

Regular graphs in which every pair of points is missed by some longest cycle

BORIS SCHAUERTE AND CAROL T. ZAMFIRESCU

ABSTRACT. In Petersen's well-known cubic graph every vertex is missed by some longest cycle. Thomassen produced a planar graph with this property. Grünbaum found a cubic graph, in which any two vertices are missed by some longest cycle. In this paper we present a cubic planar graph fulfilling this condition.

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1. Introduction

The large group of automorphisms and the hypohamiltonicity of Petersen's graph are notorious. It is understandable that many other hypohamiltonian graphs have been discovered, and generalizations of hypohamiltonicity have been proposed. Such a generalization was given by T. Zamfirescu, who asked whether there exist graphs G such that for any k vertices of G there is a longest cycle of G avoiding those vertices. He called this property Ck [7] and asked for j -connected graphs with the property Ck and as small as possible [4].

Among planar 2-connected graphs the best known example for $k = 2$ was presented in [5] and has 138 vertices. Among 3-connected graphs the smallest example verifying $C2$ published so far has 75 vertices [6], while among planar 3-connected graphs the first example appeared in [6] and had 14818 vertices, and a smaller one appears in [3] and has 4277 vertices. Neither one is regular.

For $k = 1$, Petersen's graph is cubic, but non-planar. In 1978 C. Thomassen found an infinite family of cubic planar hypohamiltonian graphs [2].

It is our main goal here to provide planar graphs which enjoy property $C2$ and are also regular.

2. Two-Connected Graphs

We start with the following result concerning cubic planar graphs with property $C1$.

Theorem 1. *There exists a cubic 2-connected planar graph on 30 vertices such that any vertex is missed by some longest cycle.*

Proof. The graph of Fig. 1, being a straightforward modification of an example due to Thomassen and published in [6], enjoys the required properties.

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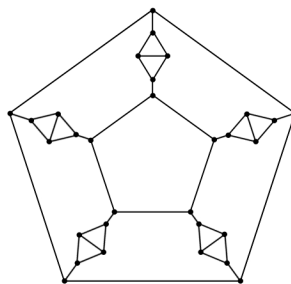


Fig. 1

Theorem 2. *There exists a cubic 2-connected planar graph on 280 vertices such that any pair of vertices is missed by some longest cycle.*

Proof. We construct the graph G in the following way. First, consider the graph G_1 of Fig. 2:

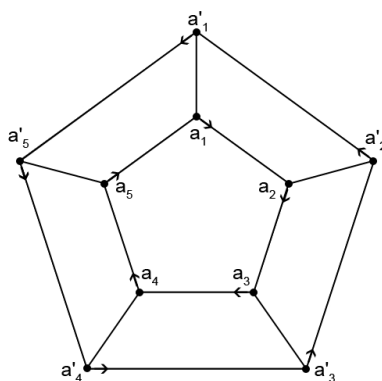


Fig. 2

Each of its vertices will be replaced by a graph G_2 , see Fig. 3, respecting the location of the arrow-marked edges.

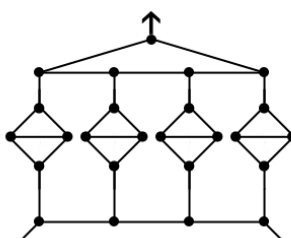


Fig. 3

We obtain a graph G_3 . The intersection of any longest cycle of G_3 with a G_2 -copy is a path with 20 vertices if the arrow-marked edge of that copy is used, or with 24 vertices if the other two end-edges of the G_2 -copy are used.

Suppose we intercalate between a_i and a_{i+1} (indices mod 5) and between a'_i and a'_{i+1} (indices mod 5) isomorphic copies of a graph with m vertices, and between a_i and a'_i isomorphic copies of a graph with n vertices, thus obtaining G .

Then each cycle of the type $a_1a_2a'_2a'_3a_3a_4a_5a'_5a'_4a'_3a'_2a'_1a_1$ in G_1 induces in G a cycle of length $5 \cdot 20 + 4 \cdot 24 + 5m + 4n$. Each cycle of type $a_1a_2a_3a_4a_5a'_5a'_4a'_3a'_2a'_1a_1$ in G_1 induces in G a cycle of length $8 \cdot 20 + 2 \cdot 24 + 8m + 2n$.

Both types of cycles of G must be longest cycles. So we must have $5 \cdot 20 + 4 \cdot 24 + 5m + 4n = 8 \cdot 20 + 2 \cdot 24 + 8m + 2n$, which yields $2n = 12 + 3m$.

To choose a small example, we consider the situation $m = 0$ and $n = 6$, so we intercalate nothing between a_i and a_{i+1} and between a'_i and a'_{i+1} , while between a_i and a'_i ($1 \leq i \leq 5$) we intercalate the graph of Fig. 4:

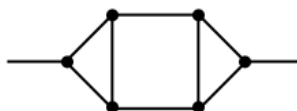


Fig. 4

The resulting 2-connected graph has 280 vertices, verifies $C2$, and is cubic.

3. Three-Connected Graphs

The first example of a 3-connected graph such that any pair of vertices is missed by some longest cycle was given by Grünbaum [1] in 1974. It has 90 vertices and is cubic.

Theorem 3. *There exists a cubic 3-connected planar graph on 8742 vertices such that any pair of vertices is missed by some longest cycle.*

Proof. We take Thomassen's graph T from [2] (94 vertices, Fig. 5), open it up at some vertex, and introduce it at every vertex of T .

We have to prove that every pair of edges in T is avoided by some longest cycle of T [6]. This turned out to be a tedious task - therefore we worked using a computer.

At the end of the paper we provide a table which associates to every pair of edges a cycle omitting it. It uses the following notation for edges (defined as pairs of numbers corresponding to the vertices of T , see Fig. 5):

0 : (1, 0), 1 : (2, 0), 2 : (0, 92), 3 : (2, 3), 4 : (3, 4), 5 : (4, 5), 6 : (5, 6), 7 : (1, 6), 8 : (2, 7), 9 : (7, 8), 10 : (8, 9),
 11 : (3, 9), 12 : (9, 10), 13 : (10, 11), 14 : (4, 11), 15 : (11, 12), 16 : (12, 13), 17 : (5, 13), 18 : (13, 14), 19 : (14, 15),
 20 : (6, 15), 21 : (8, 16), 22 : (16, 17), 23 : (10, 17), 24 : (12, 18), 25 : (18, 19), 26 : (14, 19), 27 : (16, 23), 28 : (23, 24),
 29 : (20, 24), 30 : (17, 20), 31 : (20, 21), 32 : (21, 22), 33 : (18, 22), 34 : (22, 25), 35 : (25, 26), 36 : (19, 26),
 37 : (24, 27), 38 : (27, 28), 39 : (21, 28), 40 : (28, 29), 41 : (25, 29), 42 : (27, 31), 43 : (30, 31), 44 : (23, 30),
 45 : (29, 32), 46 : (32, 33), 47 : (26, 33), 48 : (31, 34), 49 : (34, 35), 50 : (35, 36), 51 : (32, 36), 52 : (34, 39),
 53 : (39, 40), 54 : (37, 40), 55 : (35, 37), 56 : (37, 41), 57 : (41, 42), 58 : (36, 42), 59 : (42, 43), 60 : (33, 43),
 61 : (30, 38), 62 : (38, 39), 63 : (38, 45), 64 : (44, 45), 65 : (7, 44), 66 : (40, 46), 67 : (46, 47), 68 : (41, 47),
 69 : (43, 48), 70 : (48, 49), 71 : (15, 49), 72 : (45, 50), 73 : (50, 51), 74 : (51, 52), 75 : (46, 52), 76 : (47, 53),
 77 : (53, 54), 78 : (54, 55), 79 : (48, 55), 80 : (52, 56), 81 : (53, 56), 82 : (51, 57), 83 : (57, 58), 84 : (56, 58),
 85 : (58, 59), 86 : (54, 59), 87 : (55, 63), 88 : (50, 60), 89 : (60, 61), 90 : (57, 61), 91 : (59, 62), 92 : (62, 63),
 93 : (61, 64), 94 : (64, 65), 95 : (65, 66), 96 : (62, 66), 97 : (64, 68), 98 : (67, 68), 99 : (60, 67), 100 : (68, 71),
 101 : (71, 72), 102 : (65, 72), 103 : (72, 73), 104 : (69, 73), 105 : (66, 69), 106 : (69, 70), 107 : (63, 70), 108 : (67, 74),
 109 : (74, 75), 110 : (71, 75), 111 : (73, 76), 112 : (76, 77), 113 : (70, 77), 114 : (74, 79), 115 : (79, 80), 116 : (80, 81),
 117 : (75, 81), 118 : (81, 82), 119 : (82, 83), 120 : (76, 83), 121 : (83, 84), 122 : (84, 85), 123 : (77, 85), 124 : (85, 86),
 125 : (49, 86), 126 : (44, 78), 127 : (78, 79), 128 : (78, 87), 129 : (87, 88), 130 : (80, 88), 131 : (88, 89), 132 : (82, 89),
 133 : (89, 90), 134 : (84, 90), 135 : (90, 91), 136 : (86, 91), 137 : (87, 92), 138 : (91, 93), 139 : (92, 93), 140 : (1, 93).

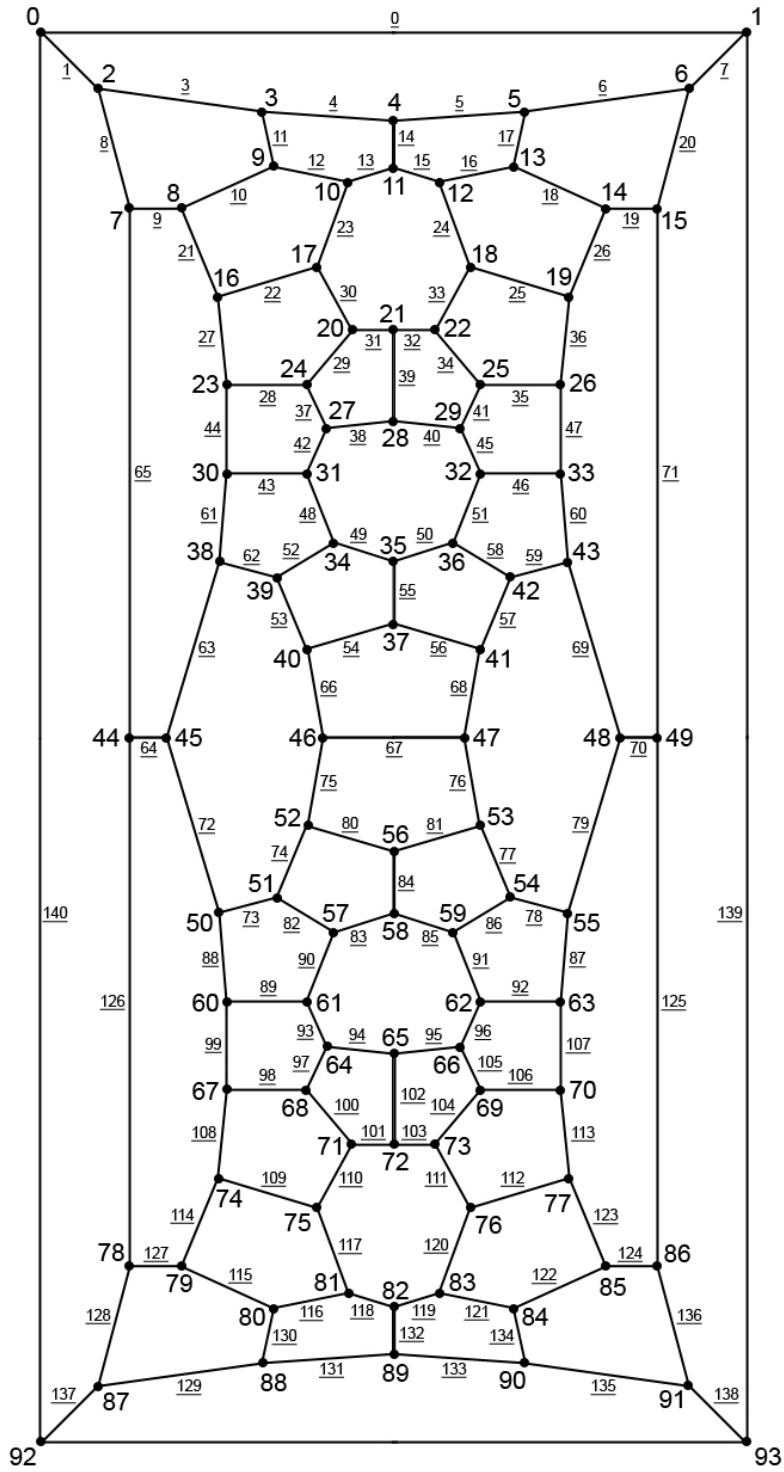


Fig. 5

Now we associate to the numbers in the table the corresponding cycles:

- 1: 92,87,88,80,81,82,89,90,84,83,76,77,70,63,55,48,49,86,91,93,1,6,15,14,19,18,22,25,26,33,43,42,41,47,53,54,59,62,66,69,73,72,65,64,61,60,67,68,71,75,74,79,78,44,45,50,51,57,58,56,52,46,40,37,35,36,32,29,28,21,20,24,27,31,34,39,38,30,23,16,17,10,11,12,13,5,4,3,9,8,7,2,0
- 2: 92,87,78,79,74,67,60,50,51,52,56,53,47,46,40,39,38,45,44,7,2,3,4,5,6,15,14,13,12,11,10,9,8,16,17,20,21,22,18,19,26,25,29,28,27,24,23,30,31,34,35,37,41,42,36,32,33,43,48,49,86,85,84,83,76,77,70,69,73,72,65,66,62,63,55,54,59,58,57,61,64,68,71,75,81,80,88,89,90,91,93,1,0
- 3: 0,1,93,91,90,84,83,76,73,69,70,77,85,86,49,48,43,33,32,36,42,41,37,35,34,39,40,46,47,53,56,52,51,57,58,59,54,55,63,62,66,65,72,71,75,74,67,68,64,61,60,50,45,38,30,31,27,28,29,25,26,19,18,22,21,20,24,23,16,17,10,11,12,13,14,15,6,5,4,3,9,8,7,44,78,79,80,81,82,89,88,87,92
- 4: 0,2,7,44,45,38,39,34,31,30,23,24,27,28,29,32,36,35,37,40,46,52,56,53,47,41,42,43,33,26,25,22,21,20,17,16,8,9,10,11,4,5,13,12,18,19,14,15,6,1,93,91,90,84,85,86,49,48,55,54,59,58,57,51,50,60,61,64,65,72,73,69,66,62,63,70,77,76,83,82,89,88,80,81,75,71,68,67,74,79,78,87,92
- 5: 0,2,3,9,8,16,23,30,38,39,40,37,41,47,46,52,51,50,45,44,78,87,88,89,90,91,86,85,84,83,82,81,80,79,74,75,71,72,73,76,77,70,69,66,65,64,68,67,60,61,57,58,56,53,54,59,62,63,55,48,49,15,14,13,12,18,19,26,25,22,21,28,29,32,33,43,42,36,35,34,31,27,24,20,17,10,11,4,5,6,1,93,92
- 6: 0,2,7,44,78,79,74,67,60,61,57,58,59,62,66,69,70,63,55,54,53,56,52,51,50,45,38,30,23,24,20,17,16,8,9,10,11,4,5,6,15,14,13,12,18,19,26,33,32,29,25,22,21,28,27,31,34,39,40,46,47,41,37,35,36,42,43,48,49,86,91,90,89,82,83,84,85,77,76,73,72,65,64,68,71,75,81,80,88,87,92,93,1
- 7: 92,0,2,7,8,16,17,20,24,23,30,38,39,40,46,52,56,58,59,62,63,70,69,66,65,64,68,67,60,61,57,51,50,45,44,78,87,88,80,79,74,75,71,72,73,76,77,85,84,83,82,89,90,91,86,49,48,55,54,53,47,41,37,35,34,31,27,28,21,22,25,29,32,36,42,43,33,26,19,18,12,11,10,9,3,4,5,13,14,15,6,1,93
- 8: 0,1,93,91,90,84,83,76,73,69,70,77,85,86,49,48,43,33,32,36,42,41,37,35,34,39,40,46,47,53,56,52,51,57,58,59,54,55,63,62,66,65,72,71,75,74,67,68,64,61,60,50,45,38,30,31,27,28,29,25,26,19,14,15,6,5,13,12,18,22,21,20,24,23,16,8,9,10,11,4,3,2,7,44,78,79,80,81,82,89,88,87,92
- 9: 0,2,3,9,10,11,12,13,5,6,1,93,91,90,84,85,86,49,15,14,19,18,22,21,20,17,16,8,7,44,45,38,39,34,31,30,23,24,27,28,29,25,26,33,32,36,35,37,40,46,52,56,53,47,41,42,43,48,55,54,59,58,57,51,50,60,61,64,65,72,73,69,66,62,63,70,77,76,83,82,89,88,80,81,75,71,68,67,74,79,78,87,92
- 10: 0,2,3,9,10,11,4,5,13,12,18,19,26,33,43,48,49,15,6,1,93,91,86,85,77,76,73,69,70,63,55,54,53,47,41,42,36,32,29,25,22,21,28,27,31,30,23,24,20,17,16,8,7,44,45,38,39,34,35,37,40,46,52,56,58,59,62,66,65,72,71,68,64,61,57,51,50,60,67,74,75,81,82,83,84,90,89,88,80,79,78,87,92
- 11: 0,1,93,92,87,88,89,82,83,76,77,85,84,90,91,86,49,48,55,54,59,58,57,51,50,60,61,64,65,66,62,63,70,69,73,72,71,68,67,74,75,81,80,79,78,44,7,8,16,17,20,24,23,30,38,39,34,31,27,28,21,22,25,29,32,36,35,37,40,46,52,56,53,47,41,42,43,33,26,19,18,12,13,14,15,6,5,4,11,10,9,3,2
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- 13: 0,2,3,4,5,13,14,19,18,12,11,10,17,20,24,27,31,30,23,16,8,7,44,45,38,39,34,35,37,40,46,52,56,58,59,62,66,65,72,71,68,64,61,57,51,50,60,67,74,75,81,82,83,84,90,89,88,80,79,78,87,92,93,91,86,85,77,76,73,69,70,63,55,54,53,47,41,42,36,32,29,28,21,22,25,26,33,43,48,49,15,6,1
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- 18: 92,87,88,80,81,82,83,84,90,91,93,1,6,5,13,14,15,49,86,85,77,76,73,72,71,75,74,79,78,44,45,50,51,57,61,60,67,68,64,65,66,69,70,63,62,59,58,56,52,46,40,37,41,47,53,54,55,48,43,42,36,35,34,39,38,30,31,27,28,21,22,25,29,32,33,26,19,18,12,11,4,3,9,10,17,20,24,23,16,8,7,2,0
- 19: 92,93,91,86,49,15,14,19,26,33,32,36,35,34,31,27,24,23,30,38,39,40,37,41,42,43,48,55,63,70,69,73,76,77,85,84,83,82,89,88,87,78,79,80,81,75,74,67,60,61,64,68,71,72,65,66,62,59,54,53,47,46,52,56,58,57,51,50,45,44,7,2,3,4,11,10,9,8,16,17,20,21,28,29,25,22,18,12,13,5,6,1,0
- 20: 0,1,93,91,90,89,82,83,84,85,86,49,15,14,13,5,4,3,2,7,8,9,10,11,12,18,19,26,25,22,21,20,17,16,23,24,27,28,29,32,33,43,48,55,63,62,66,69,70,77,76,73,72,65,64,61,60,50,51,57,58,59,54,53,56,52,46,47,41,42,36,35,37,40,39,34,31,30,38,45,44,78,79,74,67,68,71,75,81,80,88,87,92
- 21: 0,2,7,8,16,17,10,9,3,4,11,12,13,14,19,18,22,21,20,24,23,30,38,39,40,46,52,56,53,47,41,37,35,34,31,27,28,29,25,26,33,32,36,42,43,48,49,15,6,1,93,91,86,85,77,70,69,73,76,83,84,90,89,82,81,75,74,67,60,61,64,68,71,72,65,66,62,63,55,54,59,58,57,51,50,45,44,78,79,80,88,87,92
- 22: 0,2,7,44,78,87,88,89,90,84,85,77,76,83,82,81,80,79,74,75,71,72,73,69,70,63,55,54,59,62,66,65,64,68,67,60,61,57,58,56,53,47,46,52,51,50,45,38,39,40,37,41,42,36,35,34,31,30,23,16,8,9,3,4,11,10,17,20,24,27,28,21,22,18,12,13,5,6,15,14,19,26,25,29,32,33,43,48,49,86,91,93,1
- 23: 0,2,3,9,8,7,44,45,38,30,31,27,28,29,25,22,21,20,24,23,16,17,10,11,4,5,6,1,93,91,86,49,15,14,13,12,18,19,26,33,32,36,35,34,39,40,37,41,42,43,48,55,54,59,58,56,53,47,46,52,51,50,60,61,64,65,66,62,63,70,69,73,72,71,68,67,74,75,81,82,83,76,77,85,84,90,89,88,80,79,78,87,92
- 24: 0,1,93,91,86,85,77,76,73,69,70,63,55,54,53,47,41,37,35,34,31,30,23,24,27,28,29,25,26,33,32,36,42,43,48,49,15,6,5,13,14,19,18,22,21,20,17,16,8,9,10,11,4,3,2,7,44,45,38,39,40,46,52,56,58,59,62,66,65,72,71,68,64,61,57,51,50,60,67,74,75,81,82,83,84,90,89,88,80,79,78,87,92
- 25: 0,1,6,15,14,13,5,4,3,9,8,16,17,10,11,12,18,19,26,25,22,21,20,24,23,30,31,27,28,29,32,33,43,42,36,35,34,39,38,45,50,60,61,57,51,52,46,40,37,41,47,53,56,58,59,54,55,48,49,86,85,84,83,82,89,90,91,93,92,87,88,80,81,75,71,72,73,76,77,70,63,62,66,65,64,68,67,74,79,78,44,7,2
- 26: 92,93,1,6,5,4,11,12,13,14,15,49,86,85,84,90,89,88,87,78,79,80,81,82,83,76,77,70,69,73,72,71,75,74,67,68,64,65,66,62,63,55,48,43,33,32,29,25,26,19,18,22,21,28,27,31,30,38,39,34,35,36,42,41,37,40,46,47,53,54,59,58,56,52,51,57,61,60,50,45,44,7,8,16,23,24,20,17,10,9,3,2,0
- 27: 0,2,3,9,10,17,16,8,7,44,45,50,51,52,56,58,57,61,60,67,68,64,65,66,69,73,72,71,75,74,79,78,87,92,93,91,86,85,84,90,89,88,80,81,82,83,76,77,70,63,62,59,54,53,47,46,40,39,38,30,23,24,20,21,28,27,31,34,35,37,41,42,36,32,29,25,22,18,12,11,4,5,13,14,19,26,33,43,48,49,15,6,1

