55+n96+n117=C | ... pt183; | n12+n31+n55+n99+n118=C | ... pt184; |
| n19+n50+n51+n82+n113=C | ... pt191; | n18+n47+n51+n85+n114=C | ... pt192; |
| n14+n35+n51+n97+n118=C | ... pt193; | n13+n32+n51+n100+n119=C | ... pt194; |
| n20+n46+n52+n83+n114=C | ... pt201; | n19+n48+n52+n81+n115=C | ... pt202; |
| n15+n31+n52+n98+n119=C | ... pt203; | n14+n33+n52+n96+n120=C | ... pt204; |
| n21+n27+n58+n89+n120=C | ... pt211; | n25+n29+n58+n87+n116=C | ... pt212; |
| n16+n37+n58+n79+n125=C | ... pt213; | n20+n39+n58+n77+n121=C | ... pt214; |
| n22+n28+n59+n90+n116=C | ... pt221; | n21+n30+n59+n88+n117=C | ... pt222; |
| n17+n38+n59+n80+n121=C | ... pt223; | n16+n40+n59+n78+n122=C | ... pt224; |
| n23+n29+n60+n86+n117=C | ... pt231; | n22+n26+n60+n89+n118=C | ... pt232; |
| n18+n39+n60+n76+n122=C | ... pt233; | n17+n36+n60+n79+n123=C | ... pt234; |
| n24+n30+n56+n87+n118=C | ... pt241; | n23+n27+n56+n90+n119=C | ... pt242; |
| n19+n40+n56+n77+n123=C | ... pt243; | n18+n37+n56+n80+n124=C | ... pt244; |
| n25+n26+n57+n88+n119=C | ... pt251; | n24+n28+n57+n86+n120=C | ... pt252; |
| n20+n36+n57+n78+n124=C | ... pt253; | n19+n38+n57+n76+n125=C | ... pt254; |

This time we don't have anything like Self-complementary Pairs to be set at the same time in every single procedure. We have nothing like the invariable value for the variable n63 at the geometrical center of our cube, either. n63 may take any value now.

3. How to make our 'Latin Cubes' of Order 5 for the "Complete Euler Type":

Let's build the "Complete Euler Cubes" of Order 5 for the Pan-triagonal type here, using the Positional Number System of Base 5 (5-th Increment Number System).

Before all we have to make 'Latin Cubes' of Order 5, to combine any three of them and suppose the set to be the Simulated Decomposed Layer Units of our object.

The Latin Cubes are defined almost in the same way as above, but you must only change the values of Constant Sums as C=10 and SC=4.

On top of that, Latin Cubes must always be made under such the strict rules as:

- (1) Any Latin Cube must be simply made up of 5 numerical letters: {0, 1, 2, 3 and 4}. Each letter should appear as often as 25 times, no more and no less.
- (2) Each row, each column and each pillar of Latin Cubes must be made up of {0, 1, 2, 3 and 4} using each number strictly once.

Neither duplication nor lack of any number must be found in it.

These strict conditions should make the constant sum of each row, column and pillar of our final object always realized:

$$((0+1+2+3+4) \times 5_{(Dec)} + (0+1+2+3+4)) \times 5_{(Dec)} + (0+1+2+3+4) = 310_{(Dec)}$$

(in Mathematical Expression of Cube)

(3) Each of the Pan-triagonals must also be made up of 5 numbers: {0, 1, 2, 3 and 4} using each one strictly once. Neither duplication nor lack of any number is permitted.

4. What the 'Latin Cubes' look like:

The next list shows some sample solutions of Latin Cubes of Order 5 for the Pan-triagonal Type, made under the Positional Number System of Base 5.

| 0 | 1 | 2 | 3 | 4 | 1/ |
|---|---|---|---|---|----|
| 0 | 1 | 2 | 3 | 4 | 0 |
| 1 | 2 | 3 | 4 | 0 | 1 |
| 2 | 3 | 4 | 0 | 1 | 2 |
| 3 | 4 | 0 | 1 | 2 | 3 |
| 4 | 0 | 1 | 2 | 3 | 4 |

| 0 | 2 | 1 | 3 | 4 | 25/ |
|---|---|---|---|---|-----|
| 0 | 2 | 1 | 3 | 4 | 0 |
| 2 | 1 | 3 | 4 | 0 | 2 |
| 1 | 3 | 4 | 0 | 2 | 1 |
| 3 | 4 | 0 | 2 | 1 | 3 |
| 4 | 0 | 2 | 1 | 3 | 4 |

| 0 | 3 | 1 | 2 | 4 | 49/ |
|---|---|---|---|---|-----|
| 0 | 3 | 1 | 2 | 4 | 0 |
| 3 | 1 | 2 | 4 | 0 | 3 |
| 1 | 2 | 4 | 0 | 3 | 1 |
| 2 | 4 | 0 | 3 | 1 | 2 |
| 4 | 0 | 3 | 1 | 2 | 4 |

I want you to watch these samples and check if each of them is successfully made under those strict conditions above. Will you especially examine each content of rows, columns, pillars and all pan-triagonals? And finally check every two adjacent numbers sitting next in all seven lines to see whether they are the same or not.

5. How to make the Latin Cubes of Order 5

How can we make such the Latin Cubes as shown above, then? How many of them can we make in all?

I plan to make them here by our "New Euler's Method" under the Positional Number System of Base 5.

Since we can only set only one variable in each step, we must have 125 steps in all for all variables consequently. We must also check whether each variable obeys the strict Latin Rule or not, precisely on all the seven lines such as each row, column, pillar and every four pan-triagonals in each step. It should be very hard for us to write such a long, complicated program, as you guess.

It is the fact that I had to develop my own new technique, so called "Computer Assisted Programming". It makes my computer assist me to dictate the program routines with rich contents as accurate as possible. I wrote a kind of 'meta-program' that should dictate the actual program we need for our purpose.

Let me list out only the core part of my actual program here as follows.

```
/**/  
short cnt0, cnt1, cnt2, cnt3;  
short nm[126];  
short bc[176][5]; //For the 25 Rows, 25 Columns, 25 Pillars and 100 Pan-triagonals  
short d[4][129]; //For the Contemporary Data for listing out 3 Answers  
short tluh[481]; //For the selection of Standard Solutions checking the High Layer  
short tlu[481][126]; //For storing all the Latin Units Composed  
char mtc[481][481]; //For the Compatibility Data of any two Units  
/**/  
/** Program Modules for 'Latin Cubes' 5x5x5 of the Pan-triagonal Type  
dictated by Kanji Setsuda on May 30, 2010 with MacOSX & Xcode3.1.2 **/  
/* Level 1: */  
/* Set N1 */  
void stp01(){  
short a;
```



```

for(a=0;a<5;a++){
  if((bc[1][a]==0)&&(bc[2][a]==0)&&(bc[3][a]==0)&&(bc[76][a]==0)){
    if((bc[81][a]==0)&&(bc[98][a]==0)&&(bc[103][a]==0)){
      nm[1]=a;
      bc[1][a]=1; bc[2][a]=1; bc[3][a]=1; bc[76][a]=1;
      bc[81][a]=1; bc[98][a]=1; bc[103][a]=1;
      stp02();
      bc[1][a]=0; bc[2][a]=0; bc[3][a]=0; bc[76][a]=0;
      bc[81][a]=0; bc[98][a]=0; bc[103][a]=0;}}
}
}
/* Set N2 */
void stp02(){
  short a;
  for(a=0;a<5;a++){
    if((bc[1][a]==0)&&(bc[5][a]==0)&&(bc[6][a]==0)&&(bc[80][a]==0)){
      if((bc[85][a]==0)&&(bc[102][a]==0)&&(bc[107][a]==0)){
        nm[2]=a;
        bc[1][a]=1; bc[5][a]=1; bc[6][a]=1; bc[80][a]=1;
        bc[85][a]=1; bc[102][a]=1; bc[107][a]=1; cnt2=0;
        stp03();
        bc[1][a]=0; bc[5][a]=0; bc[6][a]=0; bc[80][a]=0;
        bc[85][a]=0; bc[102][a]=0; bc[107][a]=0;}}
  }
}
/* Set N3 */
void stp03(){
  short a;
  for(a=0;a<5;a++){
    if((bc[1][a]==0)&&(bc[8][a]==0)&&(bc[9][a]==0)&&(bc[84][a]==0)){
      if((bc[89][a]==0)&&(bc[106][a]==0)&&(bc[111][a]==0)){
        nm[3]=a;
        bc[1][a]=1; bc[8][a]=1; bc[9][a]=1; bc[84][a]=1;
        bc[89][a]=1; bc[106][a]=1; bc[111][a]=1;
        stp04();
        bc[1][a]=0; bc[8][a]=0; bc[9][a]=0; bc[84][a]=0;
        bc[89][a]=0; bc[106][a]=0; bc[111][a]=0;}}
  }
}
/* Set N4 */
void stp04(){
  short a;
  for(a=0;a<5;a++){
    if((bc[1][a]==0)&&(bc[11][a]==0)&&(bc[12][a]==0)&&(bc[88][a]==0)){
      if((bc[93][a]==0)&&(bc[110][a]==0)&&(bc[115][a]==0)){
        nm[4]=a;
        bc[1][a]=1; bc[11][a]=1; bc[12][a]=1; bc[88][a]=1;
        bc[93][a]=1; bc[110][a]=1; bc[115][a]=1;
        stp05();
        bc[1][a]=0; bc[11][a]=0; bc[12][a]=0; bc[88][a]=0;
        bc[93][a]=0; bc[110][a]=0; bc[115][a]=0;}}
  }
}
/* Set N5 */
void stp05(){
  short a;
  for(a=0;a<5;a++){
    if((bc[1][a]==0)&&(bc[14][a]==0)&&(bc[15][a]==0)&&(bc[77][a]==0)){
      if((bc[92][a]==0)&&(bc[99][a]==0)&&(bc[114][a]==0)){
        nm[5]=a;
        bc[1][a]=1; bc[14][a]=1; bc[15][a]=1; bc[77][a]=1;
        bc[92][a]=1; bc[99][a]=1; bc[114][a]=1;
        stp06();
        bc[1][a]=0; bc[14][a]=0; bc[15][a]=0; bc[77][a]=0;
        bc[92][a]=0; bc[99][a]=0; bc[114][a]=0;}}
  }
}

```

```

}
}
/* Set N6 */
void stp06(){
short a;
for(a=0;a<5;a++){
if((bc[2][a]==0)&&(bc[4][a]==0)&&(bc[18][a]==0)&&(bc[96][a]==0)){
if((bc[101][a]==0)&&(bc[118][a]==0)&&(bc[123][a]==0)){
nm[6]=a;
bc[2][a]=1; bc[4][a]=1; bc[18][a]=1; bc[96][a]=1;
bc[101][a]=1; bc[118][a]=1; bc[123][a]=1;
stp07();
bc[2][a]=0; bc[4][a]=0; bc[18][a]=0; bc[96][a]=0;
bc[101][a]=0; bc[118][a]=0; bc[123][a]=0;}}
}
}
/* Set N7 */
void stp07(){
short a;
for(a=0;a<5;a++){
if((bc[4][a]==0)&&(bc[5][a]==0)&&(bc[21][a]==0)&&(bc[100][a]==0)){
if((bc[105][a]==0)&&(bc[122][a]==0)&&(bc[127][a]==0)){
nm[7]=a;
bc[4][a]=1; bc[5][a]=1; bc[21][a]=1; bc[100][a]=1;
bc[105][a]=1; bc[122][a]=1; bc[127][a]=1;
stp08();
bc[4][a]=0; bc[5][a]=0; bc[21][a]=0; bc[100][a]=0;
bc[105][a]=0; bc[122][a]=0; bc[127][a]=0;}}
}
}
/* Set N8 */
void stp08(){
short a;
for(a=0;a<5;a++){
if((bc[4][a]==0)&&(bc[8][a]==0)&&(bc[24][a]==0)&&(bc[104][a]==0)){
if((bc[109][a]==0)&&(bc[126][a]==0)&&(bc[131][a]==0)){
nm[8]=a;
bc[4][a]=1; bc[8][a]=1; bc[24][a]=1; bc[104][a]=1;
bc[109][a]=1; bc[126][a]=1; bc[131][a]=1;
stp09();
bc[4][a]=0; bc[8][a]=0; bc[24][a]=0; bc[104][a]=0;
bc[109][a]=0; bc[126][a]=0; bc[131][a]=0;}}
}
}
/* Set N9 */
void stp09(){
short a;
for(a=0;a<5;a++){
if((bc[4][a]==0)&&(bc[11][a]==0)&&(bc[27][a]==0)&&(bc[108][a]==0)){
if((bc[113][a]==0)&&(bc[130][a]==0)&&(bc[135][a]==0)){
nm[9]=a;
bc[4][a]=1; bc[11][a]=1; bc[27][a]=1; bc[108][a]=1;
bc[113][a]=1; bc[130][a]=1; bc[135][a]=1;
stp10();
bc[4][a]=0; bc[11][a]=0; bc[27][a]=0; bc[108][a]=0;
bc[113][a]=0; bc[130][a]=0; bc[135][a]=0;}}
}
}
/* Set N10 */
void stp10(){
short a;
for(a=0;a<5;a++){
if((bc[4][a]==0)&&(bc[14][a]==0)&&(bc[30][a]==0)&&(bc[97][a]==0)){
if((bc[112][a]==0)&&(bc[119][a]==0)&&(bc[134][a]==0)){
nm[10]=a;

```

```

        bc[4][a]=1; bc[14][a]=1; bc[30][a]=1; bc[97][a]=1;
        bc[112][a]=1; bc[119][a]=1; bc[134][a]=1;
        stp11();
        bc[4][a]=0; bc[14][a]=0; bc[30][a]=0; bc[97][a]=0;
        bc[112][a]=0; bc[119][a]=0; bc[134][a]=0;}}
    }
}
/* Set N11 */
void stp11(){
    short a;
    for(a=0;a<5;a++){
        if((bc[2][a]==0)&&(bc[7][a]==0)&&(bc[33][a]==0)&&(bc[116][a]==0)){
            if((bc[121][a]==0)&&(bc[138][a]==0)&&(bc[143][a]==0)){
                nm[11]=a;
                bc[2][a]=1; bc[7][a]=1; bc[33][a]=1; bc[116][a]=1;
                bc[121][a]=1; bc[138][a]=1; bc[143][a]=1;
                stp12();
                bc[2][a]=0; bc[7][a]=0; bc[33][a]=0; bc[116][a]=0;
                bc[121][a]=0; bc[138][a]=0; bc[143][a]=0;}}
    }
}
/* Set N12 */
void stp12(){
    short a;
    for(a=0;a<5;a++){
        if((bc[5][a]==0)&&(bc[7][a]==0)&&(bc[36][a]==0)&&(bc[120][a]==0)){
            if((bc[125][a]==0)&&(bc[142][a]==0)&&(bc[147][a]==0)){
                nm[12]=a;
                bc[5][a]=1; bc[7][a]=1; bc[36][a]=1; bc[120][a]=1;
                bc[125][a]=1; bc[142][a]=1; bc[147][a]=1;
                stp13();
                bc[5][a]=0; bc[7][a]=0; bc[36][a]=0; bc[120][a]=0;
                bc[125][a]=0; bc[142][a]=0; bc[147][a]=0;}}
    }
}
/* Set N13 */
void stp13(){
    short a;
    for(a=0;a<5;a++){
        if((bc[7][a]==0)&&(bc[8][a]==0)&&(bc[39][a]==0)&&(bc[124][a]==0)){
            if((bc[129][a]==0)&&(bc[146][a]==0)&&(bc[151][a]==0)){
                nm[13]=a;
                bc[7][a]=1; bc[8][a]=1; bc[39][a]=1; bc[124][a]=1;
                bc[129][a]=1; bc[146][a]=1; bc[151][a]=1;
                stp14();
                bc[7][a]=0; bc[8][a]=0; bc[39][a]=0; bc[124][a]=0;
                bc[129][a]=0; bc[146][a]=0; bc[151][a]=0;}}
    }
}
/* Set N14 */
void stp14(){
    short a;
    for(a=0;a<5;a++){
        if((bc[7][a]==0)&&(bc[11][a]==0)&&(bc[42][a]==0)&&(bc[128][a]==0)){
            if((bc[133][a]==0)&&(bc[150][a]==0)&&(bc[155][a]==0)){
                nm[14]=a;
                bc[7][a]=1; bc[11][a]=1; bc[42][a]=1; bc[128][a]=1;
                bc[133][a]=1; bc[150][a]=1; bc[155][a]=1;
                stp15();
                bc[7][a]=0; bc[11][a]=0; bc[42][a]=0; bc[128][a]=0;
                bc[133][a]=0; bc[150][a]=0; bc[155][a]=0;}}
    }
}
/* Set N15 */
void stp15(){

