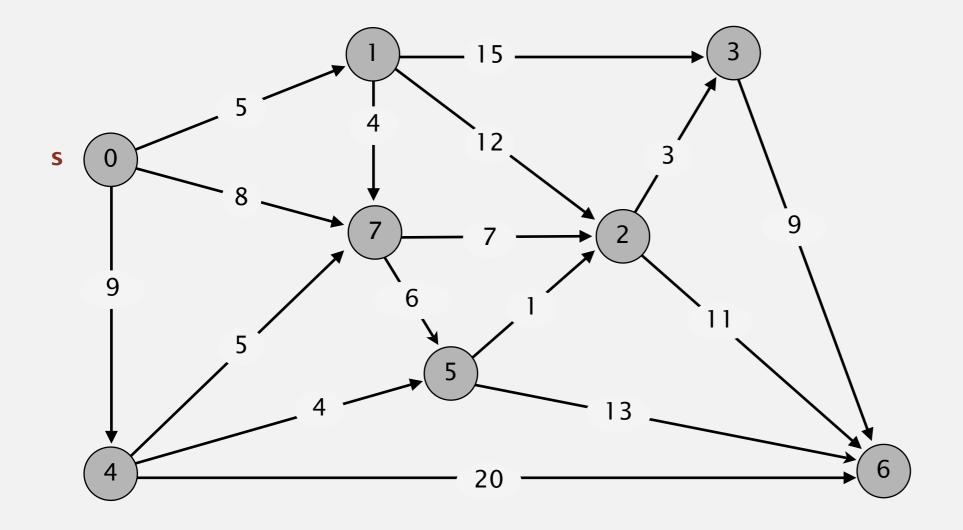
# Algorithms



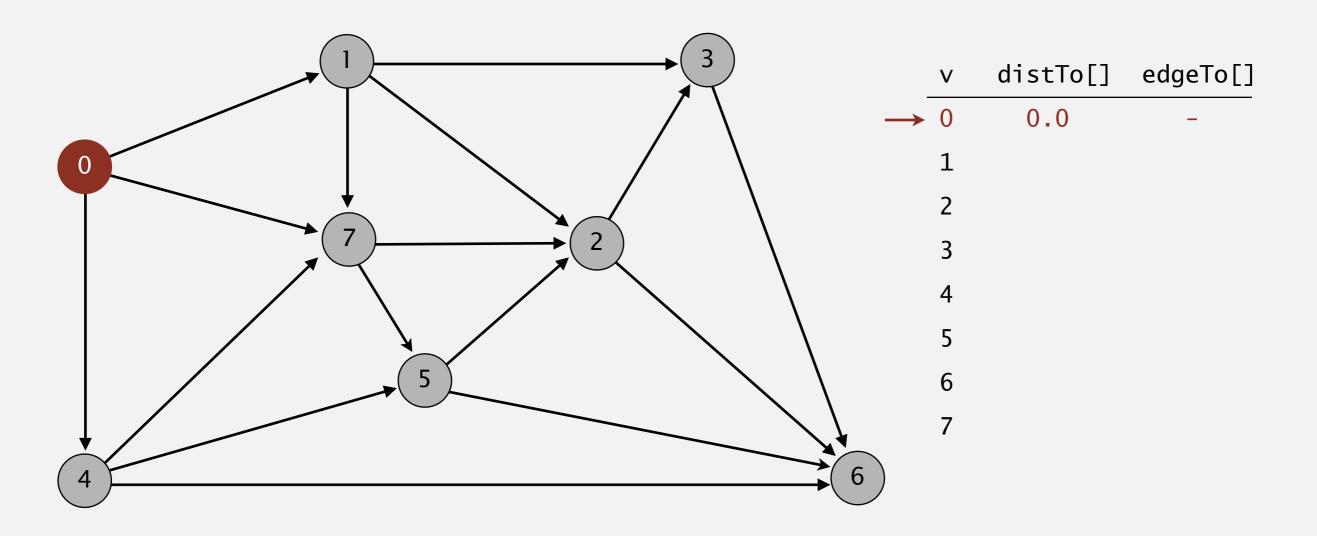
- Consider vertices in increasing order of distance from s
  (non-tree vertex with the lowest distTo[] value).
- Add vertex to tree and relax all edges pointing from that vertex.