- 28: 0,1,6,5,13,12,18,19,14,15,49,48,55,54,53,56,58,59,62,63,70,69,66,65,64,68,71,72,73,76,77,85,86,91,93,92,87,78,79,80,88,89,90,84,83,82,81,75,74,67,60,61,57,51,52,46,47,41,42,43,33,26,25,22,21,28,29,32,36,35,37,40,39,34,31,27,24,20,17,10,11,4,3,9,8,16,23,30,38,45,44,7,2
- 29: 92,93,91,90,89,88,87,78,44,45,50,51,52,56,58,57,61,60,67,68,64,65,66,69,70,77,76,73,72,71,75,74,79,80,81,82,83,84,85,86,49,48,55,63,62,59,54,53,47,46,40,39,38,30,31,34,35,37,41,42,43,33,32,29,28,27,24,23,16,8,7,2,3,9,10,17,20,21,22,25,26,19,18,12,11,4,5,13,14,15,6,1,0
- 30: 0,2,7,8,9,3,4,5,13,14,19,18,12,11,10,17,16,23,24,20,21,22,25,26,33,32,29,28,27,31,30,38,39,34,35,36,42,43,48,55,63,62,59,54,53,47,41,37,40,46,52,56,58,57,51,50,45,44,78,79,80,81,82,89,88,87,92,93,91,90,84,83,76,73,72,71,75,74,67,60,61,64,65,66,69,70,77,85,86,49,15,6,1
- 31: 92,87,78,44,45,50,51,57,61,60,67,68,64,65,66,62,59,58,56,52,46,40,37,41,47,53,54,55,63,70,69,73,72,71,75,74,79,80,81,82,89,90,84,83,76,77,85,86,91,93,1,6,5,13,14,15,49,48,43,42,36,35,34,39,38,30,31,27,28,21,22,25,29,32,33,26,19,18,12,11,4,3,9,10,17,20,24,23,16,8,7,2,0
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- 33: 0,92,87,78,79,74,75,71,68,67,60,50,51,52,46,40,37,35,36,32,33,26,25,29,28,27,24,23,30,31,34,39,38,45,44,7,2,3,9,8,16,17,20,21,22,18,19,14,13,12,11,4,5,6,15,49,48,43,42,41,47,53,56,58,57,61,64,65,72,73,69,66,62,59,54,55,63,70,77,76,83,82,81,80,88,89,90,84,85,86,91,93,1
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- 35: 1,0,92,93,91,90,89,82,81,75,74,79,80,88,87,78,44,45,50,51,57,58,59,54,55,63,62,66,65,64,61,60,67,68,71,72,73,69,70,77,76,83,84,85,86,49,15,14,19,18,22,25,26,33,43,42,36,32,29,28,21,20,24,27,31,34,35,37,41,47,53,56,52,46,40,39,38,30,23,16,17,10,9,8,7,2,3,4,11,12,13,5,6
- 36: 0,2,3,9,8,7,44,45,38,39,34,31,30,23,24,27,28,29,32,36,35,37,40,46,52,56,53,47,41,42,43,33,26,25,22,21,20,17,10,11,4,5,13,12,18,19,14,15,6,1,93,91,90,84,85,86,49,48,55,54,59,58,57,51,50,60,61,64,65,72,73,69,66,62,63,70,77,76,83,82,89,88,80,81,75,71,68,67,74,79,78,87,92
- 37: 0,1,6,15,49,86,91,90,89,88,80,79,74,75,81,82,83,84,85,77,76,73,72,71,68,67,60,50,51,57,61,64,65,66,69,70,63,62,59,58,56,52,46,47,53,54,55,48,43,42,41,37,40,39,34,35,36,32,33,26,19,14,13,5,4,11,12,18,22,25,29,28,21,20,17,10,9,3,2,7,8,16,23,24,27,31,30,38,45,44,78,87,92
- 38: 92,87,78,44,7,2,3,4,5,13,14,19,18,12,11,10,9,8,16,17,20,21,22,25,26,33,43,42,36,32,29,28,27,24,23,30,31,34,35,37,41,47,46,40,39,38,45,50,51,52,56,53,54,59,58,57,61,60,67,74,79,80,88,89,82,81,75,71,68,64,65,72,73,76,83,84,90,91,86,85,77,70,69,66,62,63,55,48,49,15,6,1,93
- 39: 0,92,93,91,86,49,15,6,5,4,3,9,8,16,17,10,11,12,13,14,19,18,22,21,20,24,23,30,38,39,34,31,27,28,29,25,26,33,32,36,35,37,40,46,47,41,42,43,48,55,54,53,56,52,51,57,58,59,62,63,70,77,85,84,90,89,82,83,76,73,69,66,65,72,71,75,81,80,88,87,78,79,74,67,68,64,61,60,50,45,44,7,2
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- 41: 0,1,6,15,14,19,18,22,25,26,33,43,42,41,47,53,54,59,62,66,65,72,73,69,70,63,55,48,49,86,91,93,92,87,88,89,90,84,85,77,76,83,82,81,75,71,68,64,61,60,67,74,79,78,44,45,50,51,57,58,56,52,46,40,37,35,36,32,29,28,21,20,24,27,31,34,39,38,30,23,16,17,10,11,12,13,5,4,3,9,8,7,2
- 42: 0,2,3,4,11,12,13,5,6,1,93,91,90,84,83,76,73,72,65,64,68,71,75,81,82,89,88,80,79,74,67,60,61,57,58,59,54,53,56,52,51,50,45,38,39,34,35,37,40,46,47,41,42,36,32,29,25,26,33,43,48,55,63,62,66,69,70,77,85,86,49,15,14,19,18,22,21,28,27,31,30,23,24,20,17,10,9,8,7,44,78,87,92
- 43: 1,6,5,13,14,19,26,33,43,42,41,37,40,46,47,53,54,55,48,49,86,91,90,89,88,87,78,79,80,81,82,83,84,85,77,76,73,72,71,75,74,67,68,64,65,66,69,70,63,62,59,58,56,52,51,57,61,60,50,45,44,7,8,9,10,17,16,23,24,20,21,28,27,31,30,38,39,34,35,36,32,29,25,22,18,12,11,4,3,2,0,92,93
- 44: 0,2,3,4,5,13,12,11,10,9,8,7,44,45,38,30,23,16,17,20,24,27,31,34,39,40,46,47,53,56,52,51,50,60,67,74,75,81,80,79,78,87,88,89,82,83,76,73,72,71,68,64,61,57,58,59,54,55,63,62,66,69,70,77,85,84,90,91,86,49,48,43,42,41,37,35,36,32,33,26,25,29,28,21,22,18,19,14,15,6,1,93,92
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- 46: 0,92,87,88,80,81,75,71,68,67,74,79,78,44,45,38,30,31,34,39,40,37,35,36,42,41,47,46,52,56,53,54,59,58,57,51,50,60,61,64,65,72,73,76,77,70,69,66,62,63,55,48,43,33,32,29,28,27,24,23,16,17,20,21,22,25,26,19,14,13,12,11,10,9,8,7,2,3,4,5,6,15,49,86,85,84,83,82,89,90,91,93,1
- 47: 7,2,3,4,11,12,13,5,6,15,14,19,18,22,25,29,28,21,20,17,10,9,8,16,23,24,27,31,30,38,45,50,60,61,64,68,67,74,75,71,72,65,66,62,63,55,54,59,58,57,51,52,56,53,47,46,40,39,34,35,37,41,42,36,32,33,43,48,49,86,85,77,70,69,73,76,83,84,90,91,93,1,0,92,87,88,89,82,81,80,79,78,44
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- 50: 0,92,87,78,79,74,67,68,71,75,81,80,88,89,82,83,76,77,70,63,62,66,69,73,72,65,64,61,60,50,51,57,58,59,54,55,48,49,86,85,84,90,91,93,1,6,15,14,13,5,4,11,12,18,19,26,33,43,42,41,47,53,56,52,46,40,37,35,36,32,29,25,22,21,28,27,24,23,30,31,34,39,38,45,44,7,8,16,17,10,9,3,2
- 51: 0,92,87,88,89,82,81,80,79,78,44,7,2,3,9,8,16,23,30,38,45,50,60,61,64,68,67,74,75,71,72,65,66,62,63,55,54,59,58,57,51,52,56,53,47,46,40,39,34,31,27,28,29,25,22,21,20,17,10,11,4,5,6,15,14,13,12,18,19,26,33,32,36,35,37,41,42,43,48,49,86,85,77,70,69,73,76,83,84,90,91,93,1
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- 53: 0,2,3,4,5,6,1,93,91,90,84,85,86,49,15,14,13,12,11,10,9,8,7,44,45,38,39,34,31,30,23,16,17,20,24,27,28,29,25,22,18,19,26,33,32,36,35,37,40,46,52,56,53,47,41,42,43,48,55,54,59,58,57,51,50,60,61,64,65,72,73,69,66,62,63,70,77,76,83,82,89,88,80,81,75,71,68,67,74,79,78,87,92
- 54: 0,2,7,8,9,3,4,11,10,17,16,23,30,38,39,40,46,52,56,53,47,41,37,35,34,31,27,24,20,21,28,29,25,26,33,32,36,42,43,48,49,15,14,19,18,12,13,5,6,1,93,91,86,85,77,70,69,73,76,83,84,90,89,82,81,75,74,67,60,61,64,68,71,72,65,66,62,63,55,54,59,58,57,51,50,45,44,78,79,80,88,87,92
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56: 0,92,87,88,80,81,75,71,68,67,74,79,78,44,45,38,30,31,34,39,40,37,35,36,42,41,47,46,52,56,53,54,59,58,57,51,50,60,61,64,65,72,73,76,77,70,69,66,62,63,55,48,43,33,32,29,28,21,20,24,23,16,17,10,9,8,7,2,3,4,11,12,18,22,25,26,19,14,13,5,6,15,49,86,85,84,83,82,89,90,91,93,1

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59: 0,92,87,78,79,74,67,68,71,75,81,80,88,89,82,83,76,77,70,63,62,66,69,73,72,65,64,61,60,50,51,57,58,59,54,55,48,49,86,85,84,90,91,93,1,6,15,14,13,5,4,11,12,18,19,26,33,43,42,41,47,53,56,52,46,40,37,35,36,32,29,25,22,21,28,27,31,34,39,38,45,44,7,8,16,23,24,20,17,10,9,3,2

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69: 0,1,93,91,90,89,82,83,84,85,86,49,15,6,5,4,11,12,13,14,19,18,22,21,20,17,10,9,3,2,7,8,16,23,24,27,28,29,25,26,33,32,36,35,37,41,42,43,48,55,63,62,66,69,70,77,76,73,72,65,64,61,60,50,51,57,58,59,54,53,56,52,46,40,39,34,31,30,38,45,44,78,79,74,67,68,71,75,81,80,88,87,92

70: 0,2,3,9,10,11,4,5,6,15,14,13,12,18,19,26,33,32,29,25,22,21,28,27,31,30,23,24,20,17,16,8,7,44,78,79,80,81,75,74,67,68,71,72,73,69,70,63,62,66,65,64,61,60,50,45,38,39,34,35,36,42,41,37,40,46,47,53,56,52,51,57,58,59,54,55,48,49,86,91,90,84,85,77,76,83,82,89,88,87,92,93,1

71: 1,6,5,13,12,11,4,3,2,7,8,9,10,17,16,23,30,31,27,24,20,21,28,29,32,33,26,25,22,18,19,14,15,49,86,85,84,83,76,77,70,69,73,72,71,68,67,60,61,64,65,66,62,63,55,48,43,42,36,35,34,39,40,37,41,47,46,52,56,53,54,59,58,57,51,50,45,44,78,87,88,80,79,74,75,81,82,89,90,91,93,92,0

72: 92,87,78,44,45,50,60,67,74,75,81,80,88,89,82,83,84,90,91,93,1,6,15,14,13,5,4,3,9,10,11,12,18,19,26,33,43,42,36,32,29,25,22,21,28,27,31,34,35,37,41,47,53,56,58,59,54,55,48,49,86,85,77,76,73,69,70,63,62,66,65,72,71,68,64,61,57,51,52,46,40,39,38,30,23,24,20,17,16,8,7,2,0

73: 32,29,25,22,21,28,27,31,30,23,24,20,17,16,8,7,44,78,79,80,81,75,74,67,68,71,72,73,69,70,63,62,66,65,64,61,60,50,45,38,39,34,35,37,40,46,47,53,56,52,51,57,58,59,54,55,48,49,86,91,90,84,85,77,76,83,82,89,88,87,92,93,1,0,2,3,9,10,11,4,5,6,15,14,13,12,18,19,26,33,43,42,36

74: 31,27,24,20,21,28,29,32,33,26,25,22,18,19,14,15,49,86,85,84,83,76,77,70,69,73,72,71,68,67,60,61,64,65,66,62,63,55,48,43,42,36,35,37,41,47,46,52,56,53,54,59,58,57,51,50,45,44,78,87,88,80,79,74,75,81,82,89,90,91,93,92,0,1,6,5,13,12,11,4,3,2,7,8,9,10,17,16,23,30,38,39,34

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77: 92,87,78,79,74,67,60,50,45,44,7,8,9,10,11,12,18,19,26,25,22,21,28,29,32,33,43,42,36,35,34,31,27,24,20,17,16,23,30,38,39,40,37,41,47,46,52,56,53,54,59,58,57,61,64,68,71,75,81,80,88,89,82,83,76,77,70,69,73,72,65,66,62,63,55,48,49,86,85,84,90,91,93,1,6,15,14,13,5,4,3,2,0