```

```

short a;
for(a=0;a<5;a++){
  if((bc[7][a]==0)&&(bc[14][a]==0)&&(bc[45][a]==0)&&(bc[117][a]==0)){
    if((bc[132][a]==0)&&(bc[139][a]==0)&&(bc[154][a]==0)){
      nm[15]=a;
      bc[7][a]=1; bc[14][a]=1; bc[45][a]=1; bc[117][a]=1;
      bc[132][a]=1; bc[139][a]=1; bc[154][a]=1;
      stp16();
      bc[7][a]=0; bc[14][a]=0; bc[45][a]=0; bc[117][a]=0;
      bc[132][a]=0; bc[139][a]=0; bc[154][a]=0;}}
}
}
/* Set N16 */
void stp16(){
  short a;
  for(a=0;a<5;a++){
    if((bc[2][a]==0)&&(bc[10][a]==0)&&(bc[48][a]==0)&&(bc[136][a]==0)){
      if((bc[141][a]==0)&&(bc[158][a]==0)&&(bc[163][a]==0)){
        nm[16]=a;
        bc[2][a]=1; bc[10][a]=1; bc[48][a]=1; bc[136][a]=1;
        bc[141][a]=1; bc[158][a]=1; bc[163][a]=1;
        stp17();
        bc[2][a]=0; bc[10][a]=0; bc[48][a]=0; bc[136][a]=0;
        bc[141][a]=0; bc[158][a]=0; bc[163][a]=0;}}
  }
}
/* Set N17 */
void stp17(){
  short a;
  for(a=0;a<5;a++){
    if((bc[5][a]==0)&&(bc[10][a]==0)&&(bc[51][a]==0)&&(bc[140][a]==0)){
      if((bc[145][a]==0)&&(bc[162][a]==0)&&(bc[167][a]==0)){
        nm[17]=a;
        bc[5][a]=1; bc[10][a]=1; bc[51][a]=1; bc[140][a]=1;
        bc[145][a]=1; bc[162][a]=1; bc[167][a]=1;
        stp18();
        bc[5][a]=0; bc[10][a]=0; bc[51][a]=0; bc[140][a]=0;
        bc[145][a]=0; bc[162][a]=0; bc[167][a]=0;}}
  }
}
/* Set N18 */
void stp18(){
  short a;
  for(a=0;a<5;a++){
    if((bc[8][a]==0)&&(bc[10][a]==0)&&(bc[54][a]==0)&&(bc[144][a]==0)){
      if((bc[149][a]==0)&&(bc[166][a]==0)&&(bc[171][a]==0)){
        nm[18]=a;
        bc[8][a]=1; bc[10][a]=1; bc[54][a]=1; bc[144][a]=1;
        bc[149][a]=1; bc[166][a]=1; bc[171][a]=1;
        stp19();
        bc[8][a]=0; bc[10][a]=0; bc[54][a]=0; bc[144][a]=0;
        bc[149][a]=0; bc[166][a]=0; bc[171][a]=0;}}
  }
}
/* Set N19 */
void stp19(){
  short a;
  for(a=0;a<5;a++){
    if((bc[10][a]==0)&&(bc[11][a]==0)&&(bc[57][a]==0)&&(bc[148][a]==0)){
      if((bc[153][a]==0)&&(bc[170][a]==0)&&(bc[175][a]==0)){
        nm[19]=a;
        bc[10][a]=1; bc[11][a]=1; bc[57][a]=1; bc[148][a]=1;
        bc[153][a]=1; bc[170][a]=1; bc[175][a]=1;
        stp20();
        bc[10][a]=0; bc[11][a]=0; bc[57][a]=0; bc[148][a]=0;

```

```

        bc[153][a]=0; bc[170][a]=0; bc[175][a]=0;}}
    }
}
/* Set N20 */
void stp20(){
    short a;
    for(a=0;a<5;a++){
        if((bc[10][a]==0)&&(bc[14][a]==0)&&(bc[60][a]==0)&&(bc[137][a]==0)){
            if((bc[152][a]==0)&&(bc[159][a]==0)&&(bc[174][a]==0)){
                nm[20]=a;
                bc[10][a]=1; bc[14][a]=1; bc[60][a]=1; bc[137][a]=1;
                bc[152][a]=1; bc[159][a]=1; bc[174][a]=1;
                stp21();
                bc[10][a]=0; bc[14][a]=0; bc[60][a]=0; bc[137][a]=0;
                bc[152][a]=0; bc[159][a]=0; bc[174][a]=0;}}
        }
    }
}
/* Set N21 */
void stp21(){
    short a;
    for(a=0;a<5;a++){
        if((bc[2][a]==0)&&(bc[13][a]==0)&&(bc[63][a]==0)&&(bc[78][a]==0)){
            if((bc[83][a]==0)&&(bc[156][a]==0)&&(bc[161][a]==0)){
                nm[21]=a;
                bc[2][a]=1; bc[13][a]=1; bc[63][a]=1; bc[78][a]=1;
                bc[83][a]=1; bc[156][a]=1; bc[161][a]=1;
                stp22();
                bc[2][a]=0; bc[13][a]=0; bc[63][a]=0; bc[78][a]=0;
                bc[83][a]=0; bc[156][a]=0; bc[161][a]=0;}}
        }
    }
}
/* Set N22 */
void stp22(){
    short a;
    for(a=0;a<5;a++){
        if((bc[5][a]==0)&&(bc[13][a]==0)&&(bc[66][a]==0)&&(bc[82][a]==0)){
            if((bc[87][a]==0)&&(bc[160][a]==0)&&(bc[165][a]==0)){
                nm[22]=a;
                bc[5][a]=1; bc[13][a]=1; bc[66][a]=1; bc[82][a]=1;
                bc[87][a]=1; bc[160][a]=1; bc[165][a]=1;
                stp23();
                bc[5][a]=0; bc[13][a]=0; bc[66][a]=0; bc[82][a]=0;
                bc[87][a]=0; bc[160][a]=0; bc[165][a]=0;}}
        }
    }
}
/* Set N23 */
void stp23(){
    short a;
    for(a=0;a<5;a++){
        if((bc[8][a]==0)&&(bc[13][a]==0)&&(bc[69][a]==0)&&(bc[86][a]==0)){
            if((bc[91][a]==0)&&(bc[164][a]==0)&&(bc[169][a]==0)){
                nm[23]=a;
                bc[8][a]=1; bc[13][a]=1; bc[69][a]=1; bc[86][a]=1;
                bc[91][a]=1; bc[164][a]=1; bc[169][a]=1;
                stp24();
                bc[8][a]=0; bc[13][a]=0; bc[69][a]=0; bc[86][a]=0;
                bc[91][a]=0; bc[164][a]=0; bc[169][a]=0;}}
        }
    }
}
/* Set N24 */
void stp24(){
    short a;
    for(a=0;a<5;a++){
        if((bc[11][a]==0)&&(bc[13][a]==0)&&(bc[72][a]==0)&&(bc[90][a]==0)){
            if((bc[95][a]==0)&&(bc[168][a]==0)&&(bc[173][a]==0)){

```

```

        nm[24]=a;
        bc[11][a]=1; bc[13][a]=1; bc[72][a]=1; bc[90][a]=1;
        bc[95][a]=1; bc[168][a]=1; bc[173][a]=1;
        stp25();
        bc[11][a]=0; bc[13][a]=0; bc[72][a]=0; bc[90][a]=0;
        bc[95][a]=0; bc[168][a]=0; bc[173][a]=0;}}
    }
}
/* Set N25 */
void stp25(){
    short a;
    for(a=0;a<5;a++){
        if((bc[13][a]==0)&&(bc[14][a]==0)&&(bc[75][a]==0)&&(bc[79][a]==0)){
            if((bc[94][a]==0)&&(bc[157][a]==0)&&(bc[172][a]==0)){
                nm[25]=a;
                bc[13][a]=1; bc[14][a]=1; bc[75][a]=1; bc[79][a]=1;
                bc[94][a]=1; bc[157][a]=1; bc[172][a]=1;
                stp26();
                bc[13][a]=0; bc[14][a]=0; bc[75][a]=0; bc[79][a]=0;
                bc[94][a]=0; bc[157][a]=0; bc[172][a]=0;}}
        }
    }
}
/* Level 2: */
/* Set N26 */
void stp26(){
    short a;
    for(a=0;a<5;a++){
        if((bc[3][a]==0)&&(bc[16][a]==0)&&(bc[17][a]==0)&&(bc[127][a]==0)){
            if((bc[134][a]==0)&&(bc[165][a]==0)&&(bc[172][a]==0)){
                nm[26]=a;
                bc[3][a]=1; bc[16][a]=1; bc[17][a]=1; bc[127][a]=1;
                bc[134][a]=1; bc[165][a]=1; bc[172][a]=1;
                stp27();
                bc[3][a]=0; bc[16][a]=0; bc[17][a]=0; bc[127][a]=0;
                bc[134][a]=0; bc[165][a]=0; bc[172][a]=0;}}
        }
    }
}
/**/
/* ...(skip)... */
/**/
/* Set N124 */
void stp124(){
    short a;
    for(a=0;a<5;a++){
        if((bc[71][a]==0)&&(bc[72][a]==0)&&(bc[73][a]==0)&&(bc[89][a]==0)){
            if((bc[92][a]==0)&&(bc[171][a]==0)&&(bc[174][a]==0)){
                nm[124]=a;
                bc[71][a]=1; bc[72][a]=1; bc[73][a]=1; bc[89][a]=1;
                bc[92][a]=1; bc[171][a]=1; bc[174][a]=1;
                stp125();
                bc[71][a]=0; bc[72][a]=0; bc[73][a]=0; bc[89][a]=0;
                bc[92][a]=0; bc[171][a]=0; bc[174][a]=0;}}
        }
    }
}
/* Set N125 */
void stp125(){
    short a;
    for(a=0;a<5;a++){
        if((bc[73][a]==0)&&(bc[74][a]==0)&&(bc[75][a]==0)&&(bc[76][a]==0)){
            if((bc[93][a]==0)&&(bc[158][a]==0)&&(bc[175][a]==0)){
                nm[125]=a;
                bc[73][a]=1; bc[74][a]=1; bc[75][a]=1; bc[76][a]=1;
                bc[93][a]=1; bc[158][a]=1; bc[175][a]=1;
                recordans();
                bc[73][a]=0; bc[74][a]=0; bc[75][a]=0; bc[76][a]=0;
            }
        }
    }
}

```

```

        bc[93][a]=0; bc[158][a]=0; bc[175][a]=0;}}
    }
}
/**/
/* Record the Latin Units */
void recordans(){
    short n;
    tlu[cnt0][0]=cnt0+1;
    for(n=1;n<126;n++){tlu[cnt0][n]=nm[n];}
    if((nm[1]<=nm[5])&&(nm[1]<=nm[21])&&(nm[1]<=nm[25])&&(nm[1]<=nm[101])&&(nm[1]<=nm[105])){
        if((nm[1]<=nm[121])&&(nm[1]<=nm[125])&&(nm[2]<=nm[6])&&(nm[6]<=nm[26])){tluh[cnt0]++; cnt1++;}
        cnt0++; cnt2++;
        if(cnt2==1){
            d[cnt3][0]=cnt0; d[cnt3+1][0]=0;
            for(n=1;n<126;n++){d[cnt3][n]=nm[n];}
            cnt3++; if(cnt3==3){prdlu(cnt3); cnt3=0;}
        }
    }
}
/**/
/* Make the Reference Table */
void mkreftbl(){
    short m,l,n,t,d;
    /* Measure How Similar each Pair is. */
    for(m=0;m<cnt0;m++){
        for(l=0;l<cnt0;l++){
            t=0;
            for(n=1;n<126;n++){if(tlu[m][n]==tlu[l][n]){t++;}}
            mtc[m][l]=t;
            t=0;
            for(n=1;n<126;n++){if(tlu[m][n]+tlu[l][n]==4){t++;}}
            if(mtc[m][l]<t){mtc[m][l]=t;}
        }
    }
}
/**/

```

In every step we always watch each variable on the seven lines: row, column, pillar and 4 pan-triagonals and check whether each value on it is 'Used' or 'Un-used' there.

If it is 'Used', then we must have another value to be checked again. But, if it is all 'Un-used' in the seven lines, then we can take it for the variable now and go on to the next step, after we set the flags for the value as 'Used' in all the seven directions.

6. How many Latin Units we could have in all:

The compact list below shows the recent result of my research, though only a part. The total count of Latin Units is 480.

What a small count it is! But it means we have to check every combination of three Latin Units in over 110 million ways (=480 x 480 x 480)! Why so many!

