
City Assignments

Here are the city assignments of all CTSP cases.

eil21-2:

$$V_1 = \{1, 2, \dots, 5\}, V_2 = \{6, 7, \dots, 10\}, \text{ and } U = \{11, 12, \dots, 20\}$$

eil21-3:

$$V_1 = \{1, 2, 3, 4\}, V_2 = \{5, 6, 7, 8\}, V_3 = \{9, 10, 11, 12\}, \text{ and } U = \{13, 14, \dots, 20\}$$

eil31-2:

$$V_1 = \{1, 2, \dots, 6\}, V_2 = \{7, 8, \dots, 12\}, \text{ and } U = \{13, 14, \dots, 30\}$$

eil31-3:

$$V_1 = \{1, 2, \dots, 5\}, V_2 = \{6, 7, \dots, 10\}, V_3 = \{11, 12, \dots, 15\}, \text{ and } U = \{16, 17, \dots, 30\}$$

eil31-4:

$$V_1 = \{1, 2, 3, 4\}, V_2 = \{5, 6, 7, 8\}, V_3 = \{9, 10, 11, 12\}, V_4 = \{13, 14, 15, 16\}, \text{ and } U = \{17, 18, \dots, 30\}$$

eil41-2:

$$V_1 = \{1, 2, \dots, 10\}, V_2 = \{11, 12, \dots, 20\}, \text{ and } U = \{21, 22, \dots, 40\}$$

eil41-3:

$$V_1 = \{1, 2, \dots, 6\}, V_2 = \{7, 8, \dots, 12\}, V_3 = \{13, 14, \dots, 18\}, \text{ and } U = \{19, 20, \dots, 40\}$$

eil41-4:

$$V_1 = \{1, 2, \dots, 5\}, V_2 = \{6, 7, \dots, 10\}, V_3 = \{11, 12, \dots, 15\}, V_4 = \{16, 17, \dots, 20\}, \\ \text{and } U = \{21, 22, \dots, 40\}$$

eil51-2:

$$V_1 = \{1, 2, \dots, 15\}, V_2 = \{16, 17, \dots, 30\}, \text{ and } U = \{31, 32, \dots, 50\}$$

eil51-3:

$$V_1 = \{1, 2, \dots, 10\}, V_2 = \{11, 12, \dots, 20\}, V_3 = \{21, 22, \dots, 30\}, \text{ and } U = \{31, 32, \dots, 50\}$$

eil51-4:

$$V_1 = \{1, 2, \dots, 7\}, V_2 = \{8, 9, \dots, 14\}, V_3 = \{15, 16, \dots, 22\}, V_4 = \{23, 24, \dots, 30\}, \text{ and } U = \{31, 32, \dots, 50\}$$

eil51-5:

$$V_1 = \{1, 2, \dots, 6\}, V_2 = \{7, 8, \dots, 12\}, V_3 = \{13, 14, \dots, 18\}, V_4 = \{19, 20, \dots, 24\}, \\ V_5 = \{25, 26, \dots, 30\}, \text{ and } U = \{31, 32, \dots, 50\}$$

eil76-3:

$$V_1 = \{1, 2, \dots, 15\}, V_2 = \{16, 17, \dots, 30\}, V_3 = \{31, 32, \dots, 45\}, \text{ and } U = \{46, 47, \dots, 75\}$$

eil76-4:

$$V_1 = \{1, 2, \dots, 10\}, V_2 = \{11, 12, \dots, 20\}, V_3 = \{21, 22, \dots, 30\}, V_4 = \{31, 32, \dots, 40\},$$

and $U = \{41, 42, \dots, 75\}$

eil76-5:

$V_1 = \{1, 2, \dots, 10\}$, $V_2 = \{11, 12, \dots, 20\}$, $V_3 = \{21, 22, \dots, 30\}$, $V_4 = \{31, 32, \dots, 40\}$,
 $V_5 = \{41, 42, \dots, 50\}$, and $U = \{51, 52, \dots, 75\}$

eil76-6:

$V_1 = \{1, 2, \dots, 6\}$, $V_2 = \{7, 8, \dots, 12\}$, $V_3 = \{13, 14, \dots, 18\}$, $V_4 = \{19, 20, \dots, 24\}$,
 $V_5 = \{25, 26, \dots, 30\}$, $V_6 = \{31, 32, \dots, 36\}$, and $U = \{37, 38, \dots, 75\}$

eil101-4:

$V_1 = \{1, 2, \dots, 20\}$, $V_2 = \{21, 22, \dots, 40\}$, $V_3 = \{41, 42, \dots, 60\}$, $V_4 = \{61, 62, \dots, 80\}$,
and $U = \{81, 82, \dots, 100\}$

eil101-5:

$V_1 = \{1, 2, \dots, 10\}$, $V_2 = \{11, 12, \dots, 20\}$, $V_3 = \{21, 22, \dots, 28\}$, $V_4 = \{29, 30, \dots, 38\}$,
 $V_5 = \{39, 40, \dots, 48\}$, and $U = \{49, 50, \dots, 100\}$

eil101-6:

$V_1 = \{1, 2, \dots, 10\}$, $V_2 = \{11, 12, \dots, 20\}$, $V_3 = \{21, 22, \dots, 30\}$, $V_4 = \{31, 32, \dots, 40\}$,
 $V_5 = \{41, 42, \dots, 50\}$, $V_6 = \{51, 52, \dots, 60\}$, and $U = \{61, 62, \dots, 100\}$

eil101-7:

$V_1 = \{1, 2, \dots, 10\}$, $V_2 = \{11, 12, \dots, 20\}$, $V_3 = \{21, 22, \dots, 30\}$, $V_4 = \{31, 32, \dots, 40\}$,
 $V_5 = \{41, 42, \dots, 50\}$, $V_6 = \{51, 52, \dots, 60\}$, $V_7 = \{61, 62, \dots, 70\}$, and
 $U = \{71, 72, \dots, 100\}$

Coordinate Data of Cities

Notes:

1. City 0 is the depot in all cases.
2. The cases with the same city count but different salesman count have differently numbered cities due to some reasons.

eil20-2

City #: (X, Y)

0 42 41

1 32 22

2 30 40

3 25 32

4 27 23

5 31 32

6 58 48

7 49 49

8 52 33

9 52 41

10 51 31

11 40 30

12 37 52

13 42 50

14 37 48

15 38 46

16 38 28

17 48 28

18 45 35

19 43 25

20 38 35

eil20-3

City #: (X, Y)

0 42 41

1 32 22

2 31 32

3 25 32

4 27 23

5 51 31

6 52 41

7 48 28

8 52 33

9 38 46

10 37 52

11 37 48

12 42 50

13 30 40

14 58 48

15 40 30

16 38 28

17 49 49

18 45 35

19 43 25

20 38 35

eil30-2

City #: (X, Y)

0 42 41

1 5 25

2 16 57

3 7 38

4 17 33

5 12 42

6 8 52

7 58 27

8 57 58

9 62 42

10 58 48

11 61 33

12 56 37

13 20 26

14 42 57

15 25 55

16 40 30

17 37 52

18 52 41

19 31 32

20 49 49

21 38 46

22 25 32

23 45 35

24 51 31

25 21 47

26 30 48

27 30 40

28 48 28

29 52 33

30 32 39

eil30-3

0 42 41
1 5 25
2 20 26
3 7 38
4 17 33
5 12 42
6 52 33
7 58 27
8 48 28
9 61 33
10 51 31
11 16 57
12 57 58
13 8 52
14 42 57
15 25 55
16 40 30
17 37 52
18 52 41
19 31 32
20 49 49
21 38 46
22 25 32
23 45 35
24 62 42
25 21 47
26 30 48
27 30 40
28 56 37
29 58 48
30 32 39

eil30-4

0 42 41
1 5 25
2 20 26
3 7 38
4 17 33
5 61 33
6 51 31
7 58 27
8 48 28
9 57 58
10 58 48
11 49 49
12 42 57
13 8 52
14 21 47
15 25 55
16 16 57
17 37 52
18 52 41
19 31 32
20 62 42
21 38 46
22 25 32
23 45 35
24 12 42
25 40 30
26 30 48
27 30 40
28 56 37
29 52 33
30 32 39

eil40-2

City #: (X, Y)