78: 92,93,1,6,15,14,19,18,22,25,26,33,43,42,41,47,53,56,58,57,61,60,67,68,64,65,66,69,70,63,62,59,54,55,48,49,86,91,90,84,85,77,76,73,72,71,75,74,79,80,81,82,89,88,87,78,44,45,50,51,52,46,40,37,35,36,32,29,28,21,20,24,27,31,34,39,38,30,23,16,17,10,11,12,13,5,4,3,9,8,7,2,0

79: 61,64,68,71,72,65,66,62,63,70,69,73,76,77,85,86,49,15,14,13,12,18,19,26,25,22,21,20,24,23,30,31,27,28,29,32,33,43,48,55,54,59,58,56,53,47,46,40,37,41,42,36,35,34,39,38,45,44,7,2,3,9,8,16,17,10,11,4,5,6,1,0,92,93,91,90,84,83,82,89,88,87,78,79,80,81,75,74,67,60,50,51,57

80: 62,66,69,73,72,65,64,61,60,67,68,71,75,74,79,78,44,7,8,9,10,17,16,23,24,20,21,22,25,26,33,32,29,28,27,31,30,38,45,50,51,57,58,56,52,46,47,41,37,40,39,34,35,36,42,43,48,49,15,6,5,13,14,19,18,12,11,4,3,2,0,1,93,92,87,88,80,81,82,89,90,91,86,85,84,83,76,77,70,63,55,54,59

81: 93,91,86,85,77,70,63,55,48,49,15,14,13,12,11,10,17,16,23,24,20,21,28,27,31,30,38,39,34,35,36,32,29,25,22,18,19,26,33,43,42,41,37,40,46,47,53,56,52,51,57,58,59,62,66,69,73,76,83,84,90,89,82,81,75,74,67,68,71,72,65,64,61,60,50,45,44,78,79,80,88,87,92,0,2,7,8,9,3,4,5,6,1

82: 92,87,78,79,80,88,89,90,84,85,77,70,69,66,65,64,68,71,72,73,76,83,82,81,75,74,67,60,61,57,51,50,45,44,7,8,9,10,11,12,18,19,26,25,22,21,28,29,32,33,43,42,36,35,34,31,27,24,20,17,16,23,30,38,39,40,37,41,47,46,52,56,53,54,59,62,63,55,48,49,86,91,93,1,6,15,14,13,5,4,3,2,0

83: 0,1,6,5,4,3,2,7,44,45,38,39,40,37,35,34,31,30,23,24,27,28,29,25,26,19,18,22,21,20,17,16,8,9,10,11,12,13,14,15,49,48,43,33,32,36,42,41,47,46,52,51,50,60,61,57,58,56,53,54,55,63,62,66,65,64,68,67,74,79,78,87,88,80,81,75,71,72,73,69,70,77,76,83,82,89,90,84,85,86,91,93,92

84: 92,0,2,7,8,16,23,24,20,17,10,9,3,4,11,12,18,19,26,33,32,29,25,22,21,28,27,31,30,38,39,34,35,36,42,43,48,49,15,14,13,5,6,1,93,91,86,85,84,90,89,82,83,76,77,70,63,55,54,53,47,41,37,40,46,52,56,58,59,62,66,69,73,72,65,64,61,57,51,50,45,44,78,79,74,67,68,71,75,81,80,88,87

85: 92,93,1,6,5,13,12,18,22,25,26,19,14,15,49,48,55,63,62,59,54,53,56,58,57,51,52,46,47,41,37,40,39,34,35,36,42,43,33,32,29,28,21,20,17,16,23,24,27,31,30,38,45,50,60,67,68,64,65,66,69,70,77,76,73,72,71,75,74,79,80,81,82,83,84,85,86,91,90,89,88,87,78,44,7,8,9,10,11,4,3,2,0

86: 92,93,1,6,5,4,11,12,13,14,15,49,86,91,90,89,82,83,84,85,77,76,73,72,71,75,81,80,88,87,78,79,74,67,68,64,65,66,69,70,63,55,48,43,33,32,29,25,26,19,18,22,21,28,27,31,30,38,39,34,35,36,42,41,37,40,46,47,53,54,59,58,56,52,51,57,61,60,50,45,44,7,8,16,23,24,20,17,10,9,3,2,0

87: 93,1,6,15,14,19,26,25,22,18,12,13,5,4,11,10,17,16,23,30,31,27,24,20,21,28,29,32,33,43,42,36,35,34,39,38,45,44,7,8,9,3,2,0,92,87,78,79,80,88,89,82,81,75,74,67,60,50,51,52,46,40,37,41,47,53,56,58,57,61,64,68,71,72,65,66,62,59,54,55,48,49,86,85,77,70,69,73,76,83,84,90,91

88: 92,0,2,3,9,10,17,20,24,23,16,8,7,44,45,50,60,61,57,51,52,56,58,59,54,53,47,46,40,37,41,42,36,35,34,39,38,30,31,27,28,21,22,18,19,26,25,29,32,33,43,48,55,63,62,66,65,72,71,68,67,74,75,81,80,79,78,87,88,89,82,83,76,73,69,70,77,85,84,90,91,86,49,15,14,13,12,11,4,5,6,1,93

89: 92,93,1,6,5,13,12,18,22,25,26,19,14,15,49,48,55,63,62,59,54,53,56,58,57,51,52,46,47,41,37,40,39,34,35,36,42,43,33,32,29,28,21,20,17,16,23,24,27,31,30,38,45,50,60,61,64,65,72,73,69,70,77,76,83,84,85,86,91,90,89,82,81,75,71,68,67,74,79,80,88,87,78,44,7,8,9,10,11,4,3,2,0

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91: 78,87,88,89,82,83,84,90,91,86,85,77,76,73,69,66,65,72,71,75,81,80,79,74,67,68,64,61,60,50,45,38,30,31,27,24,23,16,17,20,21,28,29,32,33,43,42,36,35,34,39,40,37,41,47,46,52,51,57,58,56,53,54,59,62,63,55,48,49,15,14,19,26,25,22,18,12,13,5,6,1,93,92,0,2,3,4,11,10,9,8,7,44

92: 92,0,2,7,8,16,23,24,20,17,10,9,3,4,11,12,18,19,26,33,32,29,25,22,21,28,27,31,30,38,39,34,35,36,42,43,48,49,15,14,13,5,6,1,93,91,86,85,84,90,89,82,83,76,77,70,63,55,54,53,47,41,37,40,46,52,56,58,59,62,66,69,73,72,65,64,68,67,60,61,57,51,50,45,44,78,79,74,75,81,80,88,87

93: 92,87,78,79,80,88,89,82,81,75,74,67,60,50,51,52,46,40,37,41,47,53,56,58,57,61,64,68,71,72,65,66,69,70,63,62,59,54,55,48,49,86,85,77,76,83,84,90,91,93,1,6,15,14,19,26,25,22,18,12,13,5,4,11,10,17,16,23,30,31,27,24,20,21,28,29,32,33,43,42,36,35,34,39,38,45,44,7,8,9,3,2,0

94: 92,87,88,80,79,78,44,45,50,51,57,61,60,67,68,64,65,66,62,59,58,56,52,46,40,37,41,47,53,54,55,63,70,69,73,72,71,75,81,82,89,90,84,83,76,77,85,86,91,93,1,6,5,13,14,15,49,48,43,42,36,35,34,39,38,30,31,27,28,21,22,25,29,32,33,26,19,18,12,11,4,3,9,10,17,20,24,23,16,8,7,2,0

95: 92,0,2,3,9,10,17,20,24,23,16,8,7,44,45,50,60,61,57,51,52,56,58,59,54,53,47,46,40,37,41,42,36,35,34,39,38,30,31,27,28,21,22,18,19,26,25,29,32,33,43,48,55,63,62,66,65,64,68,67,74,75,71,72,73,69,70,77,85,84,83,82,81,80,79,78,87,88,89,90,91,86,49,15,14,13,12,11,4,5,6,1,93

96: 92,0,2,3,9,8,7,44,45,38,39,34,35,36,42,43,33,32,29,28,21,20,24,27,31,30,23,16,17,10,11,4,5,13,12,18,22,25,26,19,14,15,6,1,93,91,90,84,85,86,49,48,55,54,59,62,63,70,69,66,65,64,61,57,58,56,53,47,41,37,40,46,52,51,50,60,67,68,71,72,73,76,83,82,89,88,80,81,75,74,79,78,87

97: 92,87,88,80,79,74,67,60,50,51,52,56,53,47,46,40,39,38,45,44,7,2,3,4,5,6,15,14,13,12,11,10,9,8,16,17,20,21,22,18,19,26,25,29,28,27,24,23,30,31,34,35,37,41,42,36,32,33,43,48,49,86,85,84,83,76,77,70,69,73,72,65,66,62,63,55,54,59,58,57,61,64,68,71,75,81,82,89,90,91,93,1,0

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(Boris Schauerte) HODDENFELD 21, 44149 DORTMUND, GERMANY
E-mail address: Boris.Schauerte@cs.uni-dortmund.de

(Carol T. Zamfirescu) SÜDWALL 31, 44137 DORTMUND, GERMANY
E-mail address: czamfirescu@gmail.com

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
0	+	37	37	19	25	13	19	19	13	25	19	13	25	29	13	13	19	25
1	38	+	37	22	2	1	2	3	2	1	3	2	1	22	2	10	1	1
2	38	38	+	5	26	26	5	11	5	6	5	37	6	5	26	5	6	5
3	1	3	6	+	26	19	5	19	5	7	5	61	61	5	19	5	7	5
4	4	15	6	4	+	26	2	3	2	15	3	2	3	29	2	62	62	2
5	9	8	16	14	9	+	19	19	10	1	12	10	1	22	10	10	1	1
6	1	20	13	1	4	21	+	19	2	6	5	2	6	5	2	5	6	2
7	39	2	6	3	6	8	20	+	18	18	3	4	3	38	4	38	11	4
8	5	3	11	3	5	9	10	3	+	18	5	2	12	5	2	5	16	2
9	4	2	6	4	4	8	4	2	5	+	31	31	1	7	39	21	1	1
10	7	15	11	7	9	9	7	11	9	14	+	31	3	5	19	5	11	5
11	4	2	6	4	4	8	4	2	13	2	13	+	61	31	2	10	23	2
12	1	3	13	1	5	16	1	3	3	5	13	13	+	97	97	12	1	1
13	14	15	27	14	15	14	17	15	17	14	14	35	33	+	97	5	7	5
14	1	2	13	1	9	9	1	2	3	2	7	2	1	34	+	10	19	2
15	4	8	6	4	4	8	4	6	5	4	10	4	5	34	34	+	62	5
16	7	20	13	7	17	18	7	20	13	24	7	13	12	17	7	24	+	1
17	5	2	6	3	5	21	21	2	3	2	11	2	3	15	2	5	40	+
18	1	8	16	1	4	8	1	8	9	4	9	4	1	14	1	4	40	40
19	10	15	13	12	10	21	10	15	10	24	10	13	12	15	12	10	12	15
20	5	19	28	14	5	9	20	20	5	5	9	19	5	14	9	5	18	5
21	1	3	16	1	23	14	1	3	3	14	14	20	1	14	1	16	12	3
22	5	8	13	18	5	8	13	8	5	5	13	8	5	15	13	5	13	5
23	4	2	6	4	4	8	4	2	9	2	7	2	33	33	2	4	7	2
24	1	2	41	1	9	9	1	2	3	2	9	2	1	14	1	24	24	2
25	12	8	16	12	27	8	12	8	27	8	27	8	12	27	12	8	12	32
26	5	2	6	3	5	18	7	2	3	2	7	2	3	17	2	5	7	2
27	4	2	6	4	4	9	4	2	9	2	7	2	25	21	2	4	7	2
28	1	35	13	1	5	14	1	22	5	5	13	13	1	14	1	5	12	5
29	4	2	38	4	4	9	4	2	9	2	9	2	33	15	2	4	17	2
30	1	3	16	1	23	8	1	3	3	8	14	8	1	14	1	8	12	3
31	5	48	6	6	5	18	7	6	5	5	7	6	5	18	7	5	7	5
32	1	19	27	1	27	14	1	47	27	14	14	19	1	14	1	19	27	40
33	4	20	6	4	4	18	4	6	5	4	7	4	5	17	7	4	7	5
34	9	2	16	3	9	8	12	2	3	2	9	2	3	15	2	8	12	2
35	7	19	6	6	6	18	7	6	10	6	7	6	23	18	7	6	7	6
36	1	15	13	1	4	9	1	15	9	4	9	4	1	14	1	4	13	15
37	7	3	6	3	6	8	7	3	3	6	7	6	3	18	3	6	7	3
38	1	19	13	1	5	14	1	47	5	5	13	13	1	14	1	5	13	5
39	4	2	16	3	4	8	4	2	3	2	9	2	3	15	2	4	12	2
40	7	48	6	6	6	18	7	6	10	6	7	6	22	18	7	6	7	6
41	1	20	13	1	4	14	1	20	5	4	13	4	1	14	1	4	13	5
42	4	2	22	4	4	9	4	2	9	2	9	2	12	15	2	4	12	2
43	1	19	6	1	5	14	1	6	5	5	7	6	1	14	1	5	7	5
44	17	3	16	3	15	8	17	3	3	8	15	8	3	15	3	8	17	3
45	9	2	16	3	9	8	12	2	3	2	9	2	3	15	2	8	12	2
46	1	15	11	1	4	28	1	11	10	4	7	4	1	15	1	4	7	11