** 'Latin Cubes' of Order 5 for Pan-triagonal Type: **
 ** by Kanji Setsuda on June 7, 2010 with Xcode3.1.2 **

| 1/ | | | | | 25/ | | | | | 49/ | | | | |
|-------------------------------|-------------------------------|-------------------------------|--|--|-----|--|--|--|--|-----|--|--|--|--|
| 0—1—2—3—4 | 0—2—1—3—4 | 0—3—1—2—4 | | | | | | | | | | | | |
| 1 2 3 4 0 | 2 1 3 4 0 | 3 1 2 4 0 | | | | | | | | | | | | |
| 1 2 2 3 3 4 4 0 0 1 | 2 1 1 3 3 4 4 0 0 2 | 3 1 1 2 2 4 4 0 0 3 | | | | | | | | | | | | |
| 2 3 3 4 4 0 0 1 1 2 | 1 3 3 4 4 0 0 2 2 1 | 1 2 2 4 4 0 0 3 3 1 | | | | | | | | | | | | |
| 2 3 4 3 4 0 4 0 1 0 1 2 1 2 3 | 1 3 4 3 4 0 4 0 2 0 2 1 2 1 3 | 1 2 4 2 4 0 4 0 3 0 3 1 3 1 2 | | | | | | | | | | | | |
| 3 4 4 0 0 1 1 2 2 3 | 3 4 4 0 0 2 2 1 1 3 | 2 4 4 0 0 3 3 1 1 2 | | | | | | | | | | | | |
| 3 4 0 4 0 1 0 1 2 1 2 3 2 3 4 | 3 4 0 4 0 2 0 2 1 2 1 3 1 3 4 | 2 4 0 4 0 3 0 3 1 3 1 2 1 2 4 | | | | | | | | | | | | |
| 4 0 0 1 1 2 2 3 3 4 | 4 0 0 2 2 1 1 3 3 4 | 4 0 0 3 3 1 1 2 2 4 | | | | | | | | | | | | |
| 4 0 1 0 1 2 1 2 3 2 3 4 3 4 0 | 4 0 2 0 2 1 2 1 3 1 3 4 3 4 0 | 4 0 3 0 3 1 3 1 2 1 2 4 2 4 0 | | | | | | | | | | | | |
| 0 1 1 2 2 3 3 4 4 0 | 0 2 2 1 1 3 3 4 4 0 | 0 3 3 1 1 2 2 4 4 0 | | | | | | | | | | | | |
| 1 2 2 3 3 4 4 0 0 1 | 2 1 1 3 3 4 4 0 0 2 | 3 1 1 2 2 4 4 0 0 3 | | | | | | | | | | | | |
| 2 3 3 4 4 0 0 1 | 1 3 3 4 4 0 0 2 | 1 2 2 4 4 0 0 3 | | | | | | | | | | | | |
| 3—4—0—1—2 | 3—4—0—2—1 | 2—4—0—3—1 | | | | | | | | | | | | |

73/
 0—3—2—1—4
 |4 0 3 2 |1
 3 1 2 4 1 0 4 3 0 2
 |0 2 3 1 2 4 1 0 |4 3
 2 4 3 1 0 2 4 3 1 0 2 4 3 1 0
 |3 1 | 2 4 1 0 4 3 |0 2|
 1 0 2 4 3 1 0 2 4 3 1 0 2 4 3
 |2 4 | 1 0 4 3 0 2 |3 1|
 4 3 1 0 2 4 3 1 0 2 4 3 1 0 2
 1 0 | 4 3 0 2 3 1 2 4 |
 2 4 1 0 4 3 0 2 3 1
 3 | 2 1 4 0 |
 0—3—2—1—4

97/
 1—0—2—3—4
 |0 2 3 4 |1
 0 2 2 3 3 4 4 1 1 0
 |2 3 3 4 4 1 1 0 |0 2
 2 3 4 3 4 1 4 1 0 1 0 2 0 2 3
 |3 4 | 4 1 1 0 0 2 |2 3|
 3 4 1 4 1 0 1 0 2 0 2 3 2 3 4
 |4 1 | 1 0 0 2 2 3 |3 4|
 4 1 0 1 0 2 0 2 3 2 3 4 3 4 1
 1 0 | 0 2 2 3 3 4 4 1 |
 0 2 2 3 3 4 4 1 1 0
 2 | 3 4 1 0 |
 3—4—1—0—2

121/
 1—2—0—3—4
 |2 0 3 4 |1
 2 0 0 3 3 4 4 1 1 2
 |0 3 3 4 4 1 1 2 |2 0
 0 3 4 3 4 1 4 1 2 1 2 0 2 0 3
 |3 4 | 4 1 1 2 2 0 |0 3|
 3 4 1 4 1 2 1 2 0 2 0 3 0 3 4
 |4 1 | 1 2 2 0 0 3 |3 4|
 4 1 2 1 2 0 2 0 3 0 3 4 3 4 1
 1 2 | 2 0 0 3 3 4 4 1 |
 2 0 0 3 3 4 4 1 1 2
 0 | 3 4 1 2 |
 3—4—1—2—0

145/
 1—3—0—2—4
 |3 0 2 4 |1
 3 0 0 2 2 4 4 1 1 3
 |0 2 2 4 4 1 1 3 |3 0
 0 2 4 2 4 1 4 1 3 1 3 0 3 0 2
 |2 4 | 4 1 1 3 3 0 |0 2|
 2 4 1 4 1 3 1 3 0 3 0 2 0 2 4
 |4 1 | 1 3 3 0 0 2 |2 4|
 4 1 3 1 3 0 3 0 2 0 2 4 2 4 1
 1 3 | 3 0 0 2 2 4 4 1 |
 3 0 0 2 2 4 4 1 1 3
 0 | 2 4 1 3 |
 2—4—1—3—0

169/
 1—3—2—0—4
 |4 1 3 2 |0
 3 0 2 4 0 1 4 3 1 2
 |1 2 3 0 2 4 0 1 |4 3
 2 4 3 0 1 2 4 3 0 1 2 4 3 0 1
 |3 0 | 2 4 0 1 4 3 |1 2|
 0 1 2 4 3 0 1 2 4 3 0 1 2 4 3
 |2 4 | 0 1 4 3 1 2 |3 0|
 4 3 0 1 2 4 3 0 1 2 4 3 0 1 2
 0 1 | 4 3 1 2 3 0 2 4 |
 2 4 0 1 4 3 1 2 3 0
 3 | 2 0 4 1 |
 1—3—2—0—4

193/
 2—0—1—3—4
 |0 1 3 4 |2
 0 1 1 3 3 4 4 2 2 0
 |1 3 3 4 4 2 2 0 |0 1
 1 3 4 3 4 2 4 2 0 2 0 1 0 1 3
 |3 4 | 4 2 2 0 0 1 |1 3|
 3 4 2 4 2 0 2 0 1 0 1 3 1 3 4
 |4 2 | 2 0 0 1 1 3 |3 4|
 4 2 0 2 0 1 0 1 3 1 3 4 3 4 2
 2 0 | 0 1 1 3 3 4 4 2 |
 0 1 1 3 3 4 4 2 2 0
 1 | 3 4 2 0 |
 3—4—2—0—1

217/
 2—1—0—3—4
 |1 0 3 4 |2
 1 0 0 3 3 4 4 2 2 1
 |0 3 3 4 4 2 2 1 |1 0
 0 3 4 3 4 2 4 2 1 2 1 0 1 0 3
 |3 4 | 4 2 2 1 1 0 |0 3|
 3 4 2 4 2 1 2 1 0 1 0 3 0 3 4
 |4 2 | 2 1 1 0 0 3 |3 4|
 4 2 1 2 1 0 1 0 3 0 3 4 3 4 2
 2 1 | 1 0 0 3 3 4 4 2 |
 1 0 0 3 3 4 4 2 2 1
 0 | 3 4 2 1 |
 3—4—2—1—0

241/
 2—3—0—1—4
 |3 0 1 4 |2
 3 0 0 1 1 4 4 2 2 3
 |0 1 1 4 4 2 2 3 |3 0
 0 1 4 1 4 2 4 2 3 2 3 0 3 0 1
 |1 4 | 4 2 2 3 3 0 |0 1|
 1 4 2 4 2 3 2 3 0 3 0 1 0 1 4
 |4 2 | 2 3 3 0 0 1 |1 4|
 4 2 3 2 3 0 3 0 1 0 1 4 1 4 2
 2 3 | 3 0 0 1 1 4 4 2 |
 3 0 0 1 1 4 4 2 2 3
 0 | 1 4 2 3 |
 1—4—2—3—0

265/
 2—3—1—0—4
 |4 2 3 1 |0
 3 0 1 4 0 2 4 3 2 1
 |2 1 3 0 1 4 0 2 |4 3
 1 4 3 0 2 1 4 3 0 2 1 4 3 0 2
 |3 0 | 1 4 0 2 4 3 |2 1|
 0 2 1 4 3 0 2 1 4 3 0 2 1 4 3
 |1 4 | 0 2 4 3 2 1 |3 0|
 4 3 0 2 1 4 3 0 2 1 4 3 0 2 1
 0 2 | 4 3 2 1 3 0 1 4 |
 1 4 0 2 4 3 2 1 3 0
 3 | 1 0 4 2 |
 2—3—1—0—4

289/
 3—0—1—2—4
 |0 1 2 4 |3
 0 1 1 2 2 4 4 3 3 0
 |1 2 2 4 4 3 3 0 |0 1
 1 2 4 2 4 3 4 3 0 3 0 1 0 1 2
 |2 4 | 4 3 3 0 0 1 |1 2|
 2 4 3 4 3 0 3 0 1 0 1 2 1 2 4
 |4 3 | 3 0 0 1 1 2 |2 4|
 4 3 0 3 0 1 0 1 2 1 2 4 2 4 3
 3 0 | 0 1 1 2 2 4 4 3 |
 0 1 1 2 2 4 4 3 3 0
 1 | 2 4 3 0 |
 2—4—3—0—1

313/
 3—1—0—2—4
 |1 0 2 4 |3
 1 0 0 2 2 4 4 3 3 1
 |0 2 2 4 4 3 3 1 |1 0
 0 2 4 2 4 3 4 3 1 3 1 0 1 0 2
 |2 4 | 4 3 3 1 1 0 |0 2|
 2 4 3 4 3 1 3 1 0 1 0 2 0 2 4
 |4 3 | 3 1 1 0 0 2 |2 4|
 4 3 1 3 1 0 1 0 2 0 2 4 2 4 3
 3 1 | 1 0 0 2 2 4 4 3 |
 1 0 0 2 2 4 4 3 3 1
 0 | 2 4 3 1 |
 2—4—3—1—0

337/
 3—2—0—1—4
 |2 0 1 4 |3
 2 0 0 1 1 4 4 3 3 2
 |0 1 1 4 4 3 3 2 |2 0
 0 1 4 1 4 3 4 3 2 3 2 0 2 0 1
 |1 4 | 4 3 3 2 2 0 |0 1|
 1 4 3 4 3 2 3 2 0 2 0 1 0 1 4
 |4 3 | 3 2 2 0 0 1 |1 4|
 4 3 2 3 2 0 2 0 1 0 1 4 1 4 3
 3 2 | 2 0 0 1 1 4 4 3 |
 2 0 0 1 1 4 4 3 3 2
 0 | 1 4 3 2 |
 1—4—3—2—0

361/
 3—2—1—0—4
 |4 3 2 1 |0
 2 0 1 4 0 3 4 2 3 1
 |3 1 2 0 1 4 0 3 |4 2
 1 4 2 0 3 1 4 2 0 3 1 4 2 0 3
 |2 0 | 1 4 0 3 4 2 |3 1|
 0 3 1 4 2 0 3 1 4 2 0 3 1 4 2
 |1 4 | 0 3 4 2 3 1 |2 0|
 4 2 0 3 1 4 2 0 3 1 4 2 0 3 1
 0 3 | 4 2 3 1 2 0 1 4 |
 1 4 0 3 4 2 3 1 2 0
 2 | 1 0 4 3 |
 3—2—1—0—4

385/
 4—0—1—2—3
 |0 1 2 3 |4
 0 1 1 2 2 3 3 4 4 0
 |1 2 2 3 3 4 4 0 |0 1
 1 2 3 2 3 4 3 4 0 4 0 1 0 1 2
 |2 3 | 3 4 4 0 0 1 |1 2|
 2 3 4 3 4 0 4 0 1 0 1 2 1 2 3
 |3 4 | 4 0 0 1 1 2 |2 3|
 3 4 0 4 0 1 0 1 2 1 2 3 2 3 4
 4 0 | 0 1 1 2 2 3 3 4 |
 0 1 1 2 2 3 3 4 4 0
 1 | 2 3 4 0 |
 2—3—4—0—1

409/
 4—1—0—2—3
 |1 0 2 3 |4
 1 0 0 2 2 3 3 4 4 1
 |0 2 2 3 3 4 4 1 |1 0
 0 2 3 2 3 4 3 4 1 4 1 0 1 0 2
 |2 3 | 3 4 4 1 1 0 |0 2|
 2 3 4 3 4 1 4 1 0 1 0 2 0 2 3
 |3 4 | 4 1 1 0 0 2 |2 3|
 3 4 1 4 1 0 1 0 2 0 2 3 2 3 4
 4 1 | 1 0 0 2 2 3 3 4 |
 1 0 0 2 2 3 3 4 4 1
 0 | 2 3 4 1 |
 2—3—4—1—0

match the two styles of diagram expression between Classical and Mathematical. The classical expression uses a series of natural numbers from 1 to 125, while the other mathematical one uses a series of integers from 0 to 124. And our Positional Number System of Base 5 also uses integers from 0 to 4.

We must also remember we should make up our object of a series of numbers from 1 to 125 using each one strictly once. In the expression of Positional (5-th Increment) Number System, we have to use all $\{000_{(N5i)}, 001_{(N5i)}, 002_{(N5i)}, 003_{(N5i)}, 004_{(N5i)}, 100_{(N5i)}, 101_{(N5i)}, \dots, 434_{(N5i)}, 440_{(N5i)}, 441_{(N5i)}, 442_{(N5i)}, 443_{(N5i)}, 444_{(N5i)}\}$ taking each number strictly once. I say, this is one of the most important rules we should always obey.

Neither duplication nor lack of any number must be found there.

Tests are needed for the second step. Examine every actual result one after another to find out whether it is right or wrong. Check if it surely obeys the first definition. And find if it has neither duplication nor lack of any number in it.

Every combination of Latin Units does not always make the correct solution, you should know. But it often makes a wrong solution.

When you combine any two units which have too little difference or too much difference between them, you will surely have a wrong solution. It has a lot of duplication or lack of same numbers in it.

Only selected combinations could compose correct solutions.

Examine this two times: both before the calculation and after that.

We have to make a reference table that has 'resemblance' data between any two units before all, measuring how many variables have the same values or the complimentary ones. You can come this table before you combine any two units, and refer to it about their compatibility. After the calculation, you also have to examine your composition to find if it really has duplication or lack of any number.

Since we must have the set of Standard Solutions of our object cubes, we have to eliminate all the reflected patterns or the rotated ones from the Primitive Solutions. Standard solutions are found among primitive in 1/48 necessarily in any case of magic cubes. What can we do before or after our calculations?