an edge-weighted digraph

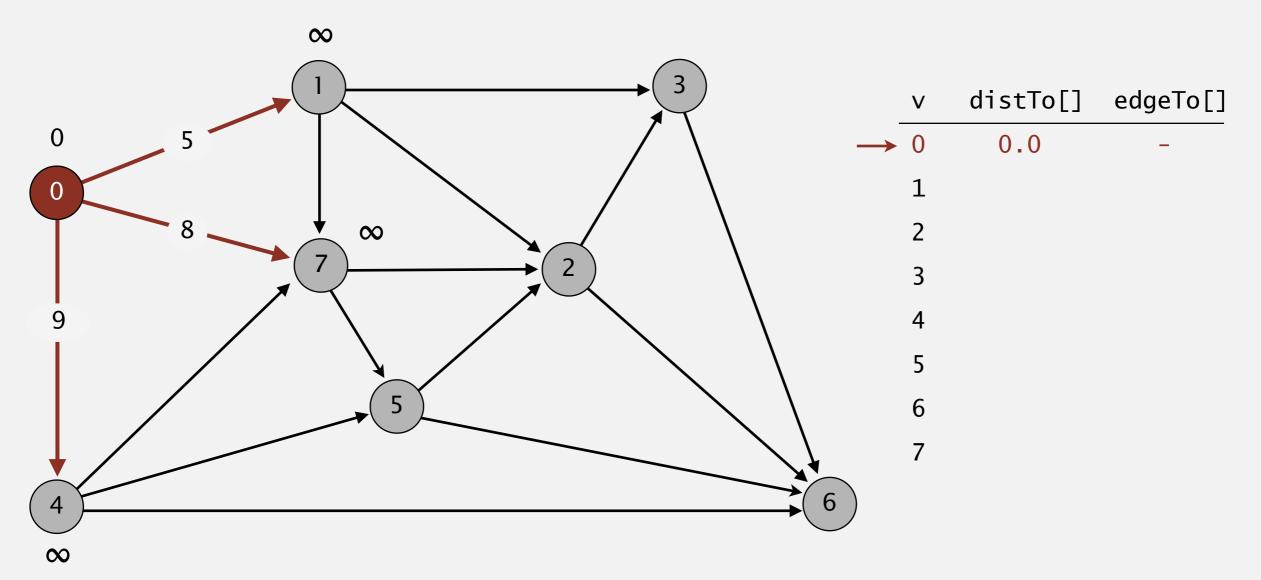
0→1	5.0
0→4	9.0
0→7	8.0
1→2	12.0
1→3	15.0
1→7	4.0
2→3	3.0
2→6	11.0
3→6	9.0
4→5	4.0
4→6	20.0
4→7	5.0
5→2	1.0
5→6	13.0
7→5	6.0
7→2	7.0

- Consider vertices in increasing order of distance from s
  (non-tree vertex with the lowest distTo[] value).
- Add vertex to tree and relax all edges pointing from that vertex.



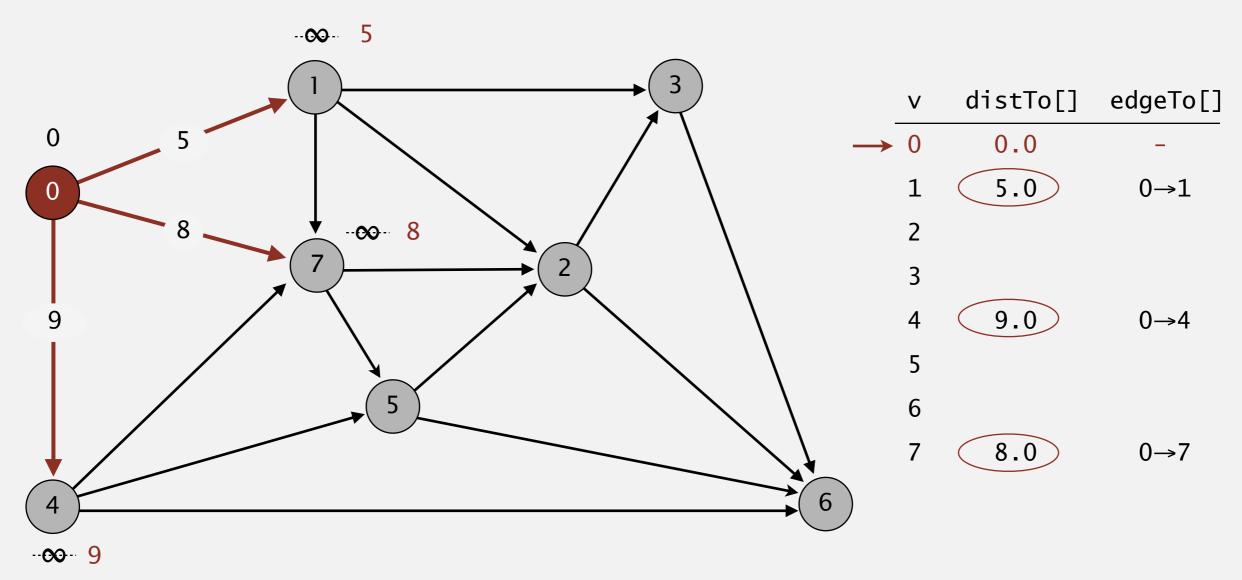
choose source vertex 0

- Consider vertices in increasing order of distance from s
  (non-tree vertex with the lowest distTo[] value).
- Add vertex to tree and relax all edges pointing from that vertex.