TABLE 1. Rows 0-46; Columns 0-17

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
47	5	2	16	3	5	8	12	2	3	2	17	2	3	17	2	5	12	2
48	10	3	13	3	10	8	10	3	3	8	10	8	3	18	3	8	13	3
49	1	15	6	1	4	9	1	6	9	4	9	4	1	14	1	4	12	6
50	7	2	13	3	10	8	7	2	3	2	7	2	3	21	2	8	7	2
51	5	15	6	6	5	14	17	6	5	5	14	6	5	14	20	5	17	5
52	5	2	16	7	5	16	7	2	5	2	7	2	5	17	2	5	7	2
53	1	33	11	1	4	9	1	11	9	4	9	4	1	18	1	4	12	11
54	7	2	6	3	6	8	7	2	3	2	7	2	3	14	2	6	7	2
55	5	19	22	12	5	18	12	22	5	5	17	19	5	17	12	5	12	5
56	1	15	11	1	4	9	1	11	9	4	9	4	1	15	1	4	13	11
57	5	24	6	6	5	14	7	6	5	5	7	6	5	14	7	5	7	5
58	1	19	11	1	4	9	1	11	9	4	9	4	1	29	1	4	29	11
59	10	2	13	3	10	8	10	2	3	2	10	2	3	15	2	8	12	2
60	9	19	6	6	6	9	21	6	9	6	9	6	23	14	9	6	18	6
61	4	2	13	4	4	9	4	2	9	2	9	2	12	33	2	4	12	2
62	14	3	6	3	6	8	20	3	3	6	14	6	3	14	3	6	20	3
63	1	19	11	1	5	16	1	11	5	5	7	19	1	17	1	5	7	5
64	38	3	6	3	6	8	25	3	3	6	11	6	3	42	3	6	25	3
65	1	15	16	1	5	16	1	15	5	5	7	20	1	15	1	5	7	5
66	5	15	16	16	5	16	17	15	5	5	15	19	5	15	20	5	17	5
67	1	24	11	1	4	9	1	11	9	4	7	4	1	14	1	4	7	11
68	12	2	22	3	23	8	12	2	3	2	26	2	3	26	2	8	12	2
69	1	29	11	1	4	16	1	11	5	4	7	4	1	17	1	4	7	5
70	9	15	30	18	9	9	20	15	9	19	9	19	23	15	9	19	18	15
71	1	2	6	1	4	8	1	2	3	2	7	2	1	17	1	4	7	2
72	4	2	11	4	4	9	4	2	9	2	9	2	12	14	2	4	12	2
73	17	3	16	3	17	8	17	3	3	8	17	8	3	17	3	8	17	3
74	1	15	11	1	4	9	1	11	9	4	7	4	1	15	1	4	7	11
75	12	2	6	3	6	8	12	2	3	2	26	2	3	26	2	6	12	2
76	5	15	6	6	5	16	17	6	5	5	15	6	5	15	20	5	17	5
77	4	2	11	3	4	8	4	2	3	2	9	2	3	14	2	4	12	2
78	1	15	27	1	5	19	1	15	5	5	15	19	1	15	1	5	20	5
79	10	2	6	3	6	8	10	2	3	2	10	2	3	14	2	6	12	2
80	5	33	16	14	5	14	17	16	5	5	14	61	5	14	25	5	17	5
81	1	19	13	1	10	18	1	24	10	19	7	13	1	18	1	10	7	26
82	5	2	6	6	5	14	12	2	5	2	14	2	5	14	2	5	12	2
83	7	24	13	7	10	16	7	16	10	24	7	13	13	17	7	10	7	23
84	4	2	6	3	4	8	4	2	3	2	9	2	3	15	2	4	12	2
85	1	19	22	1	5	14	1	22	5	5	14	19	1	14	1	5	27	5
86	7	24	6	6	6	16	7	6	10	6	7	6	13	17	7	6	7	6
87	4	37	11	4	4	9	4	11	9	4	7	4	16	17	7	4	7	11
88	1	19	6	1	5	18	1	6	5	5	7	6	1	18	1	5	7	5
89	10	2	13	12	10	14	10	2	10	2	10	2	12	14	2	10	12	2
90	1	3	11	1	4	8	1	3	3	4	9	4	1	15	1	4	20	3
91	4	2	11	3	4	8	4	2	3	2	9	2	3	15	2	4	12	2
92	1	19	6	1	6	14	1	6	10	6	10	6	1	14	1	6	13	6
93	5	29	6	6	5	16	7	6	5	5	7	6	5	18	7	5	7	5

TABLE 2. Rows 47-93; Columns 0-17

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
94	10	2	13	3	10	8	10	2	3	2	10	2	3	17	2	8	12	2
95	1	15	6	1	4	9	1	6	9	4	9	4	1	14	1	4	20	6
96	5	29	16	7	5	16	7	16	5	5	7	43	5	17	7	5	7	5
97	1	15	11	1	4	9	1	11	9	4	9	4	1	14	1	4	20	11
98	10	2	6	6	6	19	10	2	10	2	10	2	12	17	2	6	12	2
99	4	3	11	3	4	8	4	3	3	4	9	4	3	15	3	4	20	3
100	5	3	16	3	5	8	7	3	3	5	7	8	3	18	3	5	7	3
101	1	2	6	1	4	9	1	2	9	2	9	2	1	14	1	4	12	2
102	5	29	11	7	5	16	7	11	5	5	7	35	5	18	7	5	7	5
103	10	3	13	3	10	8	10	3	3	8	10	8	3	17	3	8	13	3
104	5	15	6	6	5	16	7	6	5	5	7	6	5	15	7	5	7	5
105	10	2	11	3	10	8	10	2	3	2	10	2	3	21	2	8	12	2
106	1	33	25	1	4	9	1	32	9	4	9	4	1	14	1	4	17	32
107	5	2	30	3	5	8	12	2	3	2	15	2	3	15	2	5	12	2
108	1	29	22	1	5	14	1	22	5	5	7	35	1	14	1	5	7	5
109	4	2	6	4	4	9	4	2	9	2	9	2	25	15	2	4	17	2
110	10	19	11	21	10	19	10	11	10	19	10	13	13	17	13	10	13	11
111	1	2	11	1	4	9	1	2	9	2	9	2	1	14	1	4	12	2
112	21	3	30	3	51	8	21	3	3	8	21	8	3	21	3	8	30	3
113	7	19	6	6	6	16	7	6	10	6	7	6	13	18	7	6	7	6
114	10	3	11	3	10	8	10	3	3	8	10	8	3	21	3	8	12	3
115	1	2	6	1	4	9	1	2	9	2	9	2	1	14	1	4	17	2
116	7	24	13	7	10	21	7	24	10	24	7	13	13	21	7	10	7	21
117	1	3	16	1	5	8	1	3	3	5	7	8	1	14	1	5	7	3
118	4	2	6	4	4	9	4	2	9	2	7	2	25	15	2	4	7	2
119	1	2	30	1	51	8	1	2	3	2	21	2	1	21	1	8	30	2
120	5	15	6	6	5	16	7	6	5	5	7	6	5	15	7	5	7	5
121	4	33	11	4	4	9	4	11	9	4	9	4	12	14	9	4	12	11
122	1	3	13	1	10	8	1	3	3	8	10	8	1	18	1	8	13	3
123	1	2	25	1	4	9	1	2	5	2	9	2	1	14	1	4	12	2
124	1	19	6	1	6	16	1	6	11	6	7	6	1	37	1	6	7	6
125	5	24	13	12	5	14	10	24	5	5	10	13	5	14	12	5	12	5
126	4	2	13	4	4	9	4	2	9	2	9	2	13	14	2	4	13	2
127	5	29	22	7	5	22	7	22	5	5	7	35	5	29	7	5	7	5
128	1	3	6	1	6	8	1	3	3	6	11	6	1	15	1	6	12	3
129	4	2	13	4	4	9	4	2	9	2	9	2	13	14	2	4	13	2
130	5	3	11	3	5	8	12	3	3	5	11	8	3	26	3	5	12	3
131	1	15	6	1	6	18	1	6	80	6	7	6	1	15	1	6	7	6
132	5	2	13	12	5	14	10	2	5	2	10	2	5	14	2	5	12	2
133	4	3	11	3	4	8	4	3	3	4	9	4	3	18	3	4	18	3
134	5	2	6	6	5	16	7	2	5	2	7	2	5	15	2	5	7	2
135	1	19	13	1	10	14	1	22	10	14	10	13	1	14	1	10	12	21
136	4	2	25	3	4	8	4	2	3	2	9	2	3	15	2	4	17	2
137	5	19	22	7	5	19	7	22	5	5	7	19	5	26	7	5	7	5
138	5	37	6	6	5	16	7	6	5	5	7	6	5	26	7	5	7	5
139	1	2	22	1	4	8	1	2	3	2	9	2	1	14	1	4	12	2
140	39	19	13	25	27	19	13	39	13	19	13	13	13	27	13	19	13	39

TABLE 3. Rows 94-140; Columns 0-17

	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
0	13	27	13	30	19	27	13	25	13	13	30	27	13	25	27	29	25	13
1	1	4	10	1	2	1	10	1	3	10	3	1	10	2	1	2	1	2
2	38	11	5	38	6	5	7	6	11	6	38	11	11	6	5	5	32	11
3	45	22	5	35	7	5	7	39	19	7	39	22	19	39	5	5	39	19
4	3	4	15	2	2	3	35	2	3	18	3	2	17	2	18	2	4	2
5	1	12	10	1	19	1	10	1	10	10	21	1	10	39	1	12	1	10
6	67	67	5	2	2	5	7	2	16	6	67	2	17	2	5	2	17	2
7	3	4	18	3	4	3	38	4	3	11	3	4	11	4	18	3	4	3
8	10	12	5	2	2	5	10	2	10	10	67	2	10	2	5	2	14	2
9	1	39	6	1	6	1	7	1	21	6	21	1	21	6	1	15	1	21
10	3	11	5	3	11	3	41	41	3	11	3	11	11	41	5	3	32	3
11	10	4	10	2	2	14	10	2	10	10	38	2	10	2	14	2	4	2
12	1	11	6	1	6	1	21	1	3	6	3	1	11	6	1	3	1	3
13	31	22	5	31	7	5	7	98	98	7	38	22	35	38	5	5	66	22
14	10	4	10	2	2	14	10	2	10	10	39	2	10	2	14	2	4	2
15	10	12	5	21	62	5	10	14	10	10	21	12	10	38	5	5	14	10
16	1	11	6	1	6	1	7	1	11	6	39	1	11	6	1	44	1	11
17	1	4	5	1	2	1	35	1	12	96	96	1	17	2	1	2	1	2
18	+	67	10	1	45	1	10	1	3	10	3	1	10	38	1	3	1	3
19	10	+	78	78	4	12	23	4	11	11	39	4	11	4	14	12	4	11
20	9	43	+	78	6	5	7	6	10	6	95	95	10	6	5	5	17	10
21	1	12	14	+	2	1	21	1	3	31	3	1	21	2	1	2	1	2
22	8	13	5	36	+	7	7	2	11	6	39	2	11	2	7	2	4	2
23	4	10	9	20	8	+	7	1	3	7	3	1	17	17	1	3	1	3
24	1	15	9	1	15	2	+	41	10	7	21	23	10	38	7	21	64	10
25	8	12	19	12	8	8	46	+	98	6	39	1	17	2	1	2	1	2
26	10	10	5	3	5	2	2	49	+	10	3	11	10	94	94	3	32	3
27	4	10	9	36	36	2	2	19	2	+	96	11	10	6	7	91	91	10
28	1	12	5	1	5	44	1	12	5	48	+	95	21	38	67	3	39	3
29	4	15	9	20	15	2	2	19	2	2	51	+	11	2	1	2	1	2
30	1	12	14	1	8	8	1	8	3	21	1	50	+	17	35	21	17	10
31	10	10	5	42	5	6	26	22	5	6	5	50	50	+	94	2	4	2
32	1	27	14	1	37	19	1	19	53	19	1	19	1	53	+	5	1	22
33	4	10	5	20	5	4	46	46	5	4	5	4	23	5	54	+	91	2
34	8	12	9	3	8	2	2	8	2	2	12	2	3	22	54	54	+	25
35	10	10	18	23	18	6	47	19	6	6	51	19	23	6	19	6	52	+
36	1	13	9	1	13	4	1	49	49	4	1	4	1	13	1	4	9	47
37	8	10	18	3	8	6	3	8	3	6	51	51	3	6	27	6	3	6
38	1	13	5	1	5	19	1	19	5	19	1	19	1	5	1	5	44	19
39	4	12	9	3	8	2	2	8	2	2	12	2	3	53	53	4	2	23
40	10	10	18	42	18	6	26	22	6	6	22	50	27	6	27	6	22	6
41	1	13	5	1	5	4	1	45	5	4	1	4	1	5	1	4	52	52
42	4	12	9	12	15	2	2	12	2	2	12	2	12	22	53	4	2	50
43	1	21	5	1	5	6	1	19	5	6	1	19	1	5	1	5	21	6
44	8	15	18	3	8	8	3	8	3	48	48	15	3	18	37	17	3	18
45	8	12	9	3	8	2	2	8	2	2	12	2	3	44	19	23	2	19
46	1	10	28	1	13	4	1	27	7	4	1	4	1	7	1	4	15	7