Then we have to prepare two sets of Inequality Conditions defining the relations among these critical variables:

$n1 < n5; n1 < n21; n1 < n25; n1 < n101; n1 < n105; n1 < n121; n1 < n125; n2 < n6; n6 < n26;$

8. How to dictate our program for our 'C.E.C.' of Order5

Let me list out the second part of my Program, only a part.

```
/**/
long int cnt;
short cnt0, cnt1, cnt2, cnt3;
short u1, u2, u3;
short nm[126], flg[126];
short bc[176][5];
short d[4][129];
short tluh[481];
short tlu[481][126];
char mtc[481][481];
/**/
/* Main Program */
int main(){
    short m,n;
    printf("\n** 'Latin Cubes' of Order 5 for the Pan-triagonal Type: **\n");
    printf("** by Kanji Setsuda on June 12, 2010 with Xcode 3.1.2 **\n");
    cnt=0; cnt0=0; cnt1=0; cnt3=0;
    for(n=0;n<126;n++){nm[n]=0;}
```



```

    nm[6],nm[3],nm[31],nm[28],nm[56],nm[53],nm[81],nm[78],nm[106],nm[103]);
printf("  |%3d%6d      %3d%6d      %3d%6d      %3d%6d      |%3d%6d\n",
    nm[7],nm[4],nm[32],nm[29],nm[57],nm[54],nm[82],nm[79],nm[107],nm[104]);
printf("%4d%6d%6d--%3d---%3d---%3d---%3d---%3d---%3d---%3d---%3d---%3d---%3d\n",
    nm[11],nm[8],nm[5],nm[36],nm[33],nm[30],nm[61],nm[58],nm[55],
    nm[86],nm[83],nm[80],nm[111],nm[108],nm[105]);
printf("  |%3d%6d |      %3d%6d      %3d%6d      %3d%6d      |%3d%6d | \n",
    nm[12],nm[9],nm[37],nm[34],nm[62],nm[59],nm[87],nm[84],nm[112],nm[109]);
printf("%4d%6d%6d%5d%6d%6d%5d%6d%6d%5d%6d%6d%5d%6d%6d\n",
    nm[16],nm[13],nm[10],nm[41],nm[38],nm[35],nm[66],nm[63],nm[60],
    nm[91],nm[88],nm[85],nm[116],nm[113],nm[110]);
printf("  |%3d%6d |      %3d%6d      %3d%6d      %3d%6d      |%3d%6d | \n",
    nm[17],nm[14],nm[42],nm[39],nm[67],nm[64],nm[92],nm[89],nm[117],nm[114]);
printf("%4d---%3d---%3d---%3d---%3d---%3d---%3d---%3d---%3d---%3d---%3d---%3d%6d%6d\n",
    nm[21],nm[18],nm[15],nm[46],nm[43],nm[40],nm[71],nm[68],nm[65],
    nm[96],nm[93],nm[90],nm[121],nm[118],nm[115]);
printf("%7d%6d |      %3d%6d      %3d%6d      %3d%6d      %3d%6d | \n",
    nm[22],nm[19],nm[47],nm[44],nm[72],nm[69],nm[97],nm[94],nm[122],nm[119]);
printf("%10d%6d      %3d%6d      %3d%6d      %3d%6d      %3d%6d\n",
    nm[23],nm[20],nm[48],nm[45],nm[73],nm[70],nm[98],nm[95],nm[123],nm[120]);
printf("%13d |%14d%17d%17d%17d | \n",
    nm[24],nm[49],nm[74],nm[99],nm[124]);
printf("%16d-----%3d-----%3d-----%3d-----%3d\n",
    nm[25],nm[50],nm[75],nm[100],nm[125]);
}
/**/
void prdlu(short x){
short i;
if(x>3){printf("%24d/H%29d/M%29d/L\n",d[0][0],d[1][0],d[2][0]); x=3;}
else if(x==3){printf("%25d/%30d/%30d\n",d[0][0],d[1][0],d[2][0]);}
else if(x==2){printf("%25d/%30d\n",d[0][0],d[1][0]);}
else{printf("%25d\n",d[0][0]);}
for(i=0;i<x;i++){
printf("%2d-----%d-----%d-----%d-----%d",d[i][1],d[i][26],d[i][51],d[i][76],d[i][101]);
if(i<2){printf(" ");}}
printf("\n");
for(i=0;i<x;i++){
printf(" |%d%6d%6d%6d |%d",d[i][2],d[i][27],d[i][52],d[i][77],d[i][102]);
if(i<2){printf(" ");}}
printf("\n");
for(i=0;i<x;i++){
printf("%2d%2d%4d%2d%4d%2d%4d%2d%4d%2d",
d[i][6],d[i][3],d[i][31],d[i][28],d[i][56],d[i][53],d[i][81],d[i][78],d[i][106],d[i][103]);
if(i<2){printf(" ");}}
printf("\n");
for(i=0;i<x;i++){
printf(" |%d%2d%4d%2d%4d%2d%4d%2d |%d%2d",
d[i][7],d[i][4],d[i][32],d[i][29],d[i][57],d[i][54],d[i][82],d[i][79],d[i][107],d[i][104]);
if(i<2){printf(" ");}}
printf("\n");
for(i=0;i<x;i++){
printf("%2d%2d%2d-%d-%d-%d-%d-%d-%d-%d-%d-%d-%d",
d[i][11],d[i][8],d[i][5],d[i][36],d[i][33],d[i][30],d[i][61],d[i][58],d[i][55],
d[i][86],d[i][83],d[i][80],d[i][111],d[i][108],d[i][105]);
if(i<2){printf(" ");}}
printf("\n");
for(i=0;i<x;i++){
printf(" |%d%2d|%3d%2d%4d%2d%4d%2d |%d%2d|",
d[i][12],d[i][9],d[i][37],d[i][34],d[i][62],d[i][59],d[i][87],d[i][84],d[i][112],d[i][109]);
if(i<2){printf(" ");}}
printf("\n");
for(i=0;i<x;i++){
printf("%2d%2d%2d%2d%2d%2d%2d%2d%2d%2d%2d%2d%2d%2d%2d%2d",
d[i][16],d[i][13],d[i][10],d[i][41],d[i][38],d[i][35],d[i][66],d[i][63],d[i][60],
d[i][91],d[i][88],d[i][85],d[i][116],d[i][113],d[i][110]);

```

```

    if(i<2){printf(" ");}}
printf("\n");
for(i=0;i<x;i++){
    printf(" 1%d%2d1%3d%2d%4d%2d%4d%2d 1%d%2d1",
        d[i][17],d[i][14],d[i][42],d[i][39],d[i][67],d[i][64],d[i][92],d[i][89],d[i][117],d[i][114]);
    if(i<2){printf(" ");}}
printf("\n");
for(i=0;i<x;i++){
    printf("%2d-%d-%d-%d-%d-%d-%d-%d-%d-%d-%d-%d%2d%2d",
        d[i][21],d[i][18],d[i][15],d[i][46],d[i][43],d[i][40],d[i][71],d[i][68],d[i][65],
        d[i][96],d[i][93],d[i][90],d[i][121],d[i][118],d[i][115]);
    if(i<2){printf(" ");}}
printf("\n");
for(i=0;i<x;i++){
    printf(" %d%2d1%3d%2d%4d%2d%4d%2d%4d%2d1",
        d[i][22],d[i][19],d[i][47],d[i][44],d[i][72],d[i][69],d[i][97],d[i][94],d[i][122],d[i][119]);
    if(i<2){printf(" ");}}
printf("\n");
for(i=0;i<x;i++){
    printf(" %2d%2d%4d%2d%4d%2d%4d%2d%4d%2d",
        d[i][23],d[i][20],d[i][48],d[i][45],d[i][73],d[i][70],d[i][98],d[i][95],d[i][123],d[i][120]);
    if(i<2){printf(" ");}}
printf("\n");
for(i=0;i<x;i++){
    printf("%5d1%5d%6d%6d%6d1",
        d[i][24],d[i][49],d[i][74],d[i][99],d[i][124]);
    if(i<2){printf(" ");}}
printf("\n");
for(i=0;i<x;i++){
    printf("%6d-----%d-----%d-----%d-----%d",
        d[i][25],d[i][50],d[i][75],d[i][100],d[i][125]);
    if(i<2){printf(" ");}}
printf("\n");
}
/**/

```

9. What I have got as for the result of my hardest computation:

Let me list out the recent result of my compositions, though only a part.
 I have not yet sorted to rearrange the listing order of solutions to any smarter style.

*** 'Complete Euler Cubes' of Order 5 for the Pan-triagonal Type ***
 ** Made by Kanji Setsuda on June 12, 2010 with MacOSX & Xcode 3.1.2 **

| 1/H | | | | | 2/M | | | | | 3/L | | | | |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0 | 1 | 2 | 3 | 4 | 0 | 4 | 3 | 2 | 1 | 0 | 1 | 2 | 3 | 4 |
| 1 | 2 | 3 | 4 | 0 | 1 | 0 | 4 | 3 | 2 | 1 | 2 | 3 | 4 | 0 |
| 1 2 | 2 3 | 3 4 | 4 0 | 0 1 | 1 2 | 0 1 | 4 0 | 3 4 | 2 3 | 4 2 | 0 3 | 1 4 | 2 0 | 3 1 |
| 2 3 | 3 4 | 4 0 | 0 1 | 1 2 | 2 3 | 1 2 | 0 1 | 4 0 | 3 4 | 0 3 | 1 4 | 2 0 | 3 1 | 4 2 |
| 2 3 4 | 3 4 0 | 4 0 1 | 0 1 2 | 1 2 3 | 2 3 4 | 1 2 3 | 0 1 2 | 4 0 1 | 3 4 0 | 3 1 4 | 4 2 0 | 0 3 1 | 1 4 2 | 2 0 3 |
| 3 4 | 4 0 | 0 1 | 1 2 | 2 3 | 3 4 | 2 3 | 1 2 | 0 1 | 4 0 | 4 2 | 0 3 | 1 4 | 2 0 | 3 1 |
| 3 4 0 | 4 0 1 | 0 1 2 | 1 2 3 | 2 3 4 | 3 4 0 | 2 3 4 | 1 2 3 | 0 1 2 | 4 0 1 | 2 0 3 | 3 1 4 | 4 2 0 | 0 3 1 | 1 4 2 |
| 4 0 | 0 1 | 1 2 | 2 3 | 3 4 | 4 0 | 3 4 | 2 3 | 1 2 | 0 1 | 3 1 | 4 2 | 0 3 | 1 4 | 2 0 |
| 4 0 1 | 0 1 2 | 1 2 3 | 2 3 4 | 3 4 0 | 4 0 1 | 3 4 0 | 2 3 4 | 1 2 3 | 0 1 2 | 1 4 2 | 2 0 3 | 3 1 4 | 4 2 0 | 0 3 1 |
| 0 1 | 1 2 | 2 3 | 3 4 | 4 0 | 0 1 | 4 0 | 3 4 | 2 3 | 1 2 | 2 0 | 3 1 | 4 2 | 0 3 | 1 4 |
| 1 2 | 2 3 | 3 4 | 4 0 | 0 1 | 1 2 | 0 1 | 4 0 | 3 4 | 2 3 | 3 1 | 4 2 | 0 3 | 1 4 | 2 0 |
| 2 | 3 | 4 | 0 | 1 | 2 | 1 | 0 | 4 | 3 | 4 | 0 | 1 | 2 | 3 |
| 3 | 4 | 0 | 1 | 2 | 3 | 2 | 1 | 0 | 4 | 0 | 1 | 2 | 3 | 4 |

| 1/H | 2/M | 3/L | 1# | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|----|----|----|----|----|----|----|----|
| 1 | 47 | 68 | 89 | 110 | | | | | | | | | | |
| 32 | 53 | 99 | 120 | 11 | | | | | | | | | | |
| 35 | 63 | 51 | 84 | 97 | 105 | 118 | 21 | 14 | 42 | | | | | |
| 61 | 94 | 82 | 115 | 103 | 6 | 24 | 27 | 45 | 73 | | | | | |
| 64 | 92 | 125 | 85 | 113 | 16 | 101 | 9 | 37 | 22 | 30 | 58 | 43 | 71 | 79 |
| 95 | 123 | | 111 | 19 | 7 | 40 | 28 | 56 | | 74 | 77 | | | |

93 121 4 114 17 50 10 38 66 26 59 87 72 80 108
 |124 2 | 20 48 36 69 57 90 | 78 106 |
 122— 5— 33— 18— 46— 54— 39— 67—100— 60— 88—116— 76 109 12
 3 31 | 49 52 70 98 86 119 107 15 |
 34 62 55 83 96 104 117 25 13 41
 65 | 81 102 23 44 |
 91—112— 8— 29— 75

0—1—2—3—4 1/H 0—4—3—2—1 2/M 0—4—3—2—1 4/L
 |1 2 3 4 |0 |1 0 4 3 |2 |1 0 4 3 |2
 1 2 2 3 3 4 4 0 0 1 |1 2 0 1 4 0 3 4 2 3 |4 2 3 1 2 0 1 4 0 3
 |2 3 3 4 4 0 0 1 |1 2 |2 3 1 2 0 1 4 0 |3 4 |0 3 4 2 3 1 2 0 |1 4
 2 3 4-3-4-0-4-0-1-0-1-2-1-2-3 |2 3 4-1-2-3-0-1-2-4-0-1-3-4-0 |3 1 4-2-0-3-1-4-2-0-3-1-4-2-0
 |3 4| 4 0 0 1 1 2 |2 3| |3 4| 2 3 1 2 0 1 |4 0| |4 2| 3 1 2 0 1 4 |0 3|
 3 4 0 4 0 1 0 1 2 1 2 3 2 3 4 |3 4 0 2 3 4 1 2 3 0 1 2 4 0 1 |2 0 3 1 4 2 0 3 1 4 2 0 3 1 4
 |4 0| 0 1 1 2 2 3 |3 4| |4 0| 3 4 2 3 1 2 |0 1| |3 1| 2 0 1 4 0 3 |4 2|
 4-0-1-0-1-2-1-2-3-2-3-4-3-4-0 |4-0-1-3-4-0-2-3-4-1-2-3-0-1-2 |1-4-2-0-3-1-4-2-0-3-1-4-2-0-3
 0 1| 1 2 2 3 3 4 4 0| 0 1| 4 0 3 4 2 3 1 2| 2 0| 1 4 0 3 4 2 3 1|
 1 2 2 3 3 4 4 0 0 1 |1 2 0 1 4 0 3 4 2 3 |3 1 2 0 1 4 0 3 4 2
 2| 3 4 0 1| 2| 1 0 4 3| 4| 3 2 1 0|
 3—4—0—1—2 3—2—1—0—4 0—4—3—2—1

1/H 2/M 4/L 2#
 1—50—69—88—107
 | 32 51 100 119 | 13
 35 63 54 82 98 101 117 25 11 44
 | 61 94 85 113 104 7 23 26 | 42 75
 64 92 125— 83—111— 19—102— 10— 38— 21— 29— 57— 45— 73— 76
 | 95 123 | 114 17 8 36 27 60 | 71 79 |
 93 121 4 112 20 48 6 39 67 30 58 86 74 77 110
 |124 2 | 18 46 37 70 56 89 | 80 108 |
 122— 5— 33— 16— 49— 52— 40— 68— 96— 59— 87—120— 78 106 14
 3 31 | 47 55 66 99 90 118 109 12 |
 34 62 53 81 97 105 116 24 15 43
 65 | 84 103 22 41 |
 91—115— 9— 28— 72