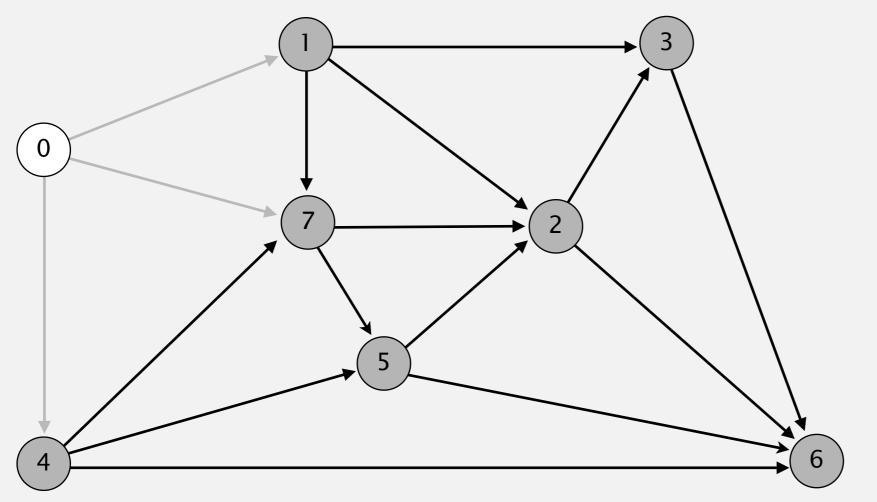
relax all edges pointing from 0

- Consider vertices in increasing order of distance from s
  (non-tree vertex with the lowest distTo[] value).
- Add vertex to tree and relax all edges pointing from that vertex.



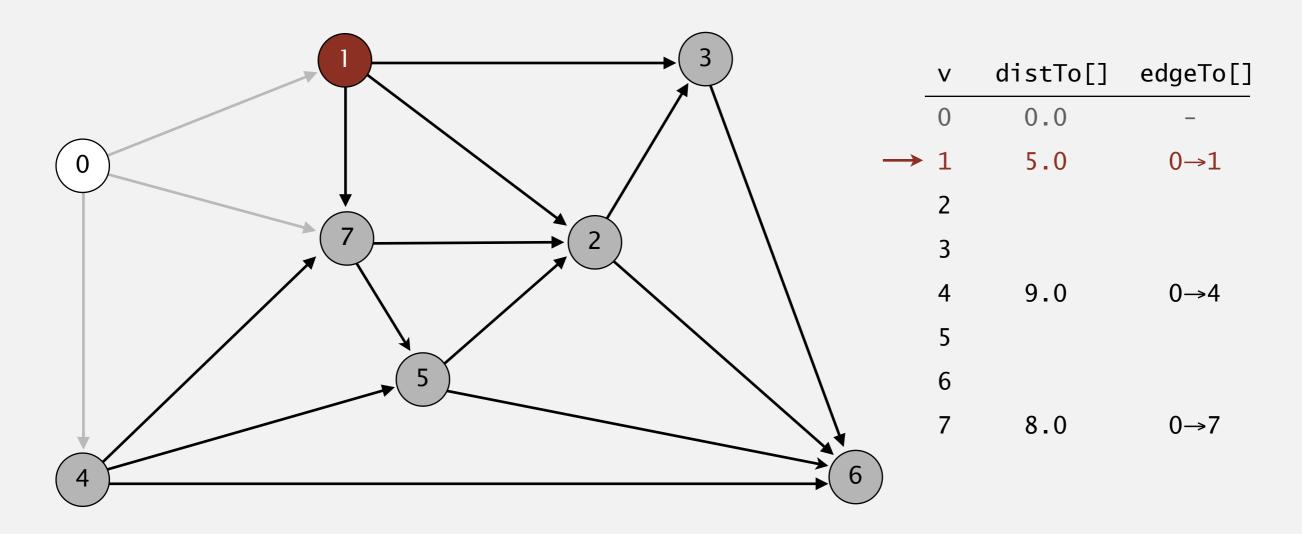
relax all edges pointing from 0

- Consider vertices in increasing order of distance from s
  (non-tree vertex with the lowest distTo[] value).
- Add vertex to tree and relax all edges pointing from that vertex.