TABLE 4. Rows 0-46; Columns 18-35

	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
47	8	12	5	3	5	2	2	8	2	2	5	2	3	5	45	5	2	47
48	8	10	18	3	8	8	3	8	3	10	13	37	3	10	37	10	3	10
49	1	12	9	1	15	4	1	12	6	4	1	4	1	6	1	4	9	6
50	8	10	35	3	8	2	2	8	2	2	12	2	3	7	27	7	2	7
51	14	15	5	14	5	6	14	22	5	6	5	15	14	5	14	5	15	6
52	16	21	5	16	5	2	2	16	2	2	5	2	16	5	19	5	2	7
53	1	10	9	1	13	4	1	12	10	4	1	4	1	10	1	4	9	10
54	8	21	14	3	8	2	2	8	2	2	14	2	3	6	14	6	2	6
55	19	12	5	12	5	19	26	12	5	19	5	17	12	5	19	5	12	18
56	1	10	9	1	13	4	1	16	10	4	1	4	1	10	1	4	9	10
57	14	21	5	14	5	6	14	32	5	6	5	17	14	5	14	5	21	6
58	1	33	9	1	28	4	1	16	11	4	1	4	1	11	1	4	9	11
59	8	10	20	3	8	2	2	8	2	2	12	2	3	10	27	10	2	10
60	9	21	9	14	18	6	9	19	6	6	14	9	14	6	14	6	9	6
61	4	10	9	12	13	2	2	12	2	2	12	2	12	10	53	4	2	10
62	8	15	14	3	8	6	3	8	3	6	14	15	3	6	14	6	3	6
63	1	21	5	1	5	7	1	16	5	7	1	17	1	5	1	5	16	7
64	8	32	42	3	8	6	3	8	3	6	22	38	3	6	47	6	3	6
65	1	12	5	1	5	7	1	12	5	7	1	15	1	5	1	5	12	7
66	16	15	5	16	5	19	15	16	5	19	5	15	16	5	19	5	15	19
67	1	10	9	1	13	4	1	32	7	4	1	4	1	7	1	4	9	7
68	8	12	19	3	8	2	2	8	2	2	12	2	3	22	19	23	2	19
69	1	32	5	1	5	4	1	16	5	4	1	4	1	5	1	4	16	7
70	9	15	9	20	15	9	9	19	18	9	35	9	23	18	19	18	9	18
71	1	43	43	1	8	2	1	8	2	2	1	2	1	6	1	4	2	6
72	4	10	9	12	13	2	2	12	2	2	12	2	12	10	14	4	2	10
73	8	39	26	3	8	8	3	8	3	25	28	17	3	26	43	17	3	43
74	1	10	9	1	13	4	1	19	7	4	1	4	1	7	1	4	9	7
75	8	12	26	3	8	2	2	8	2	2	12	2	3	6	27	6	2	6
76	16	15	5	16	5	6	15	16	5	6	5	15	16	5	45	5	15	6
77	4	12	9	3	8	2	2	8	2	2	12	2	3	11	14	4	2	11
78	1	15	5	1	5	19	1	19	5	19	1	15	1	5	1	5	15	19
79	8	10	14	3	8	2	2	8	2	2	12	2	3	6	14	6	2	6
80	14	33	5	14	5	33	14	16	5	25	5	17	14	5	14	5	16	23
81	1	10	18	1	13	7	1	19	7	7	1	19	1	7	1	7	24	7
82	14	12	5	12	5	2	2	12	2	2	5	2	12	5	14	5	2	6
83	10	10	18	16	13	7	24	16	7	7	13	17	16	7	37	7	16	7
84	4	12	9	3	8	2	2	8	2	2	12	2	3	6	35	4	2	6
85	1	27	5	1	5	19	1	19	5	19	1	19	1	5	1	5	22	19
86	10	10	18	16	13	6	24	16	6	6	13	17	16	6	37	6	16	6
87	4	27	9	16	17	4	9	16	7	4	28	4	16	7	27	4	9	7
88	1	21	5	1	5	6	1	19	5	6	1	19	1	5	1	5	21	6
89	10	10	14	12	13	2	2	12	2	2	12	2	12	10	14	10	2	10
90	1	15	9	1	8	4	1	8	3	4	1	4	1	11	1	4	3	11
91	4	12	9	3	8	2	2	8	2	2	12	2	3	11	35	4	2	11
92	1	10	14	1	13	6	1	19	6	6	1	19	1	6	1	6	22	6
93	16	27	5	16	5	6	26	16	5	6	5	29	16	5	27	5	16	6

TABLE 5. Rows 47-93; Columns 18-35

	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
94	8	10	19	3	8	2	2	8	2	2	12	2	3	10	19	10	2	10
95	1	15	9	1	15	4	1	40	6	4	1	4	1	6	1	4	9	6
96	16	27	5	16	5	7	39	16	5	7	5	17	16	5	27	5	16	7
97	1	15	9	1	15	4	1	37	11	4	1	4	1	11	1	4	9	11
98	10	10	19	12	13	2	2	12	2	2	12	2	12	6	19	6	2	6
99	4	15	9	3	8	4	3	8	3	4	48	4	3	11	43	4	3	11
100	8	27	5	3	5	7	3	8	3	7	5	29	3	5	27	5	3	7
101	1	12	9	1	15	2	1	12	2	2	1	2	1	6	1	4	2	6
102	16	27	5	16	5	7	26	16	5	7	5	29	16	5	27	5	16	7
103	8	10	19	3	8	8	3	8	3	10	13	17	3	10	19	10	3	10
104	16	15	5	16	5	6	15	16	5	6	5	15	16	5	37	5	15	6
105	8	10	19	3	8	2	2	8	2	2	12	2	3	10	19	10	2	10
106	1	27	9	1	17	4	1	27	17	4	1	4	1	32	1	4	9	27
107	8	12	5	3	5	2	2	8	2	2	5	2	3	5	35	5	2	47
108	1	27	5	1	5	7	1	22	5	7	1	29	1	5	1	5	22	7
109	4	15	9	20	15	2	2	45	2	2	41	2	25	6	41	4	2	6
110	10	10	19	23	13	10	21	19	10	10	13	17	21	10	19	10	21	10
111	1	12	9	1	22	2	1	12	2	2	1	2	1	11	1	4	2	11
112	8	21	42	3	8	8	3	8	3	21	44	38	3	42	47	30	3	47
113	10	10	18	16	13	6	24	16	6	6	13	19	16	6	19	6	16	6
114	8	10	19	3	8	8	3	8	3	10	12	19	3	10	19	10	3	10
115	1	15	9	1	15	2	1	27	2	2	1	2	1	6	1	4	2	6
116	10	10	23	23	13	7	21	37	7	7	13	24	21	7	35	7	21	7
117	1	12	5	1	5	7	1	8	3	7	1	17	1	5	1	5	3	7
118	4	15	9	20	15	2	2	19	2	2	44	2	25	6	19	4	2	6
119	1	21	31	1	8	2	1	8	2	2	1	2	1	31	1	30	2	31
120	10	10	5	16	5	6	15	16	5	6	5	15	16	5	19	5	15	6
121	4	12	9	12	22	4	9	12	11	4	12	4	12	11	14	4	9	11
122	1	10	18	1	8	8	1	8	3	10	1	24	1	10	1	10	3	10
123	1	12	5	1	5	2	1	12	2	2	1	2	1	5	1	4	2	27
124	1	37	19	1	22	6	1	16	6	6	1	19	1	6	1	6	16	6
125	10	10	5	12	5	10	14	12	5	10	5	24	12	5	14	5	12	10
126	4	10	9	14	13	2	2	19	2	2	13	2	14	10	14	4	2	10
127	22	37	5	35	5	7	35	22	5	7	5	29	35	5	35	5	22	7
128	1	12	18	1	8	6	1	8	3	6	1	15	1	6	1	6	3	6
129	4	10	9	14	13	2	2	27	2	2	13	2	14	10	14	4	2	10
130	8	12	5	3	5	8	3	8	3	11	5	19	3	5	19	5	3	11
131	1	15	18	1	15	6	1	46	6	6	1	15	1	6	1	6	15	6
132	10	10	5	12	5	2	2	12	2	2	5	2	12	5	14	5	2	10
133	4	30	9	3	8	4	3	8	3	4	44	4	3	11	19	4	3	11
134	16	15	5	16	5	2	2	16	2	2	5	2	16	5	19	5	2	6
135	1	10	14	1	13	10	1	12	10	10	1	19	1	10	1	10	12	10
136	4	15	9	3	8	2	2	8	2	2	35	2	3	18	35	4	2	18
137	19	39	5	35	5	7	26	19	5	7	5	19	35	5	19	5	22	7
138	16	32	5	16	5	6	26	16	5	6	5	37	16	5	37	5	16	6
139	1	10	9	1	8	2	1	8	2	2	1	2	1	10	1	4	2	10
140	19	13	19	30	13	19	35	19	25	19	13	19	25	13	19	13	39	19