0—1—2—3—4 1/H 0—4—3—2—1 2/M 0—1—2—4—3 7/L
 |1 2 3 4 |0 |1 0 4 3 |2 |1 2 4 3 |0
 1 2 2 3 3 4 4 0 0 1 |1 2 0 1 4 0 3 4 2 3 |3 2 0 4 1 3 2 0 4 1
 |2 3 3 4 4 0 0 1 |1 2 |2 3 1 2 0 1 4 0 |3 4 |0 4 1 3 2 0 4 1 |3 2
 2 3 4-3-4-0-4-0-1-0-1-2-1-2-3 |2 3 4-1-2-3-0-1-2-4-0-1-3-4-0 |4 1 3-3-2-0-0-4-1-1-3-2-2-0-4
 |3 4| 4 0 0 1 1 2 |2 3| |3 4| 2 3 1 2 0 1 |4 0| |3 2| 0 4 1 3 2 0 |4 1|
 3 4 0 4 0 1 0 1 2 1 2 3 2 3 4 |3 4 0 2 3 4 1 2 3 0 1 2 4 0 1 |2 0 4 4 1 3 3 2 0 0 4 1 1 3 2
 |4 0| 0 1 1 2 2 3 |3 4| |4 0| 3 4 2 3 1 2 |0 1| |4 1| 3 2 0 4 1 3 |2 0|
 4-0-1-0-1-2-1-2-3-2-3-4-3-4-0 |4-0-1-3-4-0-2-3-4-1-2-3-0-1-2 |1-3-2-2-0-4-4-1-3-3-2-0-0-4-1
 0 1| 1 2 2 3 3 4 4 0| 0 1| 4 0 3 4 2 3 1 2| 2 0| 4 1 3 2 0 4 1 3|
 1 2 2 3 3 4 4 0 0 1 |1 2 0 1 4 0 3 4 2 3 |4 1 3 2 0 4 1 3 2 0
 2| 3 4 0 1| 2| 1 0 4 3| 3| 0 1 2 4|
 3—4—0—1—2 3—2—1—0—4 0—1—2—4—3

1/H 2/M 7/L 3#
 1—47—68—90—109
 | 32 53 100 119 | 11
 34 63 51 85 97 104 118 21 15 42
 | 61 95 82 114 103 6 25 27 | 44 73
 65 92 124— 84—113— 16—101— 10— 37— 22— 29— 58— 43— 71— 80
 | 94 123 | 111 20 7 39 28 56 | 75 77 |
 93 121 5 115 17 49 9 38 66 26 60 87 72 79 108
 |125 2 | 19 48 36 70 57 89 | 78 106 |
 122— 4— 33— 18— 46— 55— 40— 67— 99— 59— 88—116— 76 110 12
 3 31 | 50 52 69 98 86 120 107 14 |
 35 62 54 83 96 105 117 24 13 41
 64 | 81 102 23 45 |
 91—112— 8— 30— 74

| | | |
|-------------------------------|-------------------------------|-------------------------------|
| 1/H | 2/M | 8/L |
| 0—1—2—3—4 | 0—4—3—2—1 | 0—3—4—2—1 |
| 1 2 3 4 0 | 1 0 4 3 2 | 1 0 3 4 2 |
| 1 2 2 3 3 4 4 0 0 1 | 1 2 0 1 4 0 3 4 2 3 | 3 2 4 1 2 0 1 3 0 4 |
| 2 3 3 4 4 0 0 1 | 2 3 1 2 0 1 4 0 | 0 4 3 2 4 1 2 0 |
| 2 3 4 3 4 0 4 0 1 0 1 2 1 2 3 | 2 3 4 1 2 3 0 1 2 4 0 1 3 4 0 | 4 1 3 2 0 4 1 3 2 0 4 1 3 2 0 |
| 3 4 4 0 0 1 1 2 | 3 4 2 3 1 2 0 1 | 3 2 4 1 2 0 1 3 |
| 3 4 0 4 0 1 0 1 2 1 2 3 2 3 4 | 3 4 0 2 3 4 1 2 3 0 1 2 4 0 1 | 2 0 4 1 3 2 0 4 1 3 2 0 4 1 3 |
| 4 0 0 1 1 2 2 3 | 4 0 3 4 2 3 1 2 | 4 1 2 0 1 3 0 4 |
| 4 0 1 0 1 2 1 2 3 2 3 4 3 4 0 | 4 0 1 3 4 0 2 3 4 1 2 3 0 1 2 | 1 3 2 0 4 1 3 2 0 4 1 3 2 0 4 |
| 0 1 1 2 2 3 3 4 4 0 | 0 1 4 0 3 4 2 3 1 2 | 2 0 1 3 0 4 3 2 4 1 |
| 1 2 2 3 3 4 4 0 0 1 | 1 2 0 1 4 0 3 4 2 3 | 4 1 2 0 1 3 0 4 3 2 |
| 2 3 4 0 1 | 2 1 0 4 3 | 3 4 2 1 0 |
| 3—4—0—1—2 | 3—2—1—0—4 | 0—3—4—2—1 |

| | | | |
|--|------------------|-----------------|------------------------|
| 1/H | 2/M | 8/L | 4# |
| 1-----49-----70-----88-----107 | | | |
| 32 | 51 | 99 | 120 |
| 34 63 | 55 82 | 98 101 | 117 24 |
| 61 95 | 84 113 | 105 7 | 23 26 |
| 65 92 124 | 83 111 | 20 102 | 9 38 21 30 57 44 73 76 |
| 94 123 | 115 17 | 8 36 | 27 59 71 80 |
| 93 121 5 112 | 19 48 6 40 67 29 | 58 86 75 77 109 | |
| 125 2 | 18 46 | 37 69 | 56 90 79 108 |
| 122 4 33 16 50 52 39 68 96 60 87 119 78 106 15 | | | |
| 3 31 | 47 54 | 66 100 | 89 118 110 12 |
| 35 62 | 53 81 | 97 104 | 116 25 14 43 |
| 64 | 85 | 103 | 22 41 |
| 91-----114-----10-----28-----72 | | | |

.....

Let me list it out in another compact style now, since I have got too many solutions to present here. I like to skip listing each set of Latin Units with only one exception in the list. I will also skip listing many solutions themselves, because I just want to show you the general image of the structure of solution set, in spite of only an outline.

*** 'Complete Euler Cubes' of Order 5 for the Pan-triagonal Type: ***
 ** Made by Kanji Setsuda on June 12, 2010 with MacOSX & Xcode 3.1.2 **

| | | | | | | | |
|---|--------|--------|------------------------|--------------------------------|--|-------------------------------|--------|
| 1/H | 2/M | 3/L | 1# | 1/H | 4/M | 2/L | 121# |
| 1-----47-----68-----89-----110 | | | | 1-----50-----69-----88-----107 | | | |
| 32 | 53 | 99 | 120 | 11 | 32 | 51 | 100 |
| 35 63 | 51 84 | 97 105 | 118 21 | 14 42 | 47 63 | 66 82 | 90 101 |
| 61 94 | 82 115 | 103 6 | 24 27 | 45 73 | 53 94 | 97 113 | 116 7 |
| 64 92 125 | 85 113 | 16 101 | 9 37 22 30 58 43 71 79 | 68 84 125 | 87 103 | 19 106 22 38 5 41 57 49 65 76 | |
| 95 123 | 111 19 | 7 40 | 28 56 | 74 77 | 99 115 | 118 9 | 12 28 |
| 93 121 4 114 17 50 10 38 66 26 59 87 72 80 108 | | | | | 89 105 16 108 24 40 | 2 43 59 46 62 78 70 81 122 | |
| 124 2 | 20 48 | 36 69 | 57 90 | 78 106 | 120 6 | 14 30 | 33 74 |
| 122 5 33 18 46 54 39 67 100 60 88 116 76 109 12 | | | | | 110 21 37 4 45 56 48 64 80 67 83 124 86 102 18 | | |
| 3 31 | 49 52 | 70 98 | 86 119 | 107 15 | 11 27 | 35 71 | 54 95 |
| 34 62 | 55 83 | 96 104 | 117 25 | 13 41 | 42 58 | 61 77 | 85 121 |
| 65 | 81 | 102 | 23 | 44 | 73 | 92 | 111 |
| 91-----112-----8-----29-----75 | | | | | 79-----123-----17-----36-----60 | | |
| 1/H | 6/M | 3/L | 241# | 1/H | 8/M | 2/L | 361# |
| 1-----42-----73-----89-----110 | | | | 1-----45-----74-----88-----107 | | | |
| 32 | 53 | 94 | 125 | 11 | 32 | 51 | 95 |
| 35 63 | 51 84 | 92 105 | 123 16 | 14 47 | 42 63 | 71 82 | 90 101 |
| 61 99 | 82 115 | 103 6 | 19 27 | 50 68 | 53 99 | 92 113 | 121 7 |
| 64 97 120 | 85 113 | 21 101 | 9 37 17 30 58 48 66 79 | 73 84 120 | 87 103 | 24 106 17 38 5 46 57 44 65 76 | |
| 100 118 | 111 24 | 7 40 | 28 56 | 69 77 | 94 115 | 123 9 | 12 28 |
| 98 116 4 114 22 45 10 38 71 26 59 87 67 80 108 | | | | | 89 105 21 108 19 40 | 2 48 59 41 62 78 75 81 117 | |
| 119 2 | 25 43 | 36 74 | 57 90 | 78 106 | 125 6 | 14 30 | 33 69 |
| 117 5 33 23 41 54 39 72 95 60 88 121 76 109 12 | | | | | 110 16 37 4 50 56 43 64 80 72 83 119 86 102 23 | | |
| 3 31 | 44 52 | 75 93 | 86 124 | 107 15 | 11 27 | 35 66 | 54 100 |
| 34 62 | 55 83 | 91 104 | 122 20 | 13 46 | 47 58 | 61 77 | 85 116 |
| 65 | 81 | 102 | 18 | 49 | 68 | 97 | 111 |
| 96-----112-----8-----29-----70 | | | | | 79-----118-----22-----36-----60 | | |

1/H 10/M 3/L 481#
 1—47—63—94—110
 |32—53—99—115—|16
 35 68 51 84 97 105 113 21 19 37
 |66 89 82 120 103 6 24 27 |40 73
 69 87 125—85—118—11—101—9—42—22—30—58—38—71—79
 |90 123 | 116 14 7 45 28 56 |74 77 |
 88 121 4 119 12 50 10 43 61 26 59 92 72 80 108
 124 2 | 15 48 41 64 57 95 |78 106 |
 122—5—33—13—46—54—44—62—100—60—93—111—76 109 17
 3 31 | 49 52 65 98 91 114 107 20 |
 34 67 55 83 96 104 112 25 18 36
 70 | 81 102 23 39 |
 86—117—8—29—75

1/H 12/M 2/L 601#
 1—50—64—93—107
 |32—51—100—114—|18
 47 68 61 82 95 101 109 25 3 39
 |53 89 97 118 111 7 20 26 |34 75
 63 84 125—92—103—14—106—22—43—5—36—57—49—70—76
 |99 120 | 113 9 17 28 31 72 |55 86 |
 94 105 11 108 24 45 2 38 59 46 67 78 65 81 122
 115 6 | 19 30 33 74 52 88 |96 117 |
 110—21—42—4—40—56—48—69—80—62—83—124—91 102 13
 16 27 | 35 71 54 90 98 119 112 8 |
 37 58 66 77 85 121 104 15 23 44
 73 | 87 116 10 29 |
 79—123—12—41—60

1/H 14/M 3/L 721#
 1—37—73—94—110
 |32—53—89—125—|16
 35 68 51 84 87 105 123 11 19 47
 |66 99 82 120 103 6 14 27 |50 63
 69 97 115—85—118—21—101—9—42—12—30—58—48—61—79
 |100 113 | 116 24 7 45 28 56 |64 77 |
 98 111 4 119 22 40 10 43 71 26 59 92 62 80 108
 114 2 | 25 38 41 74 57 95 |78 106 |
 112—5—33—23—36—54—44—72—90—60—93—121—76 109 17
 3 31 | 39 52 75 88 91 124 107 20 |
 34 67 55 83 86 104 122 15 18 46
 70 | 81 102 13 49 |
 96—117—8—29—65

1/H 16/M 2/L 841#
 1—40—74—93—107
 |32—51—90—124—|18
 37 68 71 82 95 101 109 15 3 49
 |53 99 87 118 121 7 20 26 |34 65
 73 84 115—92—103—24—106—12—43—5—46—57—39—70—76
 |89 120 | 123 9 17 28 31 62 |55 96 |
 94 105 21 108 14 45 2 48 59 36 67 78 75 81 112
 125 6 | 19 30 33 64 52 98 |86 117 |
 110—11—42—4—50—56—38—69—80—72—83—114—91 102 23
 16 27 | 35 61 54 100 88 119 122 8 |
 47 58 66 77 85 111 104 25 13 44
 63 | 97 116 10 29 |
 79—113—22—41—60

1/H 18/M 3/L 961#
 1—42—63—99—110
 |32—53—94—115—|21
 35 73 51 84 92 105 113 16 24 37
 |71 89 82 125 103 6 19 27 |40 68
 74 87 120—85—123—11—101—9—47—17—30—58—38—66—79
 |90 118 | 121 14 7 50 28 56 |69 77 |
 88 116 4 124 12 45 10 48 61 26 59 97 67 80 108
 119 2 | 15 43 46 64 57 100 |78 106 |
 117—5—33—13—41—54—49—62—95—60—98—111—76 109 22
 3 31 | 44 52 65 93 96 114 107 25 |
 34 72 55 83 91 104 112 20 23 36
 75 | 81 102 18 39 |
 86—122—8—29—70

1/H 20/M 2/L 1081#
 1—45—64—98—107
 |32—51—95—114—|23
 42 73 61 82 100 101 109 20 3 39
 |53 89 92 123 111 7 25 26 |34 70
 63 84 120—97—103—14—106—17—48—5—36—57—44—75—76
 |94 125 | 113 9 22 28 31 67 |55 86 |
 99 105 11 108 19 50 2 38 59 41 72 78 65 81 117
 115 6 | 24 30 33 69 52 88 |91 122 |
 110—16—47—4—40—56—43—74—80—62—83—119—96 102 13
 21 27 | 35 66 54 90 93 124 112 8 |
 37 58 71 77 85 116 104 15 18 49
 68 | 87 121 10 29 |
 79—118—12—46—60

1/H 22/M 3/L 1201#
 1—37—68—99—110
 |32—53—89—120—|21
 35 73 51 84 87 105 118 11 24 42
 |71 94 82 125 103 6 14 27 |45 63
 74 92 115—85—123—16—101—9—47—12—30—58—43—61—79
 |95 113 | 121 19 7 50 28 56 |64 77 |
 93 111 4 124 17 40 10 48 66 26 59 97 62 80 108
 114 2 | 20 38 46 69 57 100 |78 106 |
 112—5—33—18—36—54—49—67—90—60—98—116—76 109 22
 3 31 | 39 52 70 88 96 119 107 25 |
 34 72 55 83 86 104 117 15 23 41
 75 | 81 102 13 44 |
 91—122—8—29—65

1/H 24/M 2/L 1321#
 1—40—69—98—107
 |32—51—90—119—|23
 37 73 66 82 100 101 109 15 3 44
 |53 94 87 123 116 7 25 26 |34 65
 68 84 115—97—103—19—106—12—48—5—41—57—39—75—76
 |89 125 | 118 9 22 28 31 62 |55 91 |
 99 105 16 108 14 50 2 43 59 36 72 78 70 81 112
 120 6 | 24 30 33 64 52 93 |86 122 |
 110—11—47—4—45—56—38—74—80—67—83—114—96 102 18
 21 27 | 35 61 54 95 88 124 117 8 |
 42 58 71 77 85 111 104 20 13 49
 63 | 92 121 10 29 |
 79—113—17—46—60

