Problem 1:

Cycle Cancelling:

Initial:

From: -1 To: 0 Capacity: 4 Cost :0

From: 0 To: 1 Capacity: 4 Cost :2

From: 0 To: 2 Capacity: 2 Cost :2

From: 1 To: 2 Capacity: 2 Cost :1

From: 1 To: 3 Capacity: 3 Cost :3

From: 2 To: 3 Capacity: 5 Cost :1

From: 3 To: 4 Capacity: 4 Cost :0

Final Network:

From: -1 To: 0 flow: 4 Cost :0

From: 0 To: 1 flow: 2 Cost :2

From: 0 To: 2 flow: 2 Cost :2

From: 1 To: 2 flow: 2 Cost :1

From: 1 To: 3 flow: 0 Cost :3

From: 2 To: 3 flow: 4 Cost :1

From: 3 To: 4 flow: 4 Cost :0

n: 6 m: 7 Time taken: 0.43s

Successive Shortest Path:

Initial:

From: 0 To: 1 Capacity: 4 Cost :2

From: 0 To: 2 Capacity: 2 Cost :2

From: 1 To: 2 Capacity: 2 Cost :1

From: 1 To: 3 Capacity: 3 Cost :3

From: 2 To: 3 Capacity: 5 Cost :1

Final Network:

From: 0 To: 1 flow: 2 Cost :2

From: 0 To: 2 flow: 2 Cost :2

From: 1 To: 2 flow: 2 Cost :1

From: 1 To: 3 flow: 0 Cost :3

From: 2 To: 3 flow: 4 Cost :1

n: 4 m: 5 Time taken: 0.07s

Problem 2:

Cycle Cancelling:

From: -1 To: 0 Capacity: 5 Cost :0

From: -1 To: 1 Capacity: 3 Cost :0

From: 0 To: 1 Capacity: 10 Cost :4

From: 0 To: 2 Capacity: 6 Cost :3

From: 1 To: 2 Capacity: 3 Cost :4

From: 1 To: 3 Capacity: 1 Cost :2

From: 1 To: 4 Capacity: 7 Cost :5

From: 2 To: 3 Capacity: 6 Cost :1

From: 2 To: 4 Capacity: 5 Cost :1

From: 3 To: 4 Capacity: 3 Cost :1

From: 3 To: 5 Capacity: 1 Cost :1

From: 4 To: 5 Capacity: 8 Cost :2

From: 4 To: 6 Capacity: 2 Cost :0

From: 5 To: 6 Capacity: 6 Cost :0

Final Network:

From: -1 To: 0 flow: 5 Cost :0

From: -1 To: 1 flow: 3 Cost :0

From: 0 To: 1 flow: 0 Cost :4

From: 0 To: 2 flow: 5 Cost :3

From: 1 To: 2 flow: 0 Cost :4

From: 1 To: 3 flow: 1 Cost :2

From: 1 To: 4 flow: 2 Cost :5

From: 2 To: 3 flow: 0 Cost :1

From: 2 To: 4 flow: 5 Cost :1

From: 3 To: 4 flow: 0 Cost :1

From: 3 To: 5 flow: 1 Cost :1

From: 4 To: 5 flow: 5 Cost :2

From: 4 To: 6 flow: 2 Cost :0

From: 5 To: 6 flow: 6 Cost :0

n: 8 m: 14 Time taken: 0.56s

Successive Shortest Path:

Initial:

From: 0 To: 1 Capacity: 10 Cost :4

From: 0 To: 2 Capacity: 6 Cost :3

From: 1 To: 2 Capacity: 3 Cost :4

From: 1 To: 3 Capacity: 1 Cost :2

From: 1 To: 4 Capacity: 7 Cost :5

From: 2 To: 3 Capacity: 6 Cost :1

From: 2 To: 4 Capacity: 5 Cost :1

From: 3 To: 4 Capacity: 3 Cost :1

From: 3 To: 5 Capacity: 1 Cost :1

From: 4 To: 5 Capacity: 8 Cost :2

Final Network:

From: 0 To: 1 flow: 0 Cost :4

From: 0 To: 2 flow: 5 Cost :3

From: 1 To: 2 flow: 0 Cost :4

From: 1 To: 3 flow: 1 Cost :2

From: 1 To: 4 flow: 2 Cost :5

From: 2 To: 3 flow: 0 Cost :1

From: 2 To: 4 flow: 5 Cost :1

From: 3 To: 4 flow: 0 Cost :1

From: 3 To: 5 flow: 1 Cost :1

From: 4 To: 5 flow: 5 Cost :2

n: 6 m: 10 Time taken: 0.25s

Problem 3:

Cycle Cancelling:

Initial:

From: 1 To: 12 Capacity: 10 Cost :0

From: 1 To: 8 Capacity: 20 Cost :0

From: 2 To: 8 Capacity: 5 Cost :0

From: 2 To: 9 Capacity: 15 Cost :0

From: 2 To: 20 Capacity: 5 Cost :0

From: 3 To: 15 Capacity: 8 Cost :0

From: 4 To: 10 Capacity: 12 Cost :0

From: 6 To: 17 Capacity: 10 Cost :0

From: 6 To: 13 Capacity: 20 Cost :0

From: 7 To: 13 Capacity: 5 Cost :0

From: 7 To: 14 Capacity: 15 Cost :0

From: 7 To: 25 Capacity: 5 Cost :0

From: 8 To: 20 Capacity: 8 Cost :0

From: 9 To: 15 Capacity: 12 Cost :0

From: 11 To: 22 Capacity: 10 Cost :0

From: 11 To: 18 Capacity: 20 Cost :0

From: 12 To: 18 Capacity: 5 Cost :0

From: 12 To: 19 Capacity: 15 Cost :0

From: 12 To: 30 Capacity: 5 Cost :0

From: 13 To: 25 Capacity: 8 Cost :0

From: 14 To: 20 Capacity: 12 Cost :0

From: 16 To: 27 Capacity: 10 Cost :0

From: 16 To: 23 Capacity: 20 Cost :0

From: 17 To: 23 Capacity: 5 Cost :0

From: 17 To: 24 Capacity: 15 Cost :0

From: 17 To: 35 Capacity: 5 Cost :0

From: 18 To: 30 Capacity: 8 Cost :0

From: 19 To: 25 Capacity: 12 Cost :0

From: 21 To: 32 Capacity: 10 Cost :0

From: 21 To: 28 Capacity: 20 Cost :0

From: 22 To: 28 Capacity: 5 Cost :0

From: 22 To: 29 Capacity: 15 Cost :0

From: 22 To: 40 Capacity: 5 Cost :0

From: 23 To: 35 Capacity: 8 Cost :0

From: 24 To: 30 Capacity: 12 Cost :0

From: 26 To: 37 Capacity: 10 Cost :0

From: 26 To: 33 Capacity: 20 Cost :0

From: 27 To: 33 Capacity: 5 Cost :0

From: 27 To: 34 Capacity: 15 Cost :0

From: 27 To: 45 Capacity: 5 Cost :0

From: 28 To: 40 Capacity: 8 Cost :0

From: 29 To: 35 Capacity: 12 Cost :0

From: 0 To: 1 Capacity: 10000 Cost :0

From: 0 To: 6 Capacity: 10000 Cost :0

From: 0 To: 11 Capacity: 10000 Cost :0

From: 0 To: 16 Capacity: 10000 Cost :0

From: 0 To: 21 Capacity: 10000 Cost :0

From: 0 To: 26 Capacity: 10000 Cost :0

From: 5 To: 46 Capacity: 10000 Cost :5

From: 10 To: 46 Capacity: 10000 Cost :10

From: 15 To: 46 Capacity: 10000 Cost :20

From: 20 To: 46 Capacity: 10000 Cost :40

From: 25 To: 46 Capacity: 10000 Cost :80

From: 30 To: 46 Capacity: 10000 Cost :160

From: -1 To: 0 Capacity: 40 Cost :0

From: 46 To: 47 Capacity: 40 Cost :0

Final Network:

From: 1 To: 12 flow: 10 Cost :0

From: 1 To: 8 flow: 8 Cost :0

From: 2 To: 8 flow: 0 Cost :0

From: 2 To: 9 flow: 0 Cost :0

From: 2 To: 20 flow: 0 Cost :0

From: 3 To: 15 flow: 0 Cost :0

From: 4 To: 10 flow: 0 Cost :0

From: 6 To: 17 flow: 6 Cost :0

From: 6 To: 13 flow: 8 Cost :0

From: 7 To: 13 flow: 0 Cost :0

From: 7 To: 14 flow: 0 Cost :0

From: 7 To: 25 flow: 0 Cost :0

From: 8 To: 20 flow: 8 Cost :0

From: 9 To: 15 flow: 0 Cost :0

From: 11 To: 22 flow: 0 Cost :0

From: 11 To: 18 flow: 8 Cost :0

From: 12 To: 18 flow: 0 Cost :0

From: 12 To: 19 flow: 10 Cost :0

From: 12 To: 30 flow: 0 Cost :0

From: 13 To: 25 flow: 8 Cost :0

From: 14 To: 20 flow: 0 Cost :0

From: 16 To: 27 flow: 0 Cost :0

From: 16 To: 23 flow: 0 Cost :0

From: 17 To: 23 flow: 0 Cost :0

From: 17 To: 24 flow: 6 Cost :0

From: 17 To: 35 flow: 0 Cost :0

From: 18 To: 30 flow: 8 Cost :0

From: 19 To: 25 flow: 10 Cost :0

From: 21 To: 32 flow: 0 Cost :0

From: 21 To: 28 flow: 0 Cost :0

From: 22 To: 28 flow: 0 Cost :0

From: 22 To: 29 flow: 0 Cost :0

From: 22 To: 40 flow: 0 Cost :0

From: 23 To: 35 flow: 0 Cost :0

From: 24 To: 30 flow: 6 Cost :0

From: 26 To: 37 flow: 0 Cost :0

From: 26 To: 33 flow: 0 Cost :0

From: 27 To: 33 flow: 0 Cost :0

From: 27 To: 34 flow: 0 Cost :0

From: 27 To: 45 flow: 0 Cost :0

From: 28 To: 40 flow: 0 Cost :0

From: 29 To: 35 flow: 0 Cost :0

From: 0 To: 1 flow: 18 Cost :0

From: 0 To: 6 flow: 14 Cost :0

From: 0 To: 11 flow: 8 Cost :0

From: 0 To: 16 flow: 0 Cost :0

From: 0 To: 21 flow: 0 Cost :0

From: 0 To: 26 flow: 0 Cost :0

From: 5 To: 46 flow: 0 Cost :5

From: 10 To: 46 flow: 0 Cost :10

From: 15 To: 46 flow: 0 Cost :20

From: 20 To: 46 flow: 8 Cost :40

From: 25 To: 46 flow: 18 Cost :80

From: 30 To: 46 flow: 14 Cost :160

From: -1 To: 0 flow: 40 Cost :0

From: 46 To: 47 flow: 40 Cost :0

n: 49 m: 56 Time taken: 3.31s

Successive Shortest Path:

Initial:

From: 1 To: 12 Capacity: 10 Cost :0

From: 1 To: 8 Capacity: 20 Cost :0

From: 2 To: 8 Capacity: 5 Cost :0

From: 2 To: 9 Capacity: 15 Cost :0

From: 2 To: 20 Capacity: 5 Cost :0

From: 3 To: 15 Capacity: 8 Cost :0

From: 4 To: 10 Capacity: 12 Cost :0

From: 6 To: 17 Capacity: 10 Cost :0

From: 6 To: 13 Capacity: 20 Cost :0

From: 7 To: 13 Capacity: 5 Cost :0

From: 7 To: 14 Capacity: 15 Cost :0

From: 7 To: 25 Capacity: 5 Cost :0

From: 8 To: 20 Capacity: 8 Cost :0

From: 9 To: 15 Capacity: 12 Cost :0

From: 11 To: 22 Capacity: 10 Cost :0

From: 11 To: 18 Capacity: 20 Cost :0

From: 12 To: 18 Capacity: 5 Cost :0

From: 12 To: 19 Capacity: 15 Cost :0

From: 12 To: 30 Capacity: 5 Cost :0

From: 13 To: 25 Capacity: 8 Cost :0

From: 14 To: 20 Capacity: 12 Cost :0

From: 16 To: 27 Capacity: 10 Cost :0

From: 16 To: 23 Capacity: 20 Cost :0

From: 17 To: 23 Capacity: 5 Cost :0

From: 17 To: 24 Capacity: 15 Cost :0

From: 17 To: 35 Capacity: 5 Cost :0

From: 18 To: 30 Capacity: 8 Cost :0

From: 19 To: 25 Capacity: 12 Cost :0

From: 21 To: 32 Capacity: 10 Cost :0

From: 21 To: 28 Capacity: 20 Cost :0

From: 22 To: 28 Capacity: 5 Cost :0

From: 22 To: 29 Capacity: 15 Cost :0

From: 22 To: 40 Capacity: 5 Cost :0

From: 23 To: 35 Capacity: 8 Cost :0

From: 24 To: 30 Capacity: 12 Cost :0

From: 26 To: 37 Capacity: 10 Cost :0

From: 26 To: 33 Capacity: 20 Cost :0

From: 27 To: 33 Capacity: 5 Cost :0

From: 27 To: 34 Capacity: 15 Cost :0

From: 27 To: 45 Capacity: 5 Cost :0

From: 28 To: 40 Capacity: 8 Cost :0

From: 29 To: 35 Capacity: 12 Cost :0

From: 0 To: 1 Capacity: 10000 Cost :0

From: 0 To: 6 Capacity: 10000 Cost :0

From: 0 To: 11 Capacity: 10000 Cost :0

From: 0 To: 16 Capacity: 10000 Cost :0

From: 0 To: 21 Capacity: 10000 Cost :0

From: 0 To: 26 Capacity: 10000 Cost :0

From: 5 To: 46 Capacity: 10000 Cost :5

From: 10 To: 46 Capacity: 10000 Cost :10

From: 15 To: 46 Capacity: 10000 Cost :20

From: 20 To: 46 Capacity: 10000 Cost :40

From: 25 To: 46 Capacity: 10000 Cost :80

From: 30 To: 46 Capacity: 10000 Cost :160

Final Network:

From: 1 To: 12 flow: 10 Cost :0

From: 1 To: 8 flow: 8 Cost :0

From: 2 To: 8 flow: 0 Cost :0

From: 2 To: 9 flow: 0 Cost :0

From: 2 To: 20 flow: 0 Cost :0

From: 3 To: 15 flow: 0 Cost :0

From: 4 To: 10 flow: 0 Cost :0

From: 6 To: 17 flow: 6 Cost :0

From: 6 To: 13 flow: 8 Cost :0

From: 7 To: 13 flow: 0 Cost :0

From: 7 To: 14 flow: 0 Cost :0

From: 7 To: 25 flow: 0 Cost :0

From: 8 To: 20 flow: 8 Cost :0

From: 9 To: 15 flow: 0 Cost :0

From: 11 To: 22 flow: 0 Cost :0

From: 11 To: 18 flow: 8 Cost :0

From: 12 To: 18 flow: 0 Cost :0

From: 12 To: 19 flow: 10 Cost :0

From: 12 To: 30 flow: 0 Cost :0

From: 13 To: 25 flow: 8 Cost :0

From: 14 To: 20 flow: 0 Cost :0

From: 16 To: 27 flow: 0 Cost :0

From: 16 To: 23 flow: 0 Cost :0

From: 17 To: 23 flow: 0 Cost :0

From: 17 To: 24 flow: 6 Cost :0

From: 17 To: 35 flow: 0 Cost :0

From: 18 To: 30 flow: 8 Cost :0

From: 19 To: 25 flow: 10 Cost :0

From: 21 To: 32 flow: 0 Cost :0

From: 21 To: 28 flow: 0 Cost :0

From: 22 To: 28 flow: 0 Cost :0

From: 22 To: 29 flow: 0 Cost :0

From: 22 To: 40 flow: 0 Cost :0

From: 23 To: 35 flow: 0 Cost :0

From: 24 To: 30 flow: 6 Cost :0

From: 26 To: 37 flow: 0 Cost :0

From: 26 To: 33 flow: 0 Cost :0

From: 27 To: 33 flow: 0 Cost :0

From: 27 To: 34 flow: 0 Cost :0

From: 27 To: 45 flow: 0 Cost :0

From: 28 To: 40 flow: 0 Cost :0

From: 29 To: 35 flow: 0 Cost :0

From: 0 To: 1 flow: 18 Cost :0

From: 0 To: 6 flow: 14 Cost :0

From: 0 To: 11 flow: 8 Cost :0

From: 0 To: 16 flow: 0 Cost :0

From: 0 To: 21 flow: 0 Cost :0

From: 0 To: 26 flow: 0 Cost :0

From: 5 To: 46 flow: 0 Cost :5

From: 10 To: 46 flow: 0 Cost :10

From: 15 To: 46 flow: 0 Cost :20

From: 20 To: 46 flow: 8 Cost :40

From: 25 To: 46 flow: 18 Cost :80

From: 30 To: 46 flow: 14 Cost :160

n: 47 m: 54 Time taken: 1.37s