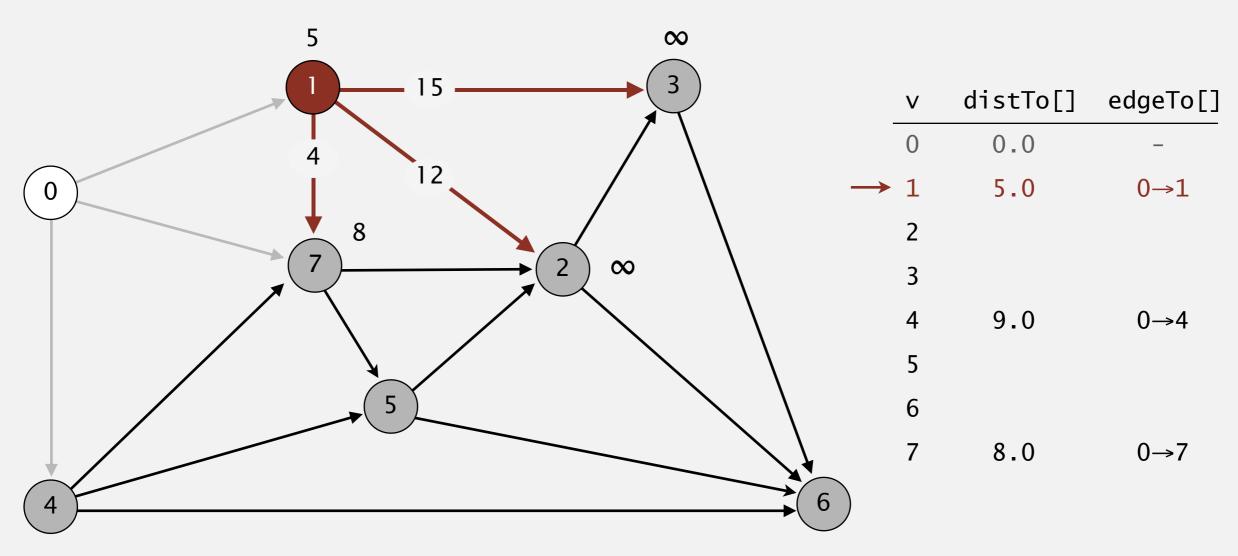
V	distTo[]	edgeTo[]
0	0.0	_
1	5.0	0→1
2		
3		
4	9.0	0→4
5		
6		
7	8.0	0→7

- Consider vertices in increasing order of distance from s
  (non-tree vertex with the lowest distTo[] value).
- Add vertex to tree and relax all edges pointing from that vertex.



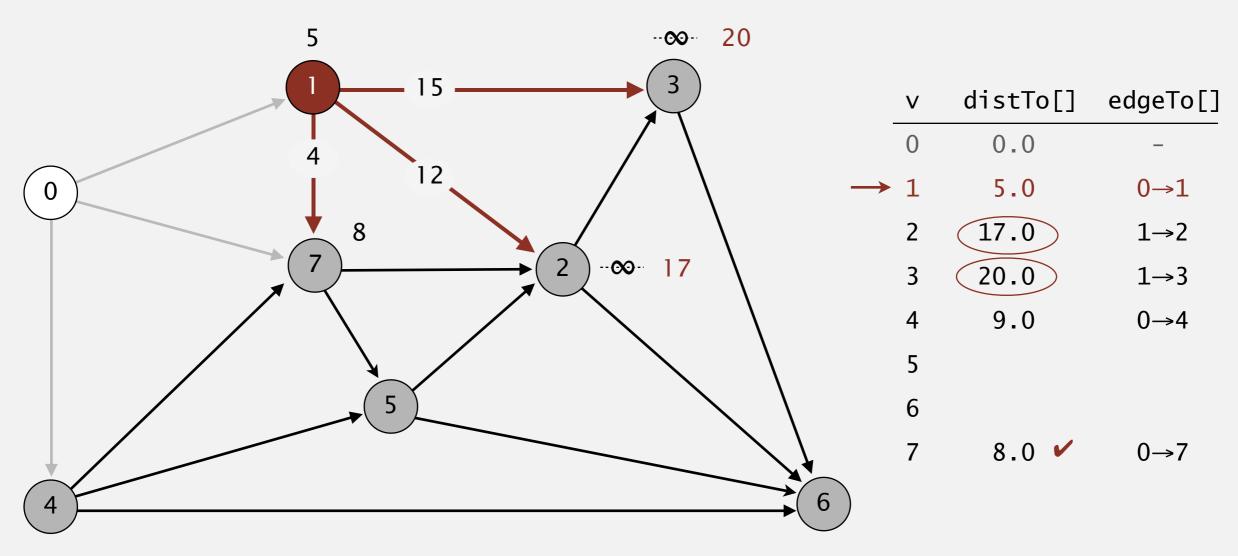
choose vertex 1

- Consider vertices in increasing order of distance from s
  (non-tree vertex with the lowest distTo[] value).
- Add vertex to tree and relax all edges pointing from that vertex.



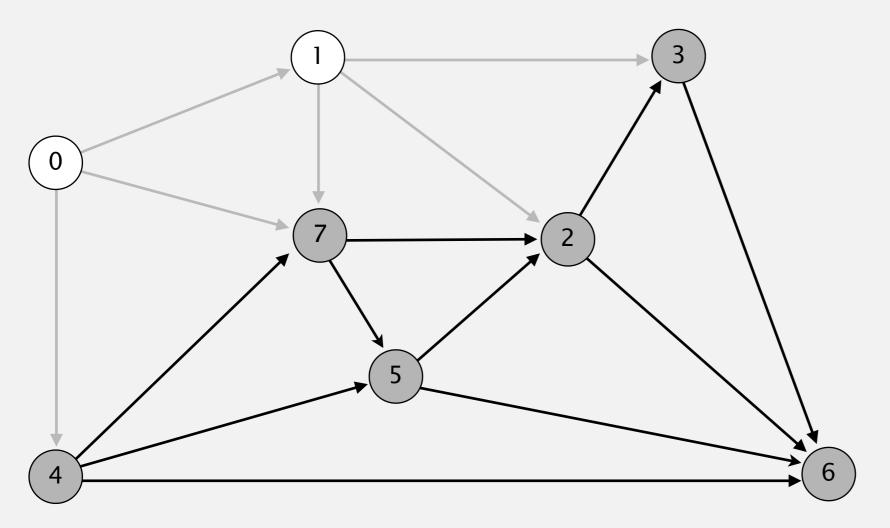
relax all edges pointing from 1

- Consider vertices in increasing order of distance from s
  (non-tree vertex with the lowest distTo[] value).
- Add vertex to tree and relax all edges pointing from that vertex.



