Dijkstra's Shortest Path Algorithm
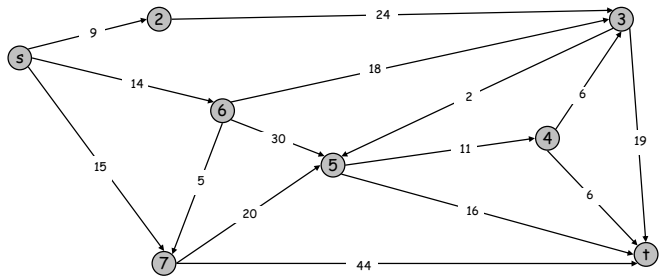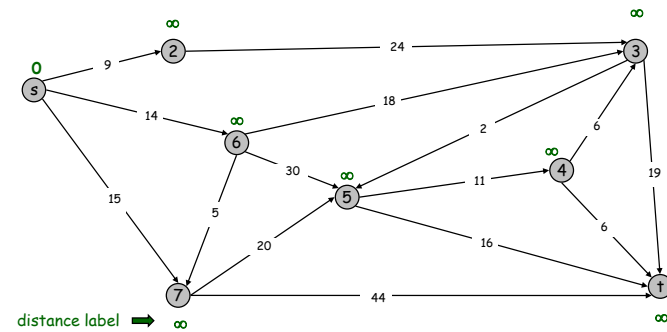
Find shortest path from s to t.
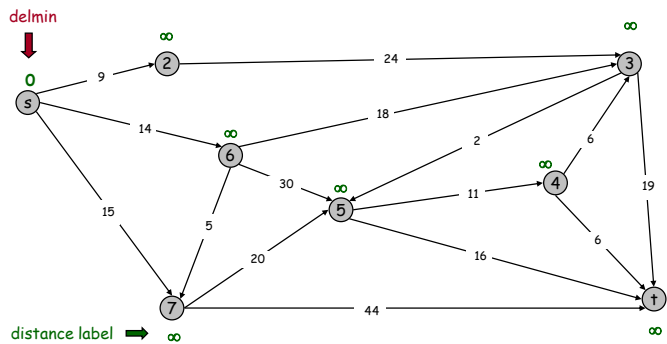