0 42 41
1 5 25
2 17 63
3 20 26
4 17 33
5 12 42
6 5 64
7 7 38
8 21 47
9 8 52
10 16 57
11 61 33
12 52 64
13 56 37
14 58 27
15 62 42
16 57 58
17 49 49
18 58 48
19 52 41
20 62 63
21 37 69
22 31 62
23 32 39
24 25 55
25 52 33
26 27 23
27 48 28
28 42 57
29 51 31
30 30 48
31 30 40
32 27 68
33 37 52
34 43 67
35 31 32
36 32 22
37 38 46
38 40 30
39 25 32
40 45 35

eil40-3

0 42 41
1 5 25
2 32 22
3 20 26
4 17 33
5 27 23
6 7 38
7 62 42
8 58 27
9 58 48
10 56 37
11 61 33
12 52 41
13 17 63
14 52 64
15 37 69
16 5 64
17 27 68
18 43 67
19 8 52
20 62 63
21 49 49
22 31 62
23 32 39
24 25 55
25 52 33
26 21 47
27 48 28
28 42 57
29 51 31
30 30 48
31 30 40
32 12 42
33 37 52
34 16 57
35 31 32
36 57 58
37 38 46
38 40 30
39 25 32
40 45 35

eil40-4

0 42 41
1 5 25
2 32 22
3 20 26
4 17 33
5 27 23
6 62 42
7 58 27
8 58 48
9 56 37
10 61 33
11 62 63
12 52 64
13 43 67
14 37 69
15 57 58
16 17 63
17 5 64
18 16 57
19 27 68
20 8 52
21 7 38
22 31 62
23 32 39
24 25 55
25 52 33
26 12 42
27 48 28
28 42 57
29 51 31
30 30 48
31 30 40
32 21 47
33 37 52
34 49 49
35 31 32
36 52 41
37 38 46
38 40 30
39 25 32
40 45 35

eil51-3

City #: (X, Y)

0 42 41
1 5 25
2 10 17
3 20 26
4 17 33
5 13 13
6 21 10
7 5 6
8 7 38
9 12 42
10 8 52
11 61 33
12 46 10
13 56 37
14 58 27
15 59 15
16 62 42
17 52 33
18 51 31
19 48 28
20 39 10
21 37 69
22 52 64
23 62 63
24 31 62
25 5 64
26 17 63
27 63 69
28 27 68
29 43 67
30 57 58
31 40 30
32 49 49
33 37 52
34 52 41
35 31 32
36 58 48
37 38 46
38 36 16
39 25 32
40 45 35
41 32 22
42 21 47
43 42 57
44 30 48
45 30 15
46 30 40
47 25 55
48 16 57
49 27 23

eil51-4
0 42 41
1 5 25
2 10 17
3 20 26
4 17 33
5 13 13
6 21 10
7 5 6
8 59 15
9 62 42
10 39 10
11 61 33
12 46 10
13 56 37
14 58 27
15 43 67
16 57 58
17 63 69
18 27 68
19 31 62
20 62 63
21 37 69
22 52 64
23 7 38
24 25 55
25 5 64
26 17 63
27 8 52
28 21 47
29 12 42
30 16 57
31 40 30
32 49 49
33 37 52
34 52 41
35 31 32
36 58 48
37 38 46
38 36 16
39 25 32
40 45 35
41 32 22
42 51 31
43 42 57
44 30 48
45 30 15
46 30 40
47 48 28
48 52 33
49 27 23
50 32 39