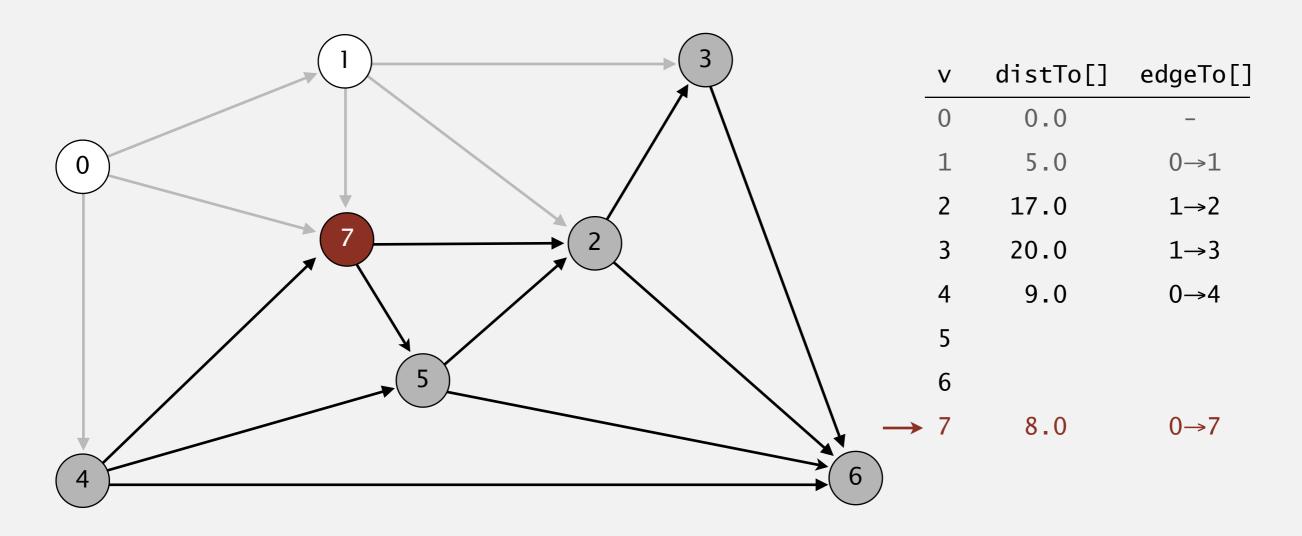
relax all edges pointing from 1

- Consider vertices in increasing order of distance from s
  (non-tree vertex with the lowest distTo[] value).
- Add vertex to tree and relax all edges pointing from that vertex.



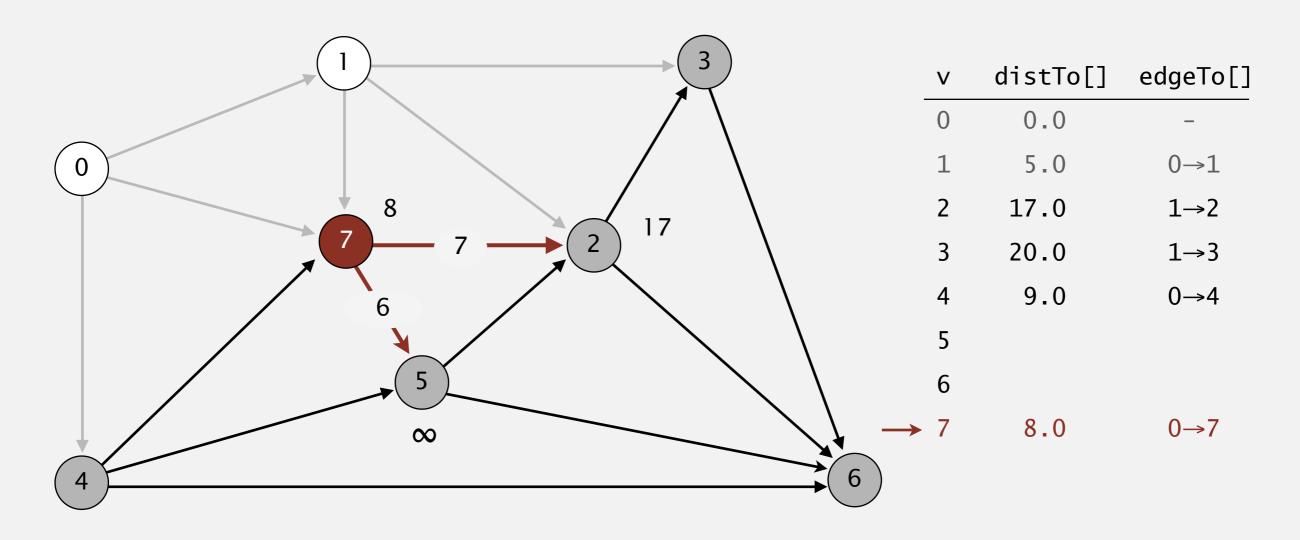
V	distTo[]	edgeTo[]
0	0.0	-
1	5.0	0→1
2	17.0	1→2
3	20.0	1→3
4	9.0	0→4
5		
6		
7	8.0	0→7