TABLE 6. Rows 94-140; Columns 18-35

	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53
0	25	13	25	40	25	25	13	30	27	40	13	25	13	25	19	13	19	25
1	15	3	18	1	3	3	2	1	17	1	2	18	1	2	1	2	1	4
2	5	32	5	6	5	11	6	11	5	6	44	5	6	11	11	37	5	7
3	5	19	5	75	5	26	19	35	5	44	19	5	19	26	19	44	5	7
4	15	3	18	2	3	3	2	4	17	4	2	18	62	2	3	2	18	4
5	28	10	22	1	22	23	10	1	27	1	10	22	1	12	1	10	1	23
6	5	17	5	2	5	15	2	15	5	6	2	5	6	2	15	2	5	7
7	18	3	11	4	3	3	19	4	18	4	3	18	19	3	3	44	18	4
8	5	10	5	2	5	16	2	14	5	14	2	5	10	2	23	2	5	16
9	6	21	7	1	7	15	6	1	7	1	21	6	1	15	1	84	1	7
10	5	3	5	12	3	3	12	11	5	44	3	5	19	3	3	12	5	11
11	28	10	23	2	27	4	2	4	17	4	2	27	10	2	4	2	27	4
12	6	3	11	1	3	3	6	1	16	1	3	6	1	3	1	12	1	11
13	5	67	5	38	5	45	38	35	5	38	76	5	22	35	35	37	5	7
14	28	10	23	2	26	4	2	4	17	4	2	26	10	2	4	2	19	4
15	5	10	5	12	5	61	10	14	5	14	10	5	10	12	21	10	5	27
16	6	19	7	1	7	11	6	1	7	1	19	6	1	11	1	37	1	7
17	5	17	5	1	5	4	2	1	5	1	2	5	1	2	1	2	1	4
18	18	3	18	1	3	3	10	1	18	1	3	18	1	3	1	10	1	18
19	44	39	11	4	22	4	12	4	27	4	12	22	14	4	4	12	22	4
20	5	10	5	6	5	15	6	15	5	6	10	5	6	15	15	10	5	7
21	30	3	30	1	3	3	2	1	30	1	2	31	1	2	1	2	1	76
22	6	19	7	2	7	4	2	4	7	4	2	6	6	2	4	2	6	4
23	5	3	5	1	3	3	12	1	5	1	3	5	1	3	1	12	1	7
24	7	10	7	38	7	23	10	23	7	38	10	7	10	21	21	10	7	7
25	6	17	18	1	18	4	2	1	17	1	2	6	1	2	1	2	1	4
26	16	3	11	12	3	3	10	11	16	44	3	16	10	3	3	10	19	11
27	6	10	7	6	7	11	6	11	7	6	10	6	6	11	11	10	6	7
28	30	3	30	38	3	3	21	30	30	38	3	38	62	3	3	44	21	39
29	93	93	11	1	22	4	2	1	27	1	2	22	1	2	1	2	1	4
30	28	10	11	92	92	11	10	11	17	44	10	28	10	11	11	10	19	11
31	6	17	25	2	25	4	2	4	17	4	2	6	6	2	4	2	6	4
32	5	67	5	1	5	90	90	1	5	1	76	5	1	35	1	14	1	7
33	5	3	5	2	3	3	2	15	5	15	2	5	87	2	3	2	5	87
34	25	17	25	1	25	4	17	1	17	1	17	25	1	4	1	14	1	4
35	25	3	11	2	3	3	2	11	89	89	2	22	10	2	3	2	19	11
36	+	93	5	6	5	15	6	15	5	6	44	5	6	15	15	37	5	7
37	21	+	32	32	3	3	10	62	17	62	3	32	10	3	3	10	19	17
38	1	56	+	32	5	11	28	11	5	44	44	5	22	11	11	37	5	7
39	4	3	57	+	92	4	2	1	32	1	2	6	1	2	1	2	1	4
40	42	6	57	57	+	3	30	30	5	92	3	5	22	3	3	76	5	7
41	1	25	1	4	55	+	90	4	16	4	3	16	62	3	3	84	84	4
42	4	56	56	2	22	4	+	30	17	6	2	6	6	2	19	2	6	17
43	1	6	1	21	6	1	58	+	30	1	88	88	1	4	1	14	1	4
44	15	3	37	3	18	17	15	59	+	89	17	5	86	86	30	17	5	7
45	9	3	19	2	55	55	2	19	3	+	44	6	1	4	1	14	1	4
46	1	7	1	4	7	1	4	1	15	15	+	88	10	2	3	2	19	17

TABLE 7. Rows 0-46; Columns 36-53

	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53
47	47	3	5	2	22	5	2	5	3	2	60	+	6	25	85	85	5	7
48	13	3	13	3	10	13	58	58	3	3	10	3	+	86	1	10	1	87
49	1	6	1	4	6	1	4	1	15	9	1	12	16	+	3	2	21	4
50	13	3	13	2	7	13	2	7	3	2	7	2	3	12	+	85	1	4
51	14	6	5	15	6	5	15	5	15	15	15	5	18	6	29	+	84	17
52	21	7	5	2	7	5	2	5	16	2	7	2	16	16	2	5	+	7
53	1	10	1	4	10	1	4	1	18	9	1	12	10	1	10	18	63	+
54	14	3	14	2	6	14	2	6	3	2	7	2	3	6	2	6	2	74
55	30	18	5	12	18	5	12	5	17	12	43	5	18	12	12	5	5	12
56	1	10	1	4	10	1	4	1	15	9	1	16	10	1	10	15	16	1
57	14	6	5	17	6	5	17	5	17	21	7	5	18	6	7	5	5	18
58	1	11	1	4	11	1	4	1	16	9	1	16	16	1	29	29	16	1
59	13	3	13	2	10	13	2	27	3	2	10	2	3	12	2	15	2	10
60	9	6	14	9	6	14	9	6	18	9	60	60	18	6	21	6	19	9
61	4	10	13	2	10	4	2	59	59	2	4	2	10	4	2	22	2	4
62	14	3	14	3	6	14	15	6	3	3	15	3	3	6	3	6	63	63
63	1	7	1	16	7	1	17	1	16	16	1	5	16	1	7	5	5	1
64	38	3	47	3	6	25	22	6	3	3	11	3	3	6	3	6	22	11
65	1	7	1	12	7	1	12	1	15	12	1	5	16	1	7	5	5	1
66	15	16	5	15	22	5	15	5	15	15	15	5	16	15	52	5	5	74
67	1	7	1	4	7	1	4	1	18	9	1	25	10	1	7	14	7	1
68	44	3	19	2	22	29	2	19	3	2	27	2	3	12	2	22	2	12
69	1	7	1	4	7	1	4	1	16	16	1	5	16	1	7	5	5	1
70	9	18	19	9	18	20	9	19	15	9	15	20	18	9	35	15	19	9
71	1	3	1	2	6	1	2	1	3	2	1	2	3	1	2	6	2	1
72	4	10	13	2	10	4	2	11	15	2	4	2	10	4	2	14	2	4
73	28	3	28	3	26	17	17	28	3	3	28	3	3	16	3	17	16	25
74	1	7	1	4	7	1	4	1	15	9	1	20	10	1	7	15	7	1
75	38	3	44	2	6	29	2	6	3	2	27	2	3	6	2	6	2	12
76	15	6	5	15	6	5	15	5	15	15	15	5	16	6	38	5	5	39
77	4	3	14	2	11	4	2	11	3	2	4	2	3	4	2	14	2	4
78	1	26	1	15	26	1	15	1	15	15	1	5	26	1	27	5	5	1
79	13	3	13	2	6	13	2	6	3	2	10	2	3	6	2	6	2	10
80	14	16	5	16	22	5	17	5	16	16	28	5	16	14	67	5	5	25
81	1	7	1	24	7	1	24	1	18	19	1	26	10	1	7	18	7	1
82	14	6	5	2	6	5	2	5	23	2	27	2	23	6	2	5	2	12
83	13	7	13	16	7	13	17	7	16	16	7	16	10	16	7	17	7	10
84	4	3	35	2	6	4	2	6	3	2	4	2	3	4	2	6	2	4
85	1	27	1	29	22	1	22	1	29	19	1	5	30	1	27	5	5	1
86	13	6	13	16	6	13	17	6	16	16	7	16	10	6	7	6	7	10
87	4	7	28	4	7	4	4	7	16	9	4	16	16	4	7	17	7	4
88	1	6	1	21	6	1	22	1	18	19	1	5	18	1	7	5	5	1
89	13	10	13	2	10	13	2	14	17	2	10	2	10	12	2	14	2	10
90	1	3	1	3	11	1	4	1	3	3	1	3	3	1	3	15	19	1
91	4	3	35	2	11	4	2	11	3	2	4	2	3	4	2	15	2	4
92	1	6	1	24	6	1	22	1	31	19	1	22	10	1	10	6	19	1
93	28	6	5	16	6	5	22	5	16	16	7	5	16	6	7	5	5	18

TABLE 8. Rows 47-93; Columns 36-53

	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53
94	13	3	13	2	10	13	2	19	3	2	10	2	3	12	2	17	2	10
95	1	6	1	4	6	1	4	1	15	9	1	20	42	1	38	6	38	1
96	28	7	5	16	7	5	17	5	16	16	7	5	16	16	7	5	5	18
97	1	11	1	4	11	1	4	1	15	9	1	20	23	1	35	14	35	1
98	13	6	13	2	6	13	2	6	17	2	10	2	10	6	2	6	2	10
99	4	3	45	3	11	4	4	11	3	3	4	3	3	4	3	15	16	4
100	30	3	5	3	7	5	22	5	3	3	7	3	3	16	3	5	5	18
101	1	6	1	2	6	1	2	1	15	2	1	2	32	1	2	6	2	1
102	28	7	5	16	7	5	22	5	16	16	7	5	16	11	7	5	5	11
103	13	3	13	3	10	13	17	19	3	3	10	3	3	39	3	17	17	10
104	15	6	5	15	6	5	15	5	15	15	7	5	16	6	7	5	5	18
105	13	3	13	2	10	13	2	11	3	2	10	2	3	11	2	22	2	10
106	1	25	1	4	27	1	4	1	17	9	1	17	25	1	27	14	17	1
107	15	3	5	2	26	5	2	5	3	2	15	2	3	12	2	5	2	12
108	1	7	1	29	7	1	22	1	18	33	1	5	18	1	7	5	5	1
109	4	6	41	2	6	4	2	6	15	2	4	2	25	4	2	6	2	4
110	13	10	13	17	10	13	17	11	17	19	10	17	10	11	10	17	17	10
111	1	11	1	2	11	1	2	1	23	2	1	2	23	1	2	14	2	1
112	21	3	44	3	42	30	38	21	3	3	38	3	3	39	3	30	21	30
113	13	6	13	16	6	13	22	6	16	16	7	16	10	6	7	6	7	10
114	13	3	13	3	10	13	12	11	3	3	10	3	3	11	3	26	16	10
115	1	6	1	2	6	1	2	1	15	2	1	2	18	1	2	6	2	1
116	13	7	13	21	7	13	24	7	23	21	7	60	10	28	7	61	7	10
117	1	3	1	3	7	1	12	1	3	3	1	3	3	1	3	5	5	1
118	4	6	19	2	6	4	2	6	15	2	4	2	25	4	2	6	2	4
119	1	3	1	2	31	1	2	1	3	2	1	2	3	1	2	30	2	1
120	13	6	5	15	6	5	15	5	15	15	7	5	10	6	7	5	5	10
121	4	11	14	4	11	4	4	11	23	9	4	12	23	4	12	14	22	4
122	1	3	1	3	10	1	24	1	3	3	1	3	3	1	3	18	21	1
123	1	25	1	2	26	1	2	1	15	2	1	2	25	1	2	5	2	1
124	1	6	1	16	6	1	22	1	16	16	1	16	16	1	7	6	7	1
125	13	10	5	12	10	5	12	5	31	12	10	5	10	12	10	5	5	10
126	4	10	13	2	10	4	2	14	17	2	4	2	10	4	2	14	2	4
127	35	7	5	29	7	5	22	5	29	37	7	5	31	45	7	5	5	31
128	1	3	1	3	6	1	12	1	3	3	1	3	3	1	3	6	16	1
129	4	10	13	2	10	4	2	14	17	2	4	2	10	4	2	14	2	4
130	30	3	5	3	11	5	12	5	3	3	11	3	3	11	3	5	5	11
131	1	6	1	15	6	1	15	1	15	15	1	20	18	1	7	6	7	1
132	13	10	5	2	10	5	2	5	16	2	10	2	10	12	2	5	2	10
133	4	3	19	3	11	4	4	11	3	3	4	3	3	4	3	18	19	4
134	15	6	5	2	6	5	2	5	15	2	7	2	16	6	2	5	2	25
135	1	10	1	12	10	1	12	1	23	12	1	12	10	1	10	14	19	1
136	4	3	35	2	18	4	2	35	3	2	4	2	3	4	2	15	2	4
137	35	7	5	29	7	5	22	5	26	19	7	5	26	39	7	5	5	26
138	38	6	5	16	6	5	38	5	16	16	7	5	16	6	7	5	5	11
139	1	3	1	2	10	1	2	1	3	2	1	2	3	1	2	14	2	1
140	13	25	13	25	27	13	29	19	29	19	13	25	13	28	13	25	19	13