1/H 26/M 3/L 1441#
 1—47—68—84—115
 |37—53—99—120—|6
 40 58 51 89 97 105 118 21 9 42
 |56 94 87 110 103 11 24 27 |45 73
 59 92 125—90—108—16—101—14—32—22—30—63—43—71—79
 |95 123 | 106 19 12 35 28 61 |74 77 |
 93 121 4 109 17 50 15 33 66 26 64 82 72 80 113
 124 2 | 20 48 31 69 62 85 |78 111 |
 122—5—38—18—46—54—34—67—100—65—83—116—76 114 7
 3 36 | 49 52 70 98 81 119 112 10 |
 39 57 55 88 96 104 117 25 8 41
 60 | 86 102 23 44 |
 91—107—13—29—75

1/H 28/M 2/L 1561#
 1—50—69—83—112
 |37—51—100—119—|8
 47 58 66 87 85 101 114 25 3 44
 |53 94 97 108 116 12 10 26 |39 75
 68 89 125—82—103—19—111—22—33—5—41—62—49—60—76
 |99 110 | 118 14 7 28 36 72 |55 91 |
 84 105 16 113 24 35 2 43 64 46 57 78 70 86 122
 120 11 | 9 30 38 74 52 93 |96 107 |
 115—21—32—4—45—61—48—59—80—67—88—124—81 102 18
 6 27 | 40 71 54 95 98 109 117 13 |
 42 63 56 77 90 121 104 20 23 34
 73 | 92 106 15 29 |
 79—123—17—31—65

1/H 30/M 3/L 1681#
 1—42—73—84—115
 |37—53—94—125—6
 40 58 51 89 92 105 123 16 9 47
 |56 99 87 110 103 11 19 27 |50 68
 59 97 120—90—108—21—101—14—32—17—30—63—48—66—79
 |100 118 | 106 24 12 35 28 61 |69 77 |
 98 116 4 109 22 45 15 33 71 26 64 82 67 80 113
 119 2 | 25 43 31 74 62 85 |78 111 |
 117—5—38—23—41—54—34—72—95—65—83—121—76 114 7
 3 36 | 44 52 75 93 81 124 112 10 |
 39 57 55 88 91 104 122 20 8 46
 60 | 86 102 18 49 |
 96—107—13—29—70

1/H 32/M 2/L 1801#
 1—45—74—83—112
 |37—51—95—124—8
 42 58 71 87 85 101 114 20 3 49
 |53 99 92 108 121 12 10 26 |39 70
 73 89 120—82—103—24—111—17—33—5—46—62—44—60—76
 |94 110 | 123 14 7 28 36 67 |55 96 |
 84 105 21 113 19 35 2 48 64 41 57 78 75 86 117
 125 11 | 9 30 38 69 52 98 |91 107 |
 115—16—32—4—50—61—43—59—80—72—88—119—81 102 23
 6 27 | 40 66 54 100 93 109 122 13 |
 47 63 56 77 90 116 104 25 18 34
 68 | 97 106 15 29 |
 79—118—22—31—65

1/H 34/M 3/L 1921#
 1—47—58—94—115
 |37—53—99—110—16
 40 68 51 89 97 105 108 21 19 32
 |66 84 87 120 103 11 24 27 |35 73
 69 82 125—90—118—6—101—14—42—22—30—63—33—71—79
 |85 123 | 116 9 12 45 28 61 |74 77 |
 83 121 4 119 7 50 15 43 56 26 64 92 72 80 113
 124 2 | 10 48 41 59 62 95 |78 111 |
 122—5—38—8—46—54—44—57—100—65—93—106—76 114 17
 3 36 | 49 52 60 98 91 109 112 20 |
 39 67 55 88 96 104 107 25 18 31
 70 | 86 102 23 34 |
 81—117—13—29—75

1/H 36/M 2/L 2041#
 1—50—59—93—112
 |37—51—100—109—18
 47 68 56 87 95 101 114 25 3 34
 |53 84 97 118 106 12 20 26 |39 75
 58 89 125—92—103—9—111—22—43—5—31—62—49—70—76
 |99 120 | 108 14 17 28 36 72 |55 81 |
 94 105 6 113 24 45 2 33 64 46 67 78 60 86 122
 110 11 | 19 30 38 74 52 83 |96 117 |
 115—21—42—4—35—61—48—69—80—57—88—124—91 102 8
 16 27 | 40 71 54 85 98 119 107 13 |
 32 63 66 77 90 121 104 10 23 44
 73 | 82 116 15 29 |
 79—123—7—41—65

1/H 42/M 3/L 2161#
 1—42—58—99—115
 |37—53—94—110—21
 40 73 51 89 92 105 108 16 24 32
 |71 84 87 125 103 11 19 27 |35 68
 74 82 120—90—123—6—101—14—47—17—30—63—33—66—79
 |85 118 | 121 9 12 50 28 61 |69 77 |
 83 116 4 124 7 45 15 48 56 26 64 97 67 80 113
 119 2 | 10 43 46 59 62 100 |78 111 |
 117—5—38—8—41—54—49—57—95—65—98—106—76 114 22
 3 36 | 44 52 60 93 96 109 112 25 |
 39 72 55 88 91 104 107 20 23 31
 75 | 86 102 18 34 |
 81—122—13—29—70

1/H 44/M 2/L 2281#
 1—45—59—98—112
 |37—51—95—109—23
 42 73 56 87 100 101 114 20 3 34
 |53 84 92 123 106 12 25 26 |39 70
 58 89 120—97—103—9—111—17—48—5—31—62—44—75—76
 |94 125 | 108 14 22 28 36 67 |55 81 |
 99 105 6 113 19 50 2 33 64 41 72 78 60 86 117
 110 11 | 24 30 38 69 52 83 |91 122 |
 115—16—47—4—35—61—43—74—80—57—88—119—96 102 8
 21 27 | 40 66 54 85 93 124 107 13 |
 32 63 71 77 90 116 104 10 18 49
 68 | 82 121 15 29 |
 79—118—7—46—65

1/H 50/M 3/L 2401#
 1—47—63—84—120
 |42—53—99—115—6
 45 58 51 94 97 105 113 21 9 37
 |56 89 92 110 103 16 24 27 |40 73
 59 87 125—95—108—11—101—19—32—22—30—68—38—71—79
 |90 123 | 106 14 17 35 28 66 |74 77 |
 88 121 4 109 12 50 20 33 61 26 69 82 72 80 118
 124 2 | 15 48 31 64 67 85 |78 116 |
 122—5—43—13—46—54—34—62—100—70—83—111—76 119 7
 3 41 | 49 52 65 98 81 114 117 10 |
 44 57 55 93 96 104 112 25 8 36
 60 | 91 102 23 39 |
 86—107—18—29—75

1/H 52/M 2/L 2521#
 1—50—64—83—117
 |42—51—100—114—8
 47 58 61 92 85 101 119 25 3 39
 |53 89 97 108 111 17 10 26 |44 75
 63 94 125—82—103—14—116—22—33—5—36—67—49—60—76
 |99 110 | 113 19 7 28 41 72 |55 86 |
 84 105 11 118 24 35 2 38 69 46 57 78 65 91 122
 115 16 | 9 30 43 74 52 88 |96 107 |
 120—21—32—4—40—66—48—59—80—62—93—124—81 102 13
 6 27 | 45 71 54 90 98 109 112 18 |
 37 68 56 77 95 121 104 15 23 34
 73 | 87 106 20 29 |
 79—123—12—31—70

1/H 58/M 3/L 2641#
 1—47—58—89—120
 |42—53—99—110—11
 45 63 51 94 97 105 108 21 14 32
 |61 84 92 115 103 16 24 27 |35 73
 64 82 125—95—113—6—101—19—37—22—30—68—33—71—79
 |85 123 | 111 9 17 40 28 66 |74 77 |
 83 121 4 114 7 50 20 38 56 26 69 87 72 80 118
 124 2 | 10 48 36 59 67 90 |78 116 |
 122—5—43—8—46—54—39—57—100—70—88—106—76 119 12
 3 41 | 49 52 60 98 86 109 117 15 |
 44 62 55 93 96 104 107 25 13 31
 65 | 91 102 23 34 |
 81—112—18—29—75

1/H 60/M 2/L 2761#
 1—50—59—88—117
 |42—51—100—109—13
 47 63 56 92 90 101 119 25 3 34
 |53 84 97 113 106 17 15 26 |44 75
 58 94 125—87—103—9—116—22—38—5—31—67—49—65—76
 |99 115 | 108 19 12 28 41 72 |55 81 |
 89 105 6 118 24 40 2 33 69 46 62 78 60 91 122
 110 16 | 14 30 43 74 52 83 |96 112 |
 120—21—37—4—35—66—48—64—80—57—93—124—86 102 8
 11 27 | 45 71 54 85 98 114 107 18 |
 32 68 61 77 95 121 104 10 23 39
 73 | 82 111 20 29 |
 79—123—7—36—70

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|--|-------|---|-------|
| 1/H 98/M 3/L | 2881# | 1/H 100/M 2/L | 3001# |
| 6-----47-----68-----89-----105 | | 6-----50-----69-----88-----102 | |
| 27-----58-----99-----120----- 11 | | 27-----56-----100-----119----- 13 | |
| 30 63 56 79 97 110 118 21 14 42 | | 47 63 66 77 90 106 104 25 8 44 | |
| 61 94 77 115 108 1 24 32 45 73 | | 58 94 97 113 116 2 15 31 29 75 | |
| 64 92 125-80-113-16-106- 4-37-22-35-53-43-71-84 | | 68 79 125-87-108-19-101-22-38-10-41-52-49-65-81 | |
| 95 123 111 19 2 40 33 51 74 82 | | 99 115 118 4 12 33 26 72 60 91 | |
| 93 121 9 114 17 50 5 38 66 31 54 87 72 85 103 | | 89 110 16 103 24 40 7 43 54 46 62 83 70 76 122 | |
| 124 7 20 48 36 69 52 90 83 101 | | 120 1 14 35 28 74 57 93 96 112 | |
| 122-10-28-18-46-59-39-67-100-55-88-116-81-104-12 | | 105-21-37-9-45-51-48-64-85-67-78-124-86-107-18 | |
| 8 26 49 57 70 98 86 119 102 15 | | 11 32 30 71 59 95 98 114 117 3 | |
| 29 62 60 78 96 109 117 25 13 41 | | 42 53 61 82 80 121 109 20 23 39 | |
| 65 76 107 23 44 | | 73 92 111 5 34 | |
| 91-----112-----3-----34-----75 | | 84-----123-----17-----36-----55 | |

| | | |
|-------------------------------|-------------------------------|-------------------------------|
| 2/H | 1/M | 3/L |
| 0-----4-----3-----2-----1 | 0-----1-----2-----3-----4 | 0-----1-----2-----3-----4 |
| 1 0 4 3 2 | 1 2 3 4 0 | 1 2 3 4 0 |
| 1 2 0 1 4 0 3 4 2 3 | 1 2 2 3 3 4 4 0 0 1 | 4 2 0 3 1 4 2 0 3 1 |
| 2 3 1 2 0 1 4 0 3 4 | 2 3 3 4 4 0 0 1 1 2 | 0 3 1 4 2 0 3 1 4 2 |
| 2 3 4-1-2-3-0-1-2-4-0-1-3-4-0 | 2 3 4-3-4-0-4-0-1-0-1-2-1-2-3 | 3 1 4-4-2-0-0-3-1-1-4-2-2-0-3 |
| 3 4 2 3 1 2 0 1 4 0 | 3 4 4 0 0 1 1 2 2 3 | 4 2 0 3 1 4 2 0 3 1 |
| 3 4 0 2 3 4 1 2 3 0 1 2 4 0 1 | 3 4 0 4 0 1 0 1 2 1 2 3 2 3 4 | 2 0 3 3 1 4 4 2 0 0 3 1 1 4 2 |
| 4 0 3 4 2 3 1 2 0 1 | 4 0 0 1 1 2 2 3 3 4 | 3 1 4 2 0 3 1 4 2 0 |
| 4-0-1-3-4-0-2-3-4-1-2-3-0-1-2 | 4-0-1-0-1-2-1-2-3-2-3-4-3-4-0 | 1-4-2-2-0-3-3-1-4-4-2-0-0-3-1 |
| 0 1 4 0 3 4 2 3 1 2 | 0 1 1 2 2 3 3 4 4 0 | 2 0 3 1 4 2 0 3 1 4 |
| 1 2 0 1 4 0 3 4 2 3 | 1 2 2 3 3 4 4 0 0 1 | 3 1 4 2 0 3 1 4 2 0 |
| 2 1 0 4 3 | 2 3 4 0 1 | 4 0 1 2 3 |
| 3-----2-----1-----0-----4 | 3-----4-----0-----1-----2 | 0-----1-----2-----3-----4 |

| | |
|---|--------|
| 2/H 1/M 3/L | 14401# |
| 1-----107-----88-----69-----50 | |
| 32-----13-----119-----100----- 51 | |
| 35 63 11 44 117 25 98 101 54 82 | |
| 61 94 42 75 23 26 104 7 85 113 | |
| 64 92 125-45-73-76-21-29-57-102-10-38-83-111-19 | |
| 95 123 71 79 27 60 8 36 114 17 | |
| 93 121 4 74 77 110 30 58 86 6 39 67 112 20 48 | |
| 124 2 80 108 56 89 37 70 18 46 | |
| 122- 5-33-78-106-14-59-87-120-40-68-96-16-49-52 | |
| 3 31 109 12 90 118 66 99 47 55 | |
| 34 62 15 43 116 24 97 105 53 81 | |
| 65 41 22 103 84 | |
| 91-----72-----28-----9-----115 | |

| | | | |
|---|--------|--|--------|
| 4/H 1/M 2/L | 28801# | 5/H 2/M 3/L | 43201# |
| 1-----110-----89-----68-----47 | | 1-----47-----68-----114-----85 | |
| 32-----11-----120-----99----- 53 | | 32-----53-----124-----95----- 11 | |
| 107 63 86 42 70 21 49 105 3 84 | | 35 63 51 109 122 80 93 21 14 42 | |
| 13 94 117 73 96 27 55 6 34 115 | | 61 119 107 90 78 6 24 27 45 73 | |
| 88 44 125-67-23-79-46-102-58- 5-81-37-109-65-16 | | 64 117 100-110-88-16-76- 9-37-22-30-58-43-71-104 | |
| 119 75 98 29 52 8 31 112 15 91 | | 120 98 86 19 7 40 28 56 74 102 | |
| 69 25 76 48 104 60 2 83 39 106 62 18 90 41 122 | | 118 96 4 89 17 50 10 38 66 26 59 112 72 105 83 | |
| 100 26 54 10 33 114 12 93 116 72 | | 99 2 20 48 36 69 57 115 103 81 | |
| 50-101-57- 4-85-36-108-64-20-87-43-124-66-22-78 | | 97- 5-33-18-46-54-39-67-125-60-113-91-101-84-12 | |
| 51 7 35 111 14 95 118 74 97 28 | | 3 31 49 52 70 123 111 94 82 15 | |
| 82 38 61 17 45 121 24 80 103 59 | | 34 62 55 108 121 79 92 25 13 41 | |
| 113 92 71 30 9 | | 65 106 77 23 44 | |
| 19-----123-----77-----56-----40 | | 116-----87-----8-----29-----75 | |

| | | | |
|--|--------|--|--------|
| 6/H 1/M 3/L | 57601# | 8/H 1/M 2/L | 72001# |
| 1-----82-----113-----69-----50 | | 1-----85-----114-----68-----47 | |
| 32-----13-----94-----125----- 51 | | 32-----11-----95-----124----- 53 | |
| 35 63 11 44 92 25 123 76 54 107 | | 82 63 111 42 70 21 49 80 3 109 | |
| 61 119 42 75 23 26 79 7 110 88 | | 13 119 92 73 121 27 55 6 34 90 | |
| 64 117 100-45-73-101-21-29-57-77-10-38-108-86-19 | | 113 44 100-67-23-104-46-77-58- 5-106-37-84-65-16 | |
| 120 98 71 104 27 60 8 36 89 17 | | 94 75 123 29 52 8 31 87 15 116 | |
| 118 96 4 74 102 85 30 58 111 6 39 67 87 20 48 | | 69 25 101 48 79 60 2 108 39 81 62 18 115 41 97 | |
| 99 2 105 83 56 114 37 70 18 46 | | 125 26 54 10 33 89 12 118 91 72 | |
| 97- 5-33-103-81-14-59-112-95-40-68-121-16-49-52 | | 50-76-57- 4-110-36-83-64-20-112-43-99-66-22-103 | |
| 3 31 84 12 115 93 66 124 47 55 | | 51 7 35 86 14 120 93 74 122 28 | |
| 34 62 15 43 91 24 122 80 53 106 | | 107 38 61 17 45 96 24 105 78 59 | |
| 65 41 22 78 109 | | 88 117 71 30 9 | |
| 116-----72-----28-----9-----90 | | 19-----98-----102-----56-----40 | |