- Consider vertices in increasing order of distance from s
  (non-tree vertex with the lowest distTo[] value).
- Add vertex to tree and relax all edges pointing from that vertex.



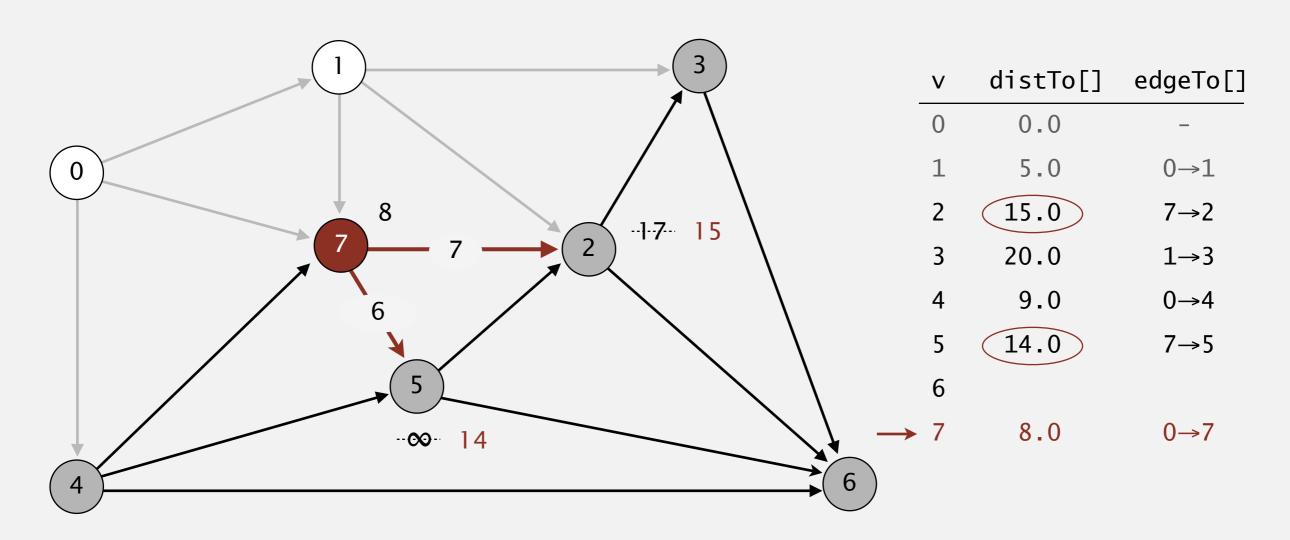
choose vertex 7

- Consider vertices in increasing order of distance from s
  (non-tree vertex with the lowest distTo[] value).
- Add vertex to tree and relax all edges pointing from that vertex.



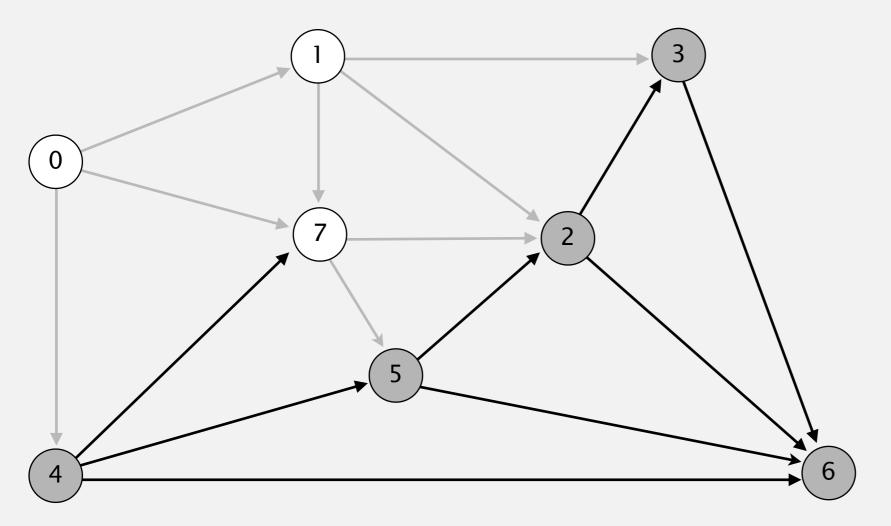
relax all edges pointing from 7

- Consider vertices in increasing order of distance from s
  (non-tree vertex with the lowest distTo[] value).
- Add vertex to tree and relax all edges pointing from that vertex.