eil51-5

0	42	41
1	5	25
2	10	17
3	30	15
4	5	6
5	13	13
6	21	10
7	58	27
8	59	15
9	36	16
10	39	10
11	61	33
12	46	10
13	62	42
14	52	64
15	62	63
16	57	58
17	63	69
18	58	48
19	31	62
20	42	57
21	37	69
22	27	68
23	43	67
24	25	55
25	5	64
26	17	63
27	8	52
28	7	38
29	12	42
30	16	57
31	40	30
32	49	49
33	37	52
34	52	41
35	31	32
36	17	33
37	38	46
38	56	37
39	25	32
40	45	35
41	32	22
42	51	31
43	21	47
44	30	48
45	20	26
46	30	40
47	48	28
48	52	33
49	27	23
50	32	39

eil76-3

City #: (X, Y)

0 33 34
1 22 22
2 15 14
3 11 28
4 26 13
5 12 17
6 16 19
7 20 30
8 6 25
9 15 5
10 21 36
11 36 6
12 7 43
13 12 38
14 21 45
15 21 48
16 64 4
17 66 8
18 55 20
19 60 15
20 65 27
21 62 57
22 50 4
23 62 24
24 50 15
25 67 41
26 54 10
27 62 48
28 66 14
29 62 35
30 59 5
31 15 56
32 57 72
33 35 60
34 9 56
35 26 59
36 47 66
37 10 70
38 17 64
39 70 64
40 55 65
41 30 60
42 50 70
43 40 66
44 40 60
45 31 76
46 33 44
47 55 57
48 35 51
49 30 50

50 22 53
51 44 13
52 52 26
53 36 26
54 29 39
55 27 24
56 55 45
57 41 46
58 55 50
59 48 21
60 35 16
61 45 35
62 40 20
63 50 50
64 26 29
65 55 34
66 30 20
67 45 42
68 38 33
69 40 40
70 43 26
71 50 30
72 50 40
73 51 42
74 54 38
75 40 37

eil76-4

0 33 34
1 22 22
2 15 14
3 11 28
4 26 13
5 12 17
6 16 19
7 12 38
8 6 25
9 15 5
10 7 43
11 36 6
12 66 14
13 50 15
14 59 5
15 44 13
16 64 4
17 66 8
18 50 4
19 60 15
20 54 10
21 62 57
22 50 70
23 62 24
24 70 64
25 67 41
26 57 72
27 62 48
28 65 27
29 62 35
30 55 65
31 15 56
32 31 76
33 35 60
34 9 56
35 26 59
36 47 66
37 10 70
38 17 64
39 40 66
40 30 60
41 20 30
42 55 20
43 21 48
44 40 60
45 21 45
46 33 44
47 55 57
48 35 51
49 30 50
50 22 53

51 21 36
52 52 26
53 36 26
54 29 39
55 27 24
56 55 45
57 41 46
58 55 50
59 48 21
60 35 16
61 45 35
62 40 20
63 50 50
64 26 29
65 55 34
66 30 20
67 45 42
68 38 33
69 40 40
70 43 26
71 50 30
72 50 40
73 51 42
74 54 38
75 40 37

eil76-5
0 33 34
1 22 22
2 15 14
3 11 28
4 26 13
5 12 17
6 16 19
7 20 30
8 6 25
9 15 5
10 12 38
11 36 6
12 50 4
13 66 14
14 44 13
15 54 10
16 64 4
17 66 8
18 59 5
19 60 15
20 50 15
21 62 57
22 54 38
23 62 24
24 55 20
25 67 41
26 55 34
27 62 48
28 65 27
29 62 35
30 52 26
31 40 66
32 57 72
33 35 60
34 55 57
35 31 76
36 47 66
37 50 70
38 40 60
39 70 64
40 55 65
41 30 60
42 7 43
43 21 48
44 10 70
45 21 45
46 17 64
47 9 56
48 26 59
49 15 56
50 22 53
51 21 36