1

Dijkstra's Shortest Path Algorithm

S = { }
PQ = { s, 2, 3, 4, 5, 6, 7, t }

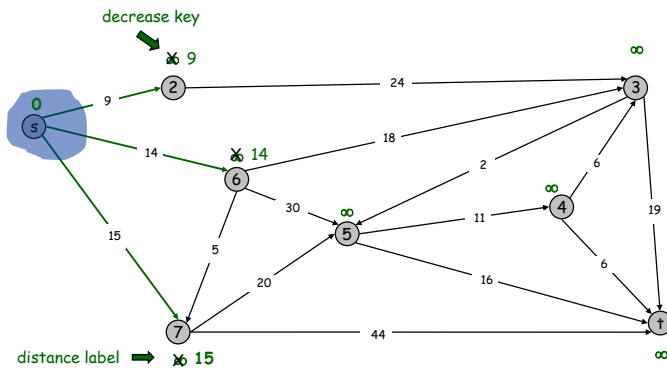distance label ➡

2

Dijkstra's Shortest Path Algorithm

S = { }
PQ = { s, 2, 3, 4, 5, 6, 7, t }

delmin

distance label ➡

3

Dijkstra's Shortest Path Algorithm

S = { s }
PQ = { 2, 3, 4, 5, 6, 7, t }

decrease key

distance label ➡

4

1

Dijkstra's Shortest Path Algorithm

S = { s }
PQ = { 2, 3, 4, 5, 6, 7, t }

delmin

distance label

5

Dijkstra's Shortest Path Algorithm

S = { s, 2 }
PQ = { 3, 4, 5, 6, 7, t }

6

Dijkstra's Shortest Path Algorithm

S = { s, 2 }
PQ = { 3, 4, 5, 6, 7, t }

decrease key

7

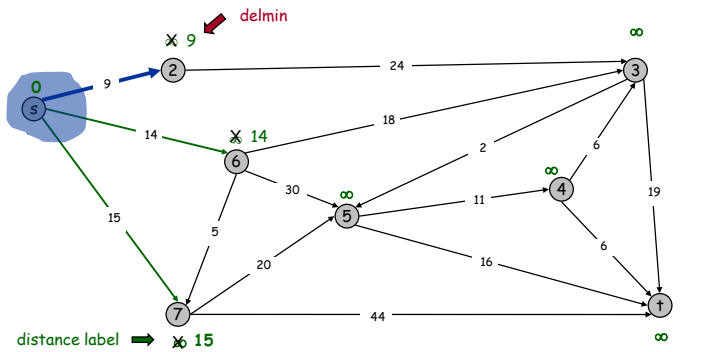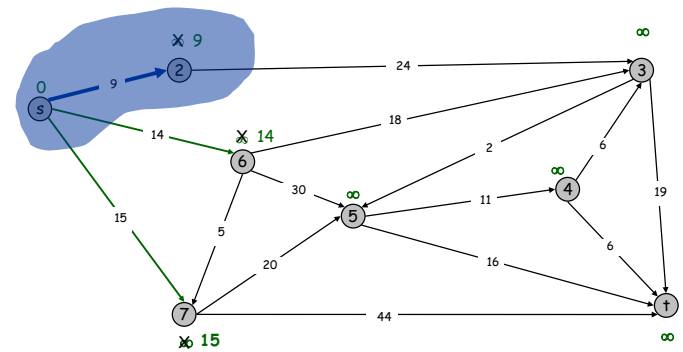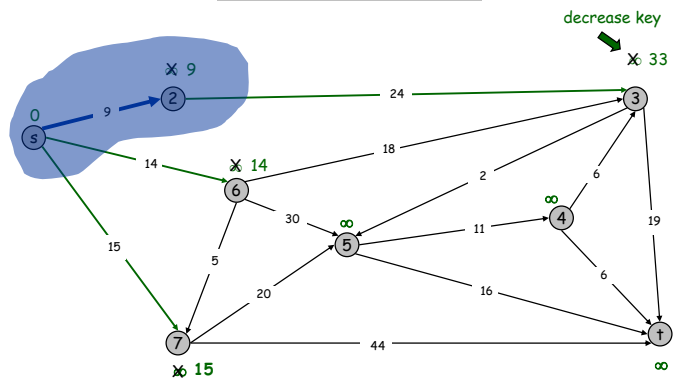### Dijkstra's Shortest Path Algorithm

S = { s, 2 }
PQ = { 3, 4, 5, 6, 7, t }

delmin

8

Dijkstra's Shortest Path Algorithm

S = { s, 2, 6 }
PQ = { 3, 4, 5, 7, t }
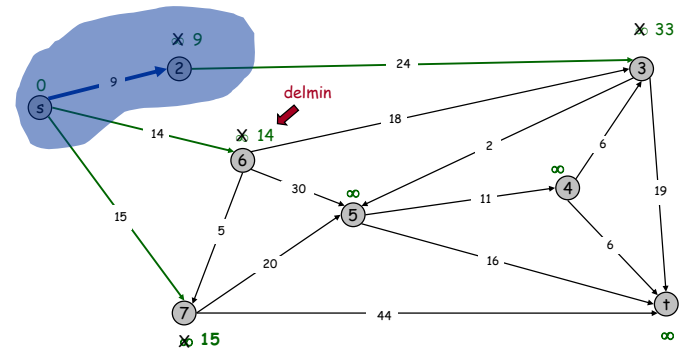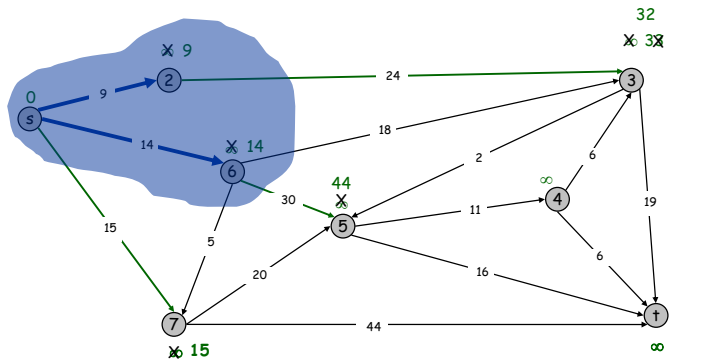
Dijkstra's Shortest Path Algorithm