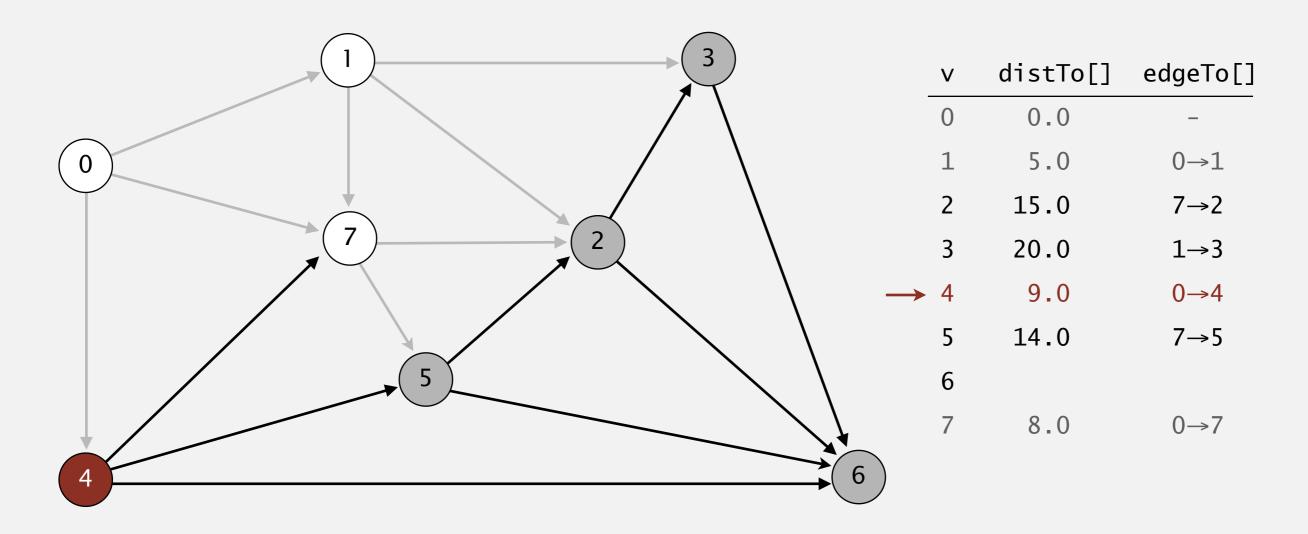
relax all edges pointing from 7

- Consider vertices in increasing order of distance from s
  (non-tree vertex with the lowest distTo[] value).
- Add vertex to tree and relax all edges pointing from that vertex.



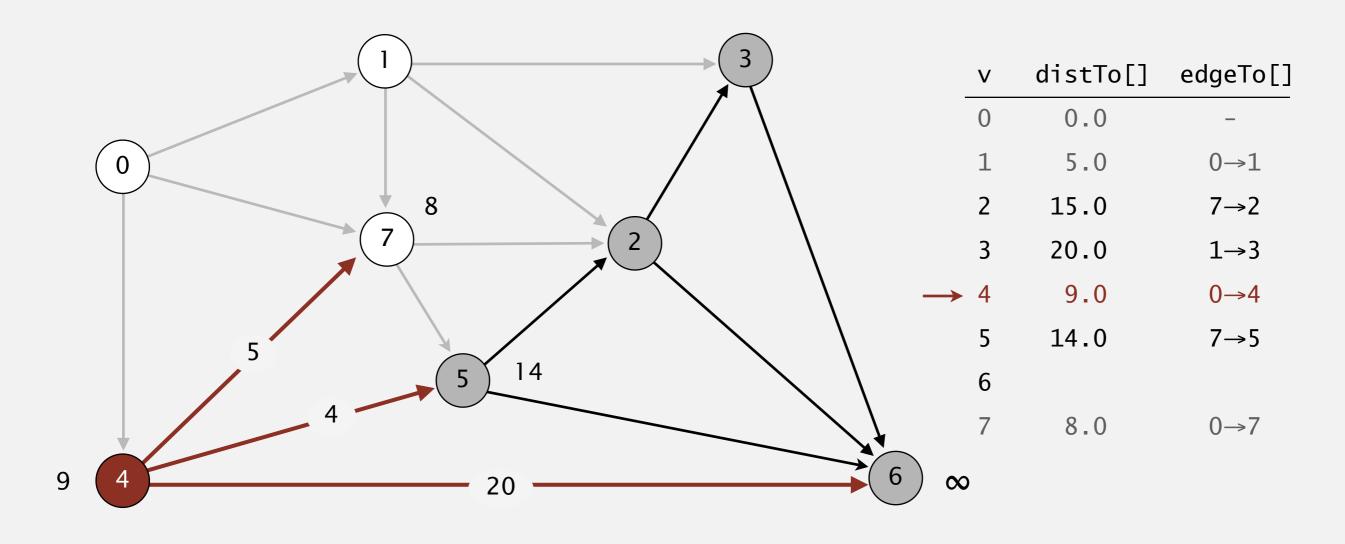
V	distTo[]	edgeTo[]
0	0.0	-
1	5.0	0→1
2	15.0	7→2
3	20.0	1→3
4	9.0	0→4
5	14.0	7→5
6		
7	8.0	0→7

- Consider vertices in increasing order of distance from s
  (non-tree vertex with the lowest distTo[] value).
- Add vertex to tree and relax all edges pointing from that vertex.