52 35 51
53 36 26
54 29 39
55 27 24
56 55 45
57 41 46
58 55 50
59 48 21
60 35 16
61 45 35
62 40 20
63 50 50
64 26 29
65 33 44
66 30 20
67 45 42
68 38 33
69 40 40
70 43 26
71 50 30
72 50 40
73 51 42
74 30 50
75 40 37

eil76-6
0 33 34
1 6 25
2 15 14
3 11 28
4 15 5
5 12 17
6 16 19
7 50 4
8 26 13
9 44 13
10 35 16
11 36 6
12 50 15
13 66 14
14 59 5
15 60 15
16 64 4
17 66 8
18 54 10
19 67 41
20 65 27
21 62 57
22 62 48
23 62 35
24 70 64
25 31 76
26 57 72
27 47 66
28 50 70
29 40 66
30 55 65
31 15 56
32 12 38
33 10 70
34 9 56
35 7 43
36 17 64
37 22 22
38 62 24
39 26 59
40 30 60
41 20 30
42 55 20
43 21 48
44 40 60
45 21 45
46 33 44
47 55 57
48 35 51
49 30 50
50 22 53
51 21 36

52 52 26
53 36 26
54 29 39
55 27 24
56 55 45
57 41 46
58 55 50
59 48 21
60 35 60
61 45 35
62 40 20
63 50 50
64 26 29
65 55 34
66 30 20
67 45 42
68 38 33
69 40 40
70 43 26
71 50 30
72 50 40
73 51 42
74 54 38
75 40 37

eil101-4

City #: (X, Y)

0 41 49
1 11 14
2 25 21
3 12 24
4 18 18
5 23 3
6 18 24
7 5 5
8 15 19
9 10 20
10 16 22
11 15 10
12 24 12
13 22 27
14 22 22
15 20 20
16 20 26
17 4 18
18 21 24
19 25 24
20 19 21
21 49 11
22 65 35
23 44 17
24 60 12
25 65 20
26 46 13
27 32 12
28 55 20
29 63 23
30 28 18
31 57 29
32 47 16
33 45 20
34 53 12
35 42 7
36 67 5
37 55 5
38 45 10
39 30 5
40 35 17
41 55 60
42 35 69
43 37 56
44 63 65
45 45 65
46 64 42
47 55 54
48 49 73
49 30 60

50 57 68
51 49 58
52 61 52
53 40 60
54 27 69
55 65 55
56 31 67
57 57 48
58 31 52
59 62 77
60 53 52
61 13 52
62 14 37
63 2 60
64 20 65
65 20 50
66 10 43
67 15 60
68 8 56
69 24 58
70 20 40
71 15 47
72 5 30
73 15 30
74 2 48
75 26 52
76 6 38
77 15 77
78 11 31
79 17 34
80 6 68
81 35 35
82 37 47
83 26 35
84 49 42
85 27 43
86 50 35
87 25 30
88 26 27
89 40 25
90 30 25
91 36 26
92 45 30
93 47 47
94 56 39
95 56 37
96 35 40
97 41 37
98 53 43
99 55 45
100 37 31

eil101-5
0 35 35
1 11 14
2 23 3
3 18 18
4 4 18
5 30 5
6 15 19
7 24 12
8 15 10
9 5 5
10 10 20
11 67 5
12 63 23
13 53 12
14 46 13
15 60 12
16 55 5
17 42 7
18 65 20
19 49 11
20 45 10
21 56 39
22 65 55
23 53 52
24 56 37
25 55 54
26 64 42
27 55 45
28 61 52
29 65 35
30 57 48
31 35 69
32 15 77
33 63 65
34 31 67
35 49 73
36 20 65
37 27 69
38 57 68
39 45 65
40 62 77
41 2 48
42 5 30
43 13 52
44 6 68
45 6 38
46 2 60
47 8 56
48 15 60
49 10 43
50 15 47
51 15 30