S = { s, 2, 6 }
PQ = { 3, 4, 5, 7, t }

Dijkstra's Shortest Path Algorithm

S = { s, 2, 6, 7 }
PQ = { 3, 4, 5, t }

Dijkstra's Shortest Path Algorithm
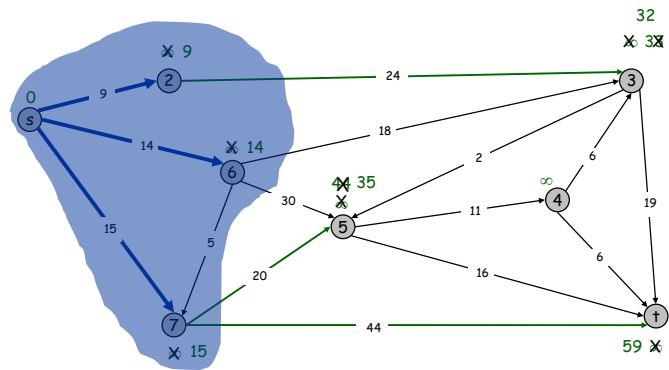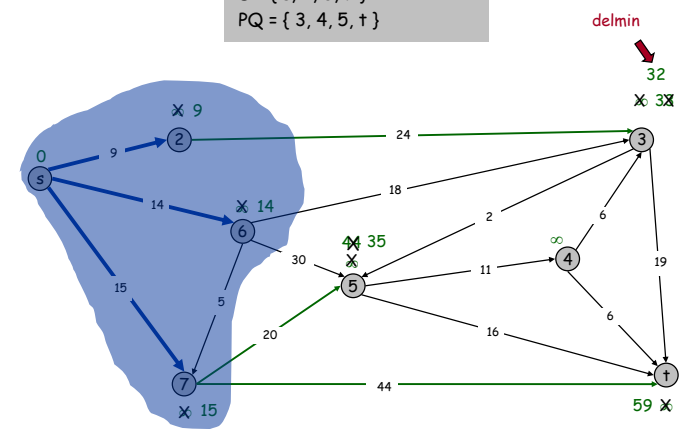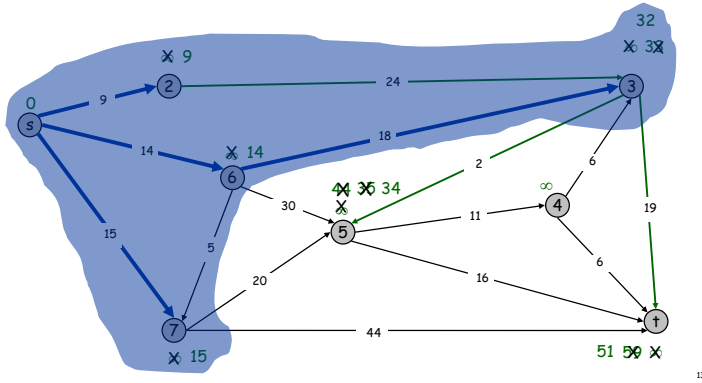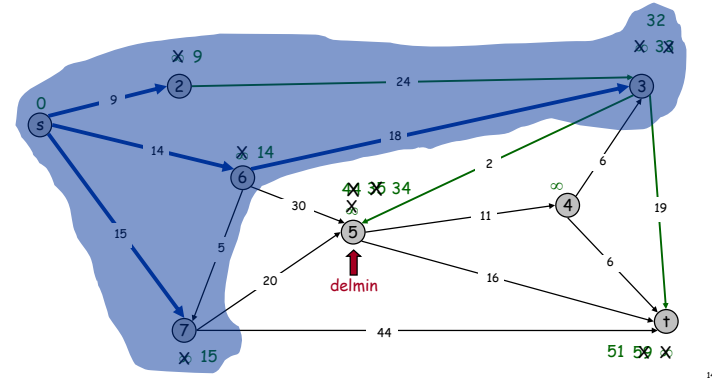
S = { s, 2, 6, 7 }
PQ = { 3, 4, 5, t }

Dijkstra's Shortest Path Algorithm

S = { s, 2, 3, 6, 7 }
PQ = { 4, 5, t }

Dijkstra's Shortest Path Algorithm

S = { s, 2, 3, 6, 7 }
PQ = { 4, 5, t }
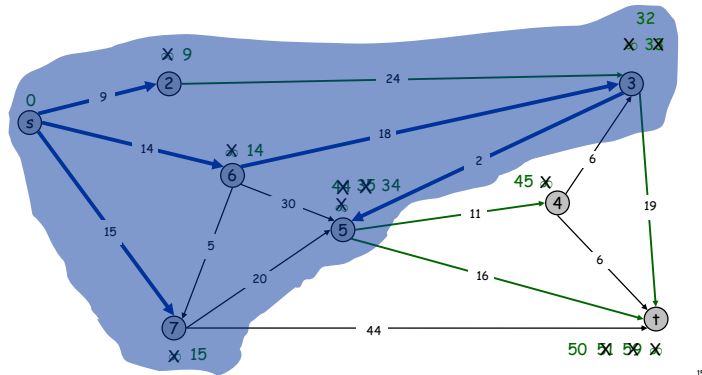
Dijkstra's Shortest Path Algorithm

S = { s, 2, 3, 5, 6, 7 }
PQ = { 4, t }

Dijkstra's Shortest Path Algorithm

S = { s, 2, 3, 5, 6, 7 }
PQ = { 4, t }

Dijkstra's Shortest Path Algorithm

S = { s, 2, 3, 4, 5, 6, 7 }
PQ = { t }

32
X 3X
X 9
2   24   3
0   9
s   18
14   6
6   2
X 14   45 X
30   4
X4 X5 34
X   11
5   19
15   5
20   16   6
7   t
44
X 15   50 5X 5X9 X

17

Dijkstra's Shortest Path Algorithm

S = { s, 2, 3, 4, 5, 6, 7 }
PQ = { t }

32
X 3X
X 9
2   24   3
0   9
s   18
14   6
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X 14   45 X
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44
delmin ➡ 50 5X 5X9 X
X 15

18

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19

Dijkstra's Shortest Path Algorithm

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X 15   50 5X 5X9 X

20