TABLE 9. Rows 94-140; Columns 36-53

	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70
0	13	19	35	13	27	13	25	13	19	25	28	27	13	25	13	25	19
1	10	1	2	10	2	1	14	2	1	2	15	2	1	3	2	1	9
2	6	5	6	7	5	7	5	6	5	11	5	6	7	16	11	6	26
3	7	5	35	7	5	7	5	22	5	22	5	26	7	26	44	7	19
4	17	29	2	17	2	18	17	2	15	2	15	2	4	3	2	2	9
5	10	1	12	10	12	1	14	10	1	12	28	12	1	26	10	1	19
6	6	5	2	7	2	7	5	2	5	2	5	2	7	16	2	2	15
7	18	19	3	18	38	18	45	3	19	3	38	3	4	3	4	3	9
8	10	5	2	10	2	10	5	2	5	2	5	2	10	16	2	2	18
9	6	1	6	7	6	1	25	6	1	21	6	6	1	25	15	1	15
10	16	5	3	16	5	19	5	3	5	3	5	3	11	3	11	3	19
11	10	14	2	10	2	10	14	2	27	2	17	2	4	17	2	2	9
12	6	1	3	16	6	1	16	3	1	3	6	3	1	3	11	1	15
13	7	5	35	7	5	7	5	22	5	22	5	29	7	67	37	7	35
14	10	14	2	10	2	10	14	2	19	2	17	2	4	17	2	2	9
15	10	5	12	10	5	10	5	10	5	12	5	12	10	28	10	76	76
16	6	1	6	7	6	1	16	6	1	11	6	6	1	16	11	1	19
17	17	1	2	17	2	1	5	2	1	2	5	2	1	17	2	1	9
18	10	1	3	10	38	1	28	3	1	3	28	3	1	3	10	1	18
19	39	14	4	23	12	26	14	12	26	4	39	12	4	26	4	4	9
20	6	5	6	7	5	7	5	6	5	25	5	6	7	16	10	6	15
21	31	1	2	31	2	1	78	2	1	2	38	2	1	3	2	1	30
22	6	19	2	7	2	7	25	2	15	2	6	2	4	25	2	2	9
23	7	1	3	7	5	1	5	3	1	3	5	3	1	3	12	1	18
24	7	41	21	7	23	7	23	10	38	21	28	38	7	28	10	7	23
25	6	1	2	17	2	1	14	2	1	2	6	2	1	17	2	1	9
26	10	19	3	10	12	10	16	3	19	3	16	3	10	3	10	3	19
27	6	19	6	7	6	7	16	6	19	11	6	6	7	16	10	6	18
28	39	30	3	67	38	30	67	3	30	3	38	3	21	3	44	3	30
29	31	1	2	23	2	1	14	2	1	2	71	2	1	26	2	1	9
30	10	19	11	10	23	10	17	10	19	11	17	44	10	17	10	11	19
31	6	41	2	17	2	41	17	2	15	2	6	2	4	17	2	2	9
32	7	1	35	7	5	1	5	14	1	14	5	27	1	67	14	1	18
33	83	5	2	26	2	26	5	2	5	2	5	2	15	3	2	2	15
34	17	1	4	17	14	1	14	14	1	4	17	27	1	17	4	1	9
35	10	19	2	10	2	10	22	2	19	2	71	2	10	3	2	2	19
36	6	5	6	7	5	7	5	6	5	25	5	6	7	16	15	6	15
37	10	19	3	10	76	10	17	3	19	3	17	3	10	3	10	3	19
38	7	5	11	7	5	7	5	22	5	11	5	26	7	16	11	7	18
39	6	1	2	32	2	1	14	2	1	2	6	2	1	77	2	1	9
40	7	5	3	7	5	7	5	3	5	3	5	3	7	3	45	3	18
41	16	45	3	16	23	26	16	3	15	3	15	3	4	3	4	3	9
42	6	19	2	10	2	10	17	2	19	2	6	2	10	17	2	2	19
43	37	1	4	23	14	1	14	14	1	4	15	70	1	61	4	1	9
44	7	5	39	7	5	7	5	27	5	78	5	27	7	16	28	7	18
45	6	1	4	67	6	1	14	6	1	4	6	6	1	67	4	1	9
46	10	19	2	10	2	10	17	2	19	2	17	2	10	3	2	2	19

TABLE 10. Rows 0-46; Columns 54-71

	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70
47	6	5	6	7	5	7	5	6	5	22	5	6	7	16	28	6	18
48	6	1	6	10	6	1	14	6	1	14	6	6	1	81	10	1	19
49	83	83	2	23	2	26	23	2	15	2	15	2	4	3	2	2	9
50	39	1	3	23	23	1	23	3	1	3	15	3	1	3	4	1	9
51	10	14	2	10	2	10	14	2	77	2	17	2	10	17	2	2	37
52	6	1	6	7	5	1	5	6	1	21	5	6	1	28	28	1	18
53	7	27	4	7	23	7	16	27	27	4	16	27	4	16	4	4	9
54	+	83	6	7	6	7	16	6	81	81	6	6	7	16	10	6	18
55	65	+	82	82	5	1	5	14	1	14	5	27	1	61	14	1	19
56	65	65	+	82	2	66	66	2	15	2	6	2	4	3	2	2	9
57	6	5	73	+	23	7	16	10	26	23	16	26	7	16	10	7	18
58	29	19	1	64	+	27	5	2	5	2	5	2	77	77	2	2	23
59	2	12	10	64	64	+	66	10	1	80	80	26	1	26	10	1	18
60	6	18	9	6	9	70	+	14	5	14	5	79	79	16	14	16	23
61	2	12	4	24	4	2	9	+	27	2	6	2	10	3	2	2	35
62	3	23	15	6	23	3	6	71	+	81	5	26	1	26	15	1	15
63	7	5	1	5	1	26	18	71	71	+	80	2	4	3	2	2	9
64	3	22	11	6	11	3	6	22	3	11	+	6	15	16	15	6	15
65	7	5	1	5	1	12	18	12	15	1	75	+	79	3	2	2	26
66	74	5	15	5	16	15	19	22	15	5	22	5	+	77	4	1	9
67	7	18	1	7	1	10	9	4	14	1	11	1	68	+	28	3	26
68	2	12	73	73	19	2	19	2	3	19	3	12	19	69	+	2	9
69	7	5	1	5	1	70	70	4	28	1	11	1	5	1	29	+	76
70	35	18	9	18	9	15	9	9	15	18	42	15	15	9	19	35	+
71	2	17	1	6	1	2	6	2	3	1	3	1	16	1	2	1	76
72	2	12	4	14	4	2	9	2	14	11	11	12	15	4	2	4	9
73	3	17	16	17	16	3	39	25	3	16	3	16	16	25	3	16	26
74	7	18	1	7	1	10	9	4	15	1	11	1	15	1	19	1	9
75	2	12	39	6	29	2	6	2	3	26	3	12	68	68	2	29	26
76	6	5	15	5	16	15	6	38	6	5	6	5	5	69	69	5	15
77	2	12	4	14	4	2	9	2	3	11	3	12	22	4	2	4	9
78	27	5	1	5	1	15	19	38	15	1	38	1	5	1	19	1	15
79	2	12	10	6	33	2	6	2	3	21	3	12	22	10	2	35	35
80	14	5	16	5	16	22	14	22	14	5	22	5	5	14	22	5	23
81	7	18	1	7	1	10	18	10	37	1	32	1	19	1	19	1	18
82	2	5	33	5	23	2	6	2	6	5	6	5	5	14	2	5	23
83	7	17	10	7	16	10	18	10	23	7	25	7	16	7	23	7	18
84	2	12	4	6	4	2	6	2	3	11	3	12	15	4	2	4	9
85	14	5	1	5	1	22	14	22	14	1	22	1	5	1	19	1	19
86	6	17	10	6	16	10	6	10	6	7	6	7	16	7	37	7	18
87	7	17	4	7	4	27	9	4	23	7	11	7	16	4	23	4	9
88	6	5	1	5	1	22	6	22	6	1	6	1	5	1	19	1	18
89	2	12	10	14	33	2	14	2	14	17	85	12	17	10	2	17	37
90	3	19	1	21	1	3	9	4	3	1	3	1	15	1	3	1	9
91	2	12	4	21	4	2	9	2	3	11	3	12	15	4	2	4	9
92	6	19	1	6	1	10	6	10	6	1	6	1	19	1	19	1	19
93	6	5	16	5	16	22	6	22	6	5	6	5	5	7	22	5	18

TABLE 11. Rows 47-93; Columns 54-71

	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70
94	2	12	10	17	19	2	19	2	3	17	3	12	17	10	2	17	19
95	6	64	1	6	1	15	6	4	6	1	6	1	15	1	44	1	9
96	7	5	16	5	16	27	18	32	28	5	32	5	5	7	27	5	18
97	14	23	1	14	1	15	9	4	14	1	11	1	15	1	23	1	9
98	2	12	10	6	19	2	6	2	6	17	6	12	17	10	2	17	19
99	3	23	4	25	4	3	9	4	3	11	3	15	15	4	3	4	9
100	3	5	16	5	16	3	18	22	3	5	3	5	5	7	3	5	18
101	2	12	1	6	1	2	6	2	6	1	6	1	15	1	2	1	9
102	7	5	11	5	11	22	18	22	23	5	11	5	5	7	22	5	18
103	3	17	10	17	19	3	19	10	3	17	3	21	17	10	3	17	19
104	6	5	15	5	16	15	6	25	6	5	6	5	5	7	29	5	15
105	2	12	10	21	11	2	19	2	3	11	3	12	19	10	2	11	19
106	14	17	1	14	1	27	9	4	14	1	25	1	17	1	27	1	9
107	2	5	15	5	29	2	21	2	3	5	3	5	5	21	2	5	15
108	7	5	1	5	1	22	14	22	14	1	22	1	5	1	22	1	18
109	2	17	4	6	4	2	6	2	6	17	6	15	15	4	2	4	9
110	21	17	10	17	11	10	19	10	23	11	11	21	17	10	19	11	19
111	2	12	1	14	1	2	9	2	14	1	11	1	22	1	2	1	9
112	3	30	39	21	39	3	21	38	3	21	3	21	62	21	3	38	30
113	6	18	10	6	11	10	6	10	6	7	6	7	16	7	19	7	18
114	3	12	10	21	11	3	19	10	3	11	3	12	16	10	3	11	19
115	2	17	1	6	1	2	6	2	6	1	6	1	15	1	2	1	9
116	7	23	10	7	23	10	21	10	23	7	38	7	23	7	23	7	23
117	3	5	1	5	1	3	14	12	3	1	3	1	5	1	3	1	18
118	2	19	4	6	4	2	6	2	6	7	6	7	15	4	2	4	9
119	2	30	1	21	1	2	21	2	3	1	3	1	71	1	2	1	30
120	6	5	10	5	16	10	6	10	6	5	6	5	5	7	19	5	15
121	14	12	4	14	4	12	9	4	14	11	11	12	22	4	12	4	9
122	3	18	1	18	1	3	18	10	3	1	3	1	28	1	3	1	18
123	2	5	1	5	1	2	9	2	14	1	25	1	5	1	2	1	9
124	6	19	1	6	1	22	6	22	6	1	6	1	16	1	19	1	19
125	14	5	10	5	28	10	14	10	14	5	32	5	5	10	12	5	76
126	2	17	4	14	4	2	9	2	14	17	75	75	17	4	2	4	9
127	7	5	42	5	29	22	31	22	37	5	22	5	5	7	22	5	35
128	3	12	1	6	1	3	6	12	3	1	3	1	15	1	3	1	15
129	2	17	4	14	4	2	9	2	14	17	38	31	17	4	2	4	9
130	3	5	11	5	11	3	19	12	3	5	3	5	5	11	3	5	19
131	6	18	1	6	1	15	6	25	6	1	6	1	15	1	69	1	15
132	2	5	10	5	16	2	14	2	14	5	22	5	5	10	2	5	18
133	3	18	4	18	4	3	9	4	3	11	3	18	19	4	3	4	9
134	2	5	15	5	16	2	6	2	6	5	6	5	5	7	2	5	15
135	14	12	1	14	1	10	14	10	14	1	22	1	19	1	12	1	19
136	2	17	4	17	4	2	9	2	3	17	3	15	15	4	2	4	9
137	7	5	39	5	19	22	19	22	44	5	22	5	5	7	19	5	19
138	6	5	11	5	11	26	6	32	6	5	6	5	5	7	26	5	26
139	2	12	1	14	1	2	9	2	3	1	3	1	15	1	2	1	9
140	27	19	13	25	19	13	19	13	28	19	25	29	19	13	19	25	19

TABLE 12. Rows 94-140; Columns 54-71