9/H 2/M 3/L 86401#
 1-----47-----93-----64-----110
 |32-----78-----74-----120-----111
 35 88 76 59 72 105 118 21 14 42
 |86 69 57 115 103 6 24 27 |45 98
 89 67 125-60-113-16-101- 9-37-22-30-83-43-96-54
 |70 123 | 111 19 7 40 28 81 |99 52 |
 68 121 4 114 17 50 10 38 91 26 84 62 97 55 108
 124 2 | 20 48 36 94 82 65 |53 106 |
 122- 5-33-18-46-79-39-92-75-85-63-116-51 109 12
 3 31 | 49 77 95 73 61 119 107 15 |
 34 87 80 58 71 104 117 25 13 41
 90 | 56 102 23 44 |
 66-----112-----8-----29-----100

10/H 1/M 3/L 100801#
 1-----107-----63-----94-----50
 |32-----13-----119-----75-----76
 35 88 11 44 117 25 73 101 79 57
 |86 69 42 100 23 26 104 7 |60 113
 89 67 125-45-98-51-21-29-82-102-10-38-58-111-19
 |70 123 | 96 54 27 85 8 36 |114 17 |
 68 121 4 99 52 110 30 83 61 6 39 92 112 20 48
 124 2 | 55 108 81 64 37 95 |18 46 |
 122- 5-33-53-106-14-84-62-120-40-93-71-16 49 77
 3 31 | 109 12 65 118 91 74 47 80 |
 34 87 15 43 116 24 72 105 78 56
 90 | 41 22 103 59 |
 66-----97-----28-----9-----115

12/H 1/M 2/L 115201#
 1-----110-----64-----93-----47
 |32-----11-----120-----74-----78
 107 88 61 42 95 21 49 105 3 59
 |13 69 117 98 71 27 80 6 |34 115
 63 44 125-92-23-54-46-102-83- 5-56-37-109-90-16
 119 100 | 73 29 77 8 31 112 |15 66 |
 94 25 51 48 104 85 2 58 39 106 87 18 65 41 122
 |75 26 | 79 10 33 114 12 68 116 97 |
 50-101-82- 4-60-36-108-89-20-62-43-124-91 22 53
 76 7 | 35 111 14 70 118 99 72 28 |
 57 38 86 17 45 121 24 55 103 84
 113 | 67 96 30 9 |
 19-----123-----52-----81-----40

13/H 2/M 3/L 129601#
 1-----47-----93-----114-----60
 |32-----78-----124-----70-----11
 35 88 76 109 122 55 68 21 14 42
 |86 119 107 65 53 6 24 27 |45 98
 89 117 75-110-63-16-51- 9-37-22-30-83-43-96-104
 |120 73 | 61 19 7 40 28 81 |99 102 |
 118 71 4 64 17 50 10 38 91 26 84 112 97 105 58
 |74 2 | 20 48 36 94 82 115 103 56 |
 72- 5-33-18-46-79-39-92-125-85-113-66-101 59 12
 3 31 | 49 77 95 123 111 69 57 15 |
 34 87 80 108 121 54 67 25 13 41
 90 | 106 52 23 44 |
 116-----62-----8-----29-----100

14/H 1/M 3/L 144001#
 1-----57-----113-----94-----50
 |32-----13-----69-----125-----76
 35 88 11 44 67 25 123 51 79 107
 |86 119 42 100 23 26 54 7 110 63
 89 117 75-45-98-101-21-29-82-52-10-38-108-61-19
 |120 73 | 96 104 27 85 8 36 |64 17 |
 118 71 4 99 102 60 30 83 111 6 39 92 62 20 48
 |74 2 | 105 58 81 114 37 95 |18 46 |
 72- 5-33-103-56-14-84-112-70-40-93-121-16 49 77
 3 31 | 59 12 115 68 91 124 47 80 |
 34 87 15 43 66 24 122 55 78 106
 90 | 41 22 53 109 |
 116-----97-----28-----9-----65

16/H 1/M 2/L 158401#
 1-----60-----114-----93-----47
 |32-----11-----70-----124-----78
 57 88 111 42 95 21 49 55 3 109
 |13 119 67 98 121 27 80 6 |34 65
 113 44 75-92-23-104-46-52-83- 5-106-37-59-90-16
 |69 100 | 123 29 77 8 31 62 |15 116 |
 94 25 101 48 54 85 2 108 39 56 87 18 115 41 72
 |125 26 | 79 10 33 64 12 118 66 97 |
 50-51-82- 4-110-36-58-89-20-112-43-74-91 22 103
 76 7 | 35 61 14 120 68 99 122 28 |
 107 38 86 17 45 71 24 105 53 84
 63 | 117 96 30 9 |
 19-----73-----102-----81-----40

17/H 2/M 3/L 172801#
 1-----47-----118-----64-----85
 |32-----103-----74-----95-----111
 35 113 101 59 72 80 93 21 14 42
 |111 69 57 90 78 6 24 27 |45 123
 114 67 100-60-88-16-76- 9-37-22-30-108-43-121-54
 |70 98 | 86 19 7 40 28 106 124 52 |
 68 96 4 89 17 50 10 38 116 26 109 62 122 55 83
 |99 2 | 20 48 36 119 107 65 |53 81 |
 97- 5-33-18-46-104-39-117-75-110-63-91-51 84 12
 3 31 | 49 102 120 73 61 94 82 15 |
 34 112 105 58 71 79 92 25 13 41
 115 | 56 77 23 44 |
 66-----87-----8-----29-----125

18/H 1/M 3/L 187201#
 1-----82-----63-----119-----50
 |32-----13-----94-----75-----101
 35 113 11 44 92 25 73 76 104 57
 |111 69 42 125 23 26 79 7 |60 88
 114 67 100-45-123-51-21-29-107-77-10-38-58-86-19
 |70 98 | 121 54 27 110 8 36 |89 17 |
 68 96 4 124 52 85 30 108 61 6 39 117 87 20 48
 |99 2 | 55 83 106 64 37 120 |18 46 |
 97- 5-33-53-81-14-109-62-95-40-118-71-16 49 102
 3 31 | 84 12 65 93 116 74 47 105 |
 34 112 15 43 91 24 72 80 103 56
 115 | 41 22 78 59 |
 66-----122-----28-----9-----90

20/H 1/M 2/L 201601#
 1-----85-----64-----118-----47
 |32-----11-----95-----74-----103
 82 113 61 42 120 21 49 80 3 59
 |13 69 92 123 71 27 105 6 |34 90
 63 44 100-117-23-54-46-77-108- 5-56-37-84-115-16
 |94 125 | 73 29 102 8 31 87 |15 66 |
 119 25 51 48 79 110 2 58 39 81 112 18 65 41 97
 |75 26 | 104 10 33 89 12 68 |91 122 |
 50-76-107- 4-60-36-83-114-20-62-43-99-116 22 53
 101 7 | 35 86 14 70 93 124 72 28 |
 57 38 111 17 45 96 24 55 78 109
 88 | 67 121 30 9 |
 19-----98-----52-----106-----40

21/H 2/M 3/L 216001#
 1-----47-----118-----89-----60
 |32-----103-----99-----70-----111
 35 113 101 84 97 55 68 21 14 42
 |111 94 82 65 53 6 24 27 |45 123
 114 92 75-85-63-16-51- 9-37-22-30-108-43-21-79
 |95 73 | 61 19 7 40 28 106 124 77 |
 93 71 4 64 17 50 10 38 116 26 109 87 122 80 58
 |74 2 | 20 48 36 119 107 90 |78 56 |
 72- 5-33-18-46-104-39-117-100-110-88-66-76 59 12
 3 31 | 49 102 120 98 86 69 57 15 |
 34 112 105 83 96 54 67 25 13 41
 115 | 81 52 23 44 |
 91-----62-----8-----29-----125

22/H 1/M 3/L 230401#
 1-----57-----88-----119-----50
 |32-----13-----69-----100-----101
 35 113 11 44 67 25 98 51 104 82
 111 94 42 125 23 26 54 7 |85 63
 114 92 75-45-123-76-21-29-107-52-10-38-83-61-19
 |95 73 | 121 79 27 110 8 36 |64 17 |
 93 71 4 124 77 60 30 108 86 6 39 117 62 20 48
 |74 2 | 80 58 106 89 37 120 |18 46 |
 72- 5-33-78-56-14-109-87-70-40-118-96-16 49 102
 3 31 | 59 12 90 68 116 99 47 105 |
 34 112 15 43 66 24 97 55 103 81
 115 | 41 22 53 84 |
 91-----122-----28-----9-----65

24/H 1/M 2/L 244801#
 1-----60-----89-----118-----47
 |32-----11-----70-----99-----103
 57 113 86 42 120 21 49 55 3 84
 |13 94 67 123 96 27 105 6 |34 65
 88 44 75-117-23-79-46-52-108- 5-81-37-59-115-16
 |69 125 | 98 29 102 8 31 62 |15 91 |
 119 25 76 48 54 110 2 83 39 56 112 18 90 41 72
 |100 26 | 104 10 33 64 12 93 |66 122 |
 50-51-107- 4-85-36-58-114-20-87-43-74-116 22 78
 101 7 | 35 61 14 95 68 124 97 28 |
 82 38 111 17 45 71 24 80 53 109
 63 | 92 121 30 9 |
 19-----73-----77-----106-----40

25/H 2/M 3/L 259201#
 1-----72-----43-----89-----110
 |57-----28-----99-----120-----11
 60 38 26 84 97 105 118 21 14 67
 |36 94 82 115 103 6 24 52 |70 48
 39 92 125-85-113-16-101- 9-62-22-55-33-68-46-79
 |95 123 | 111 19 7 65 53 31 |49 77 |
 93 121 4 114 17 75 10 63 41 51 34 87 47 80 108
 |124 2 | 20 73 61 44 32 90 |78 106 |
 122- 5-58-18-71-29-64-42-100-35-88-116-76 109 12
 3 56 | 74 27 45 98 86 119 107 15 |
 59 37 30 83 96 104 117 25 13 66
 40 | 81 102 23 69 |
 91-----112-----8-----54-----50

26/H 1/M 3/L 273601#
 1-----107-----88-----44-----75
 |57-----13-----119-----100-----26
 60 38 11 69 117 25 98 101 29 82
 |36 94 67 50 23 51 104 7 |85 113
 39 92 125-70-48-76-21-54-32-102-10-63-83-111-19
 |95 123 | 46 79 52 35 8 61 114 17 |
 93 121 4 49 77 110 55 33 86 6 64 42 112 20 73
 |124 2 | 80 108 31 89 62 45 |18 71 |
 122- 5-58-78-106-14-34-87-120-65-43-96-16 74 27
 3 56 | 109 12 90 118 41 99 72 30 |
 59 37 15 68 116 24 97 105 28 81
 40 | 66 22 103 84 |
 91-----47-----53-----9-----115

28/H 1/M 2/L 288001#
 1-----110-----89-----43-----72
 |57-----11-----120-----99-----28
 107 38 86 67 45 21 74 105 3 84
 |13 94 117 48 96 52 30 6 |59 115
 88 69 125-42-23-79-71-102-33- 5-81-62-109-40-16
 119 50 | 98 54 27 8 56 112 |15 91 |
 44 25 76 73 104 35 2 83 64 106 37 18 90 66 122
 100 51 | 29 10 58 114 12 93 116 47 |
 75-101-32- 4-85-61-108-39-20-87-68-124-41 22 78
 26 7 | 60 111 14 95 118 49 97 53 |
 82 63 36 17 70 121 24 80 103 34
 113 | 92 46 55 9 |
 19-----123-----77-----31-----65

29/H 2/M 3/L 302401#
 1-----72-----43-----114-----85
 |57-----28-----124-----95-----11
 60 38 26 109 122 80 93 21 14 67
 |36 119 107 90 78 6 24 52 |70 48
 39 117 100-110-88-16-76- 9-62-22-55-33-68-46-104
 |120 98 | 86 19 7 65 53 31 |49 102 |
 118 96 4 89 17 75 10 63 41 51 34 112 47 105 83
 |99 2 | 20 73 61 44 32 115 103 81 |
 97- 5-58-18-71-29-64-42-125-35-113-91-101 84 12
 3 56 | 74 27 45 123 111 94 82 15 |
 59 37 30 108 121 79 92 25 13 66
 40 | 106 77 23 69 |
 116-----87-----8-----54-----50

30/H 1/M 3/L 316801#
 1-----82-----113-----44-----75
 |57-----13-----94-----125-----26
 60 38 11 69 92 25 123 76 29 107
 |36 119 67 50 23 51 79 7 110 88
 39 117 100-70-48-101-21-54-32-77-10-63-108-86-19
 |120 98 | 46 104 52 35 8 61 |89 17 |
 118 96 4 49 102 85 55 33 111 6 64 42 87 20 73
 |99 2 | 105 83 31 114 62 45 |18 71 |
 97- 5-58-103-81-14-34-112-95-65-43-121-16 74 27
 3 56 | 84 12 115 93 41 124 72 30 |
 59 37 15 68 91 24 122 80 28 106
 40 | 66 22 78 109 |
 116-----47-----53-----9-----90