52 24 58
53 49 58
54 20 40
55 55 60
56 12 24
57 40 60
58 17 34
59 14 37
60 11 31
61 55 20
62 32 12
63 37 47
64 26 52
65 20 50
66 16 22
67 35 17
68 20 20
69 57 29
70 19 21
71 30 60
72 25 21
73 30 25
74 40 25
75 44 17
76 41 49
77 47 16
78 37 56
79 27 43
80 41 37
81 45 20
82 47 47
83 36 26
84 25 30
85 26 27
86 35 40
87 18 24
88 28 18
89 45 30
90 37 31
91 20 26
92 22 22
93 26 35
94 53 43
95 25 24
96 22 27
97 21 24
98 50 35
99 49 42
100 31 52

eil101-6
0 35 35
1 11 14
2 23 3
3 18 18
4 4 18
5 30 5
6 15 19
7 24 12
8 15 10
9 5 5
10 10 20
11 67 5
12 63 23
13 53 12
14 46 13
15 60 12
16 55 5
17 42 7
18 65 20
19 49 11
20 45 10
21 56 39
22 65 55
23 53 52
24 56 37
25 55 54
26 64 42
27 55 45
28 61 52
29 65 35
30 57 48
31 35 69
32 49 58
33 63 65
34 37 56
35 49 73
36 55 60
37 40 60
38 57 68
39 45 65
40 62 77
41 15 77
42 24 58
43 27 69
44 6 68
45 30 60
46 2 60
47 8 56
48 15 60
49 20 65
50 31 67
51 15 30

52 2 48
53 5 30
54 20 40
55 6 38
56 12 24
57 10 43
58 17 34
59 14 37
60 11 31
61 55 20
62 32 12
63 37 47
64 26 52
65 20 50
66 16 22
67 35 17
68 20 20
69 57 29
70 19 21
71 15 47
72 25 21
73 30 25
74 40 25
75 44 17
76 41 49
77 47 16
78 13 52
79 27 43
80 41 37
81 45 20
82 47 47
83 36 26
84 25 30
85 26 27
86 35 40
87 18 24
88 28 18
89 45 30
90 37 31
91 20 26
92 22 22
93 26 35
94 53 43
95 25 24
96 22 27
97 21 24
98 50 35
99 49 42
100 31 52

eil101-7
0 35 35
1 11 14
2 23 3
3 18 18
4 4 18
5 30 5
6 15 19
7 24 12
8 15 10
9 5 5
10 10 20
11 67 5
12 63 23
13 53 12
14 46 13
15 60 12
16 55 5
17 42 7
18 65 20
19 49 11
20 45 10
21 56 39
22 65 55
23 53 52
24 56 37
25 55 54
26 64 42
27 55 45
28 61 52
29 65 35
30 57 48
31 35 69
32 49 58
33 63 65
34 37 56
35 49 73
36 55 60
37 40 60
38 57 68
39 45 65
40 62 77
41 15 77
42 24 58
43 27 69
44 6 68
45 30 60
46 2 60
47 8 56
48 15 60
49 20 65
50 31 67
51 15 47

52 2 48
53 5 30
54 13 52
55 6 38
56 20 50
57 10 43
58 17 34
59 14 37
60 11 31
61 15 30
62 22 22
63 12 24
64 20 26
65 25 24
66 16 22
67 18 24
68 20 20
69 21 24
70 19 21
71 26 52
72 25 21
73 30 25
74 40 25
75 44 17
76 41 49
77 47 16
78 55 20
79 27 43
80 41 37
81 45 20
82 47 47
83 36 26
84 25 30
85 26 27
86 35 40
87 32 12
88 28 18
89 45 30
90 37 31
91 35 17
92 57 29
93 26 35
94 53 43
95 25 24
96 20 40
97 37 47
98 50 35
99 49 42
100 31 52