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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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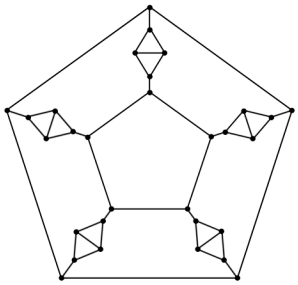

Fig. 1

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:

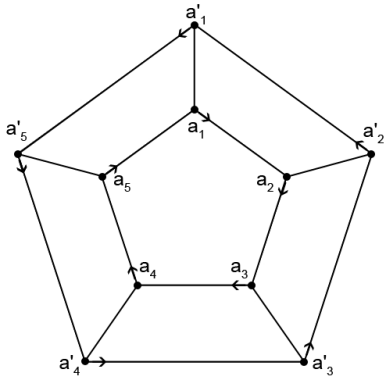

Fig. 2

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

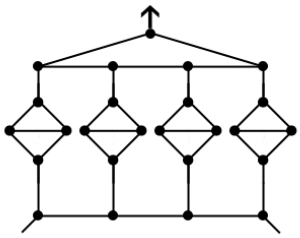

Fig. 3

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 $a_1a_2a_2'a_3'a_3a_4a_5a_5'a_4'a_3'a_2'a_1'a_1$ in G_1 induces in G a cycle of length $5 \cdot 20 + 4 \cdot 24 + 5m + 4n$. Each cycle of type $a_1a_2a_3a_4a_5a_5'a_4'a_3'a_2'a_1'a_1$ 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:

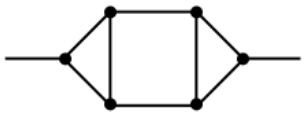

Fig. 4

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):

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

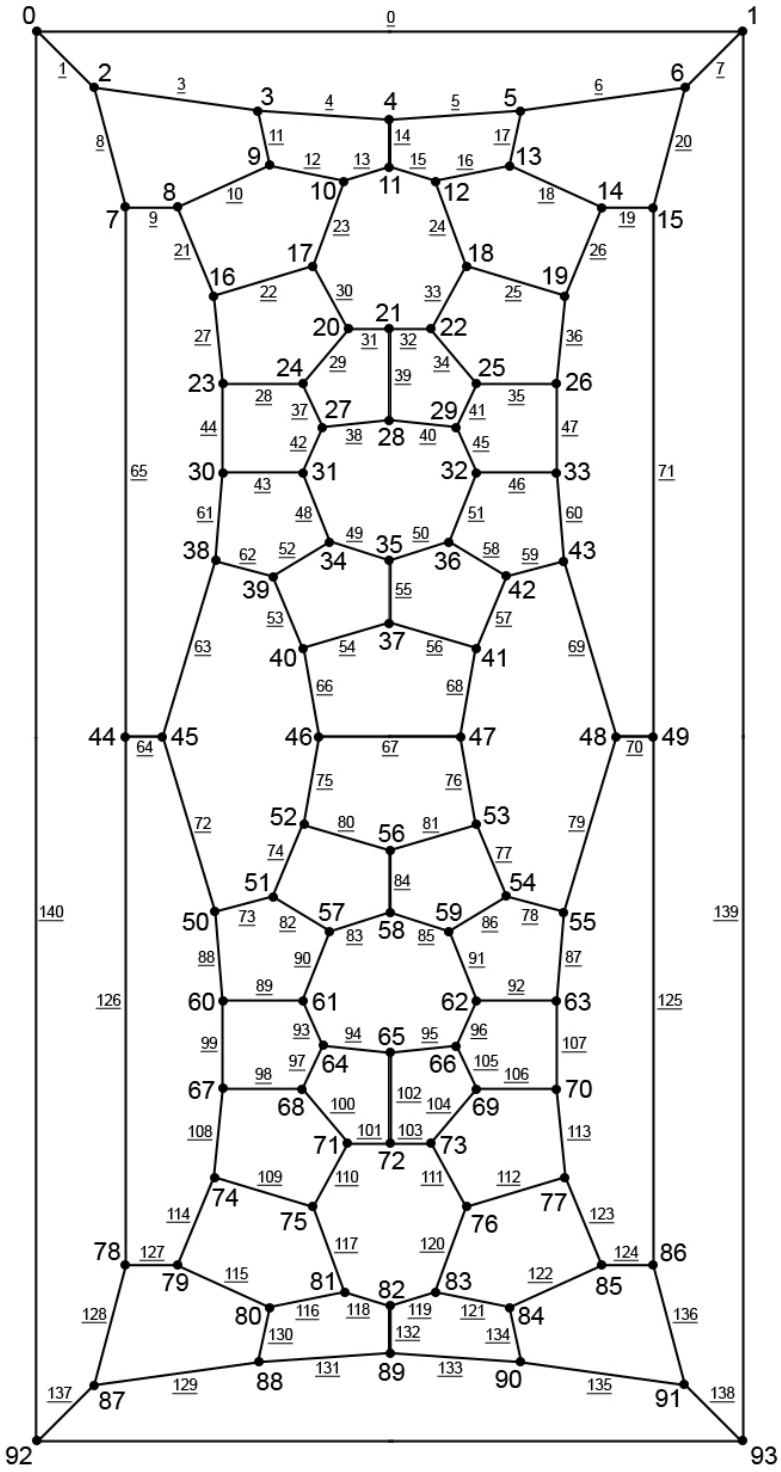
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93
0 1 2 3 4 5 6 7 8 9 10 11 12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

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

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

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

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

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

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

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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

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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

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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

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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

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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

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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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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

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

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

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

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

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	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
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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
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12	1	3	13	1	5	16	1	3	3	5	13	13	+	97	97	12	1	1
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17	5	2	6	3	5	21	21	2	3	2	11	2	3	15	2	5	40	+
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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