32/H 1/M 2/L 331201#
 1-----85-----114-----43-----72
 |57-----11-----95-----124-----28
 82 38 111 67 45 21 74 80 3 109
 |13 119 92 48 121 52 30 6 |59 90
 113 69 100-42-23-104-71-77-33- 5-106-62-84-40-16
 |94 50 | 123 54 27 8 56 87 |15 116 |
 44 25 101 73 79 35 2 108 64 81 37 18 115 66 97
 |125 51 | 29 10 58 89 12 118 |91 47 |
 75-76-32- 4-110-61-83-39-20-112-68-99-41 22 103
 26 7 | 60 86 14 120 93 49 122 53 |
 107 63 36 17 70 96 24 105 78 34
 88 | 117 46 55 9 |
 19-----98-----102-----31-----65

33/H 2/M 3/L 345601#
 1-----72-----93-----39-----110
 |57-----78-----49-----120-----11
 60 88 76 34 47 105 118 21 14 67
 |86 44 32 115 103 6 24 52 |70 98
 89 42 125-35-113-16-101- 9-62-22-55-83-68-96-29
 |45 123 | 111 19 7 65 53 81 |99 27 |
 43 121 4 114 17 75 10 63 91 51 84 37 97 30 108
 |124 2 | 20 73 61 94 82 40 |28 106 |
 122- 5-58-18-71-79-64-92-50-85-38-116-26 109 12
 3 56 | 74 77 95 48 36 119 107 15 |
 59 87 80 33 46 104 117 25 13 66
 90 | 31 102 23 69 |
 41-----112-----8-----54-----100

34/H 1/M 3/L 360001#
 1-----107-----38-----94-----75
 |57-----13-----119-----50-----76
 60 88 11 69 117 25 48 101 79 32
 |86 44 67 100 23 51 104 7 |35 113
 89 42 125-70-98-26-21-54-82-102-10-63-33-111-19
 |45 123 | 96 29 52 85 8 61 114 17 |
 43 121 4 99 27 110 55 83 36 6 64 92 112 20 73
 |124 2 | 30 108 81 39 62 95 |18 71 |
 122- 5-58-28-106-14-84-37-120-65-93-46-16 74 77
 3 56 | 109 12 40 118 91 49 72 80 |
 59 87 15 68 116 24 47 105 78 31
 90 | 66 22 103 34 |
 41-----97-----53-----9-----115

36/H 1/M 2/L 374401#
 1-----110-----39-----93-----72
 |57-----11-----120-----49-----78
 107 88 36 67 95 21 74 105 3 34
 |13 44 117 98 46 52 80 6 |59 115
 38 69 125-92-23-29-71-102-83- 5-31-62-109-90-16
 119 100 | 48 54 77 8 56 112 |15 41 |
 94 25 26 73 104 85 2 33 64 106 87 18 40 66 122
 |50 51 | 79 10 58 114 12 43 116 97 |
 75-101-82- 4-35-61-108-89-20-37-68-124-91 22 28
 76 7 | 60 111 14 45 118 99 47 53 |
 32 63 86 17 70 121 24 30 103 84
 113 | 42 96 55 9 |
 19-----123-----27-----81-----65

40/H 2/M 3/L 388801#
 1-----72-----93-----114-----35
 |57-----78-----124-----45-----11
 60 88 76 109 122 30 43 21 14 67
 |86 119 107 40 28 6 24 52 |70 98
 89 117 50-110-38-16-26- 9-62-22-55-83-68-96-104
 120 48 | 36 19 7 65 53 81 |99 102 |
 118 46 4 39 17 75 10 63 91 51 84 112 97 105 33
 |49 2 | 20 73 61 94 82 115 103 31 |
 47- 5-58-18-71-79-64-92-125-85-113-41-101-34 12
 3 56 | 74 77 95 123 111 44 32 15 |
 59 87 80 108 121 29 42 25 13 66
 90 | 106 27 23 69 |
 116-----37-----8-----54-----100

41/H 2/M 3/L 403201#
 1-----72-----118-----39-----85
 |57-----103-----49-----95-----11
 60 113 101 34 47 80 93 21 14 67
 111 44 32 90 78 6 24 52 |70 123
 114 42 100-35-88-16-76- 9-62-22-55-108-68-121-29
 |45 98 | 86 19 7 65 53 106 124 27 |
 43 96 4 89 17 75 10 63 116 51 109 37 122 30 83
 |99 2 | 20 73 61 119 107 40 |28 81 |
 97- 5-58-18-71-104-64-117-50-110-38-91-26 84 12
 3 56 | 74 102 120 48 36 94 82 15 |
 59 112 105 33 46 79 92 25 13 66
 115 | 31 77 23 69 |
 41-----87-----8-----54-----125

42/H 1/M 3/L 417601#
 1-----82-----38-----119-----75
 |57-----13-----94-----50-----101
 60 113 11 69 92 25 48 76 104 32
 111 44 67 125 23 51 79 7 |35 88
 114 42 100-70-123-26-21-54-107-77-10-63-33-86-19
 |45 98 | 121 29 52 110 8 61 |89 17 |
 43 96 4 124 27 85 55 108 36 6 64 117 87 20 73
 |99 2 | 30 83 106 39 62 120 |18 71 |
 97- 5-58-28-81-14-109-37-95-65-118-46-16 74 102
 3 56 | 84 12 40 93 116 49 72 105 |
 59 112 15 68 91 24 47 80 103 31
 115 | 66 22 78 34 |
 41-----122-----53-----9-----90

44/H 1/M 2/L 432001#
 1-----85-----39-----118-----72
 |57-----11-----95-----49-----103
 82 113 36 67 120 21 74 80 3 34
 |13 44 92 123 46 52 105 6 |59 90
 38 69 100-117-23-29-71-77-108- 5-31-62-84-115-16
 |94 125 | 48 54 102 8 56 87 |15 41 |
 119 25 26 73 79 110 2 33 64 81 112 18 40 66 97
 |50 51 | 104 10 58 89 12 43 |91 122 |
 75-76-107- 4-35-61-83-114-20-37-68-99-116 22 28
 101 7 | 60 86 14 45 93 124 47 53 |
 32 63 111 17 70 96 24 30 78 109
 88 | 42 121 55 9 |
 19-----98-----27-----106-----65

48/H 2/M 3/L 446401#
 1-----72-----118-----89-----35
 |57-----103-----99-----45-----11
 60 113 101 84 97 30 43 21 14 67
 111 94 82 40 28 6 24 52 |70 123
 114 92 50-85-38-16-26- 9-62-22-55-108-68-121-79
 |95 48 | 36 19 7 65 53 106 124 77 |
 93 46 4 39 17 75 10 63 116 51 109 87 122 80 33
 |49 2 | 20 73 61 119 107 90 |78 31 |
 47- 5-58-18-71-104-64-117-100-110-88-41-76 34 12
 3 56 | 74 102 120 98 86 44 32 15 |
 59 112 105 83 96 29 42 25 13 66
 115 | 81 27 23 69 |
 91-----37-----8-----54-----125

122/H 1/M 3/L 777601#
 26-----107-----88-----19-----75
 |57-----38-----119-----100-----1
 60 13 36 69 117 50 98 101 4 82
 |11 94 67 25 48 51 104 32 |85 113
 14 92 125-70-23-76-46-54- 7-102-35-63-83-111-44
 |95 123 | 21 79 52 10 33 61 114 42 |
 93 121 29 24 77 110 55 8 86 31 64 17 112 45 73
 124 27 | 80 108 6 89 62 20 |43 71 |
 122-30-58-78-106-39- 9-87-120-65-18-96-41 74 2
 28 56 | 109 37 90 118 16 99 72 5 |
 59 12 40 68 116 49 97 105 3 81
 15 | 66 47 103 84 |
 91-----22-----53-----34-----115

126/H 1/M 3/L 792001#
 26-----82-----113-----19-----75
 |57-----38-----94-----125-----1
 60 13 36 69 92 50 123 76 4 107
 |11 119 67 25 48 51 79 32 |110 88
 14 117 100-70-23-101-46-54- 7-77-35-63-108-86-44
 |120 98 | 21 104 52 10 33 61 |89 42 |
 118 96 29 24 102 85 55 8 111 31 64 17 87 45 73
 |99 27 | 105 83 6 114 62 20 |43 71 |
 97-30-58-103-81-39- 9-112-95-65-18-121-41 74 2
 28 56 | 84 37 115 93 16 124 72 5 |
 59 12 40 68 91 49 122 80 3 106
 15 | 66 47 78 109 |
 116-----22-----53-----34-----90

132/H 1/M 2/L 806401#
 26-----110-----14-----93-----72
 |57-----36-----120-----24-----78
 107 88 11 67 95 46 74 105 28 9
 |38 19 117 98 21 52 80 31 |59 115
 13 69 125-92-48- 4-71-102-83-30- 6-62-109-90-41
 119 100 | 23 54 77 33 56 112 |40 16 |
 94 50 1 73 104 85 27 8 64 106 87 43 15 66 122
 |25 51 | 79 35 58 114 37 18 116 97 |
 75-101-82-29-10-61-108-89-45-12-68-124-91 47 3
 76 32 | 60 111 39 20 118 99 22 53 |
 7 63 86 42 70 121 49 5 103 84
 113 | 17 96 55 34 |
 44-----123-----2-----81-----65

140/H 1/M 2/L 820801#
 26-----85-----14-----118-----72
 |57-----36-----95-----24-----103
 82 113 11 67 120 46 74 80 28 9
 |38 19 92 123 21 52 105 31 |59 90
 13 69 100-117-48- 4-71-77-108-30- 6-62-84-115-41
 |94 125 | 23 54 102 33 56 87 |40 16 |
 119 50 1 73 79 110 27 8 64 81 112 43 15 66 97
 |25 51 | 104 35 58 89 37 18 |91 122 |
 75-76-107-29-10-61-83-114-45-12-68-99-116 47 3
 101 32 | 60 86 39 20 93 124 22 53 |
 7 63 111 42 70 96 49 5 78 109
 88 | 17 121 55 34 |
 44-----98-----2-----106-----65

| 146/H | 1/M | 3/L | 835201# | | | | | | 156/H | 1/M | 2/L | 849601# | | | | | | | | | | | | | | | | | |
|-------|-----|-----|---------|-----|-----|-----|-----|-----|-------|-----|-----|---------|-----|-----|-----|-----|-----|-----|-----|----|-----|-----|----|-----|----|-----|----|----|-----|
| 26 | 107 | 63 | 19 | 100 | 26 | 110 | 14 | 68 | 97 | 82 | 36 | 120 | 24 | 53 | | | | | | | | | | | | | | | |
| 82 | 38 | 119 | 75 | 1 | 82 | 36 | 120 | 24 | 53 | 107 | 63 | 11 | 92 | 70 | 46 | 99 | 105 | 28 | 9 | | | | | | | | | | |
| 85 | 13 | 36 | 94 | 117 | 50 | 73 | 101 | 4 | 57 | 38 | 19 | 117 | 73 | 21 | 77 | 55 | 31 | 84 | 115 | | | | | | | | | | |
| 11 | 69 | 92 | 25 | 48 | 76 | 104 | 32 | 60 | 113 | 13 | 94 | 125 | 67 | 48 | 4 | 96 | 102 | 58 | 30 | 6 | 87 | 109 | 65 | 41 | | | | | |
| 14 | 67 | 125 | 95 | 23 | 51 | 46 | 79 | 7 | 102 | 35 | 88 | 58 | 111 | 44 | 119 | 75 | 23 | 79 | 52 | 33 | 81 | 112 | 40 | 16 | | | | | |
| 70 | 123 | 21 | 54 | 77 | 10 | 33 | 86 | 114 | 42 | 69 | 50 | 1 | 98 | 104 | 60 | 27 | 8 | 89 | 106 | 62 | 43 | 15 | 91 | 122 | | | | | |
| 68 | 121 | 29 | 24 | 52 | 110 | 80 | 8 | 61 | 31 | 89 | 17 | 112 | 45 | 98 | 69 | 50 | 1 | 98 | 104 | 60 | 27 | 8 | 89 | 106 | 62 | 43 | 15 | 91 | 122 |
| 124 | 27 | 55 | 108 | 6 | 64 | 87 | 20 | 43 | 96 | 25 | 76 | 54 | 35 | 83 | 114 | 37 | 18 | 116 | 72 | | | | | | | | | | |
| 122 | 30 | 83 | 53 | 106 | 39 | 9 | 62 | 120 | 90 | 18 | 71 | 41 | 99 | 2 | 100 | 101 | 57 | 29 | 10 | 86 | 108 | 64 | 45 | 12 | 93 | 124 | 66 | 47 | 3 |
| 28 | 81 | 109 | 37 | 65 | 118 | 16 | 74 | 97 | 5 | 51 | 32 | 85 | 111 | 39 | 20 | 118 | 74 | 22 | 78 | | | | | | | | | | |
| 84 | 12 | 40 | 93 | 116 | 49 | 72 | 105 | 3 | 56 | 7 | 88 | 61 | 42 | 95 | 121 | 49 | 5 | 103 | 59 | | | | | | | | | | |
| 15 | 91 | 47 | 103 | 59 | | | | | | 113 | 17 | 71 | 80 | 34 | | | | | | | | | | | | | | | |
| 66 | 22 | 78 | 34 | 115 | 44 | 123 | 2 | 56 | 90 | | | | | | | | | | | | | | | | | | | | |

** Counts according to the Values of n1: **

1:55296, 2:48384, 3:41472, 4:34560, 5:27648, 6:44928, 7:39744, 8:34560,
9:29376, 10:24192, 11:34560, 12:31104, 13:27648, 14:24192, 15:20736, 16:24192,
17:22464, 18:20736, 19:19008, 20:17280, 21:13824, 22:13824, 23:13824, 24:13824,
25:13824, 26:13824, 27:12096, 28:10368, 29:8640, 30:6912, 31:11232, 32:9936,
33:8640, 34:7344, 35:6048, 36:8640, 37:7776, 38:6912, 39:6048, 40:5184,
41:6048, 42:5616, 43:5184, 44:4752, 45:4320, 46:3456, 47:3456, 48:3456,
49:3456, 50:3456, 51:0, 52:0, 53:0, 54:0, 55:0, 56:0,
57:0, 58:0, 59:0, 60:0, 61:0, 62:0, 63:0, 64:0,
.

[Total Count of Standard Solutions = 864000] OK!

10. What I think about the result:

How happy I am that I have counted all the solutions and can report about them!

The list of solution counts above tells us all of them are the multiples of 27 (=3³):

3456=128x27; 4320=160x27; 4752=176x27; 5184=192x27; 5616=208x27; 6048=224x27; ...

The total count is finally divided as: 864000 = 32000 x 27 = 2⁸ x 3³ x 5³;

What does it mean by these factors? What structure do they imply about?

The total solution count also means: 480 x 480 x 480 x (3/8) x (1/48) = 864000.

480 is the count of Latin Units, 3/8 indicates the ratio of correct solutions to all the possible combinations and 1/48 means the ratio of standard solutions to primitive.

The next and last job of ours is to make 'Complete Euler Cubes' of Order 5 for the Simultaneous Type: Both Self-complementary and Pan-triagonal.

(English Version written by Kanji Setsuda on July 4, 2010 with MacOSX and Xcode3)

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