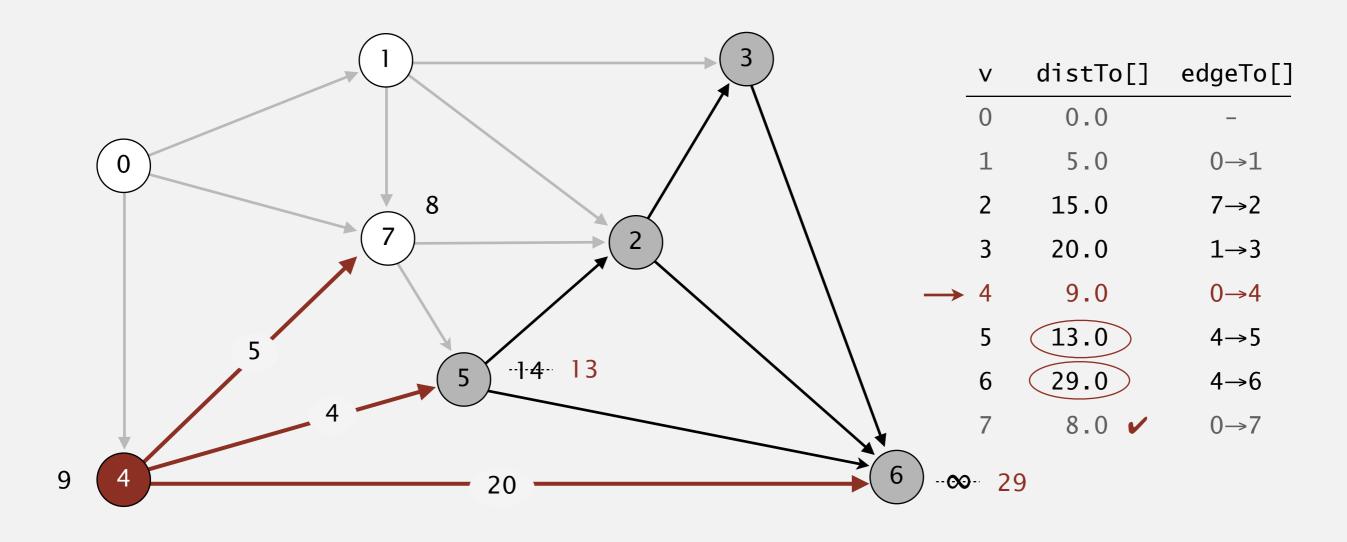
select vertex 4

- Consider vertices in increasing order of distance from s
  (non-tree vertex with the lowest distTo[] value).
- Add vertex to tree and relax all edges pointing from that vertex.



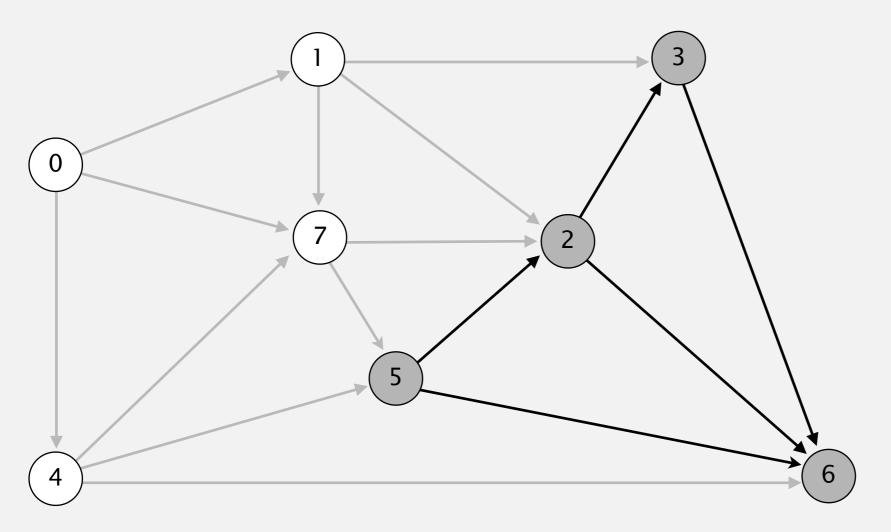
relax all edges pointing from 4

- Consider vertices in increasing order of distance from s
  (non-tree vertex with the lowest distTo[] value).
- Add vertex to tree and relax all edges pointing from that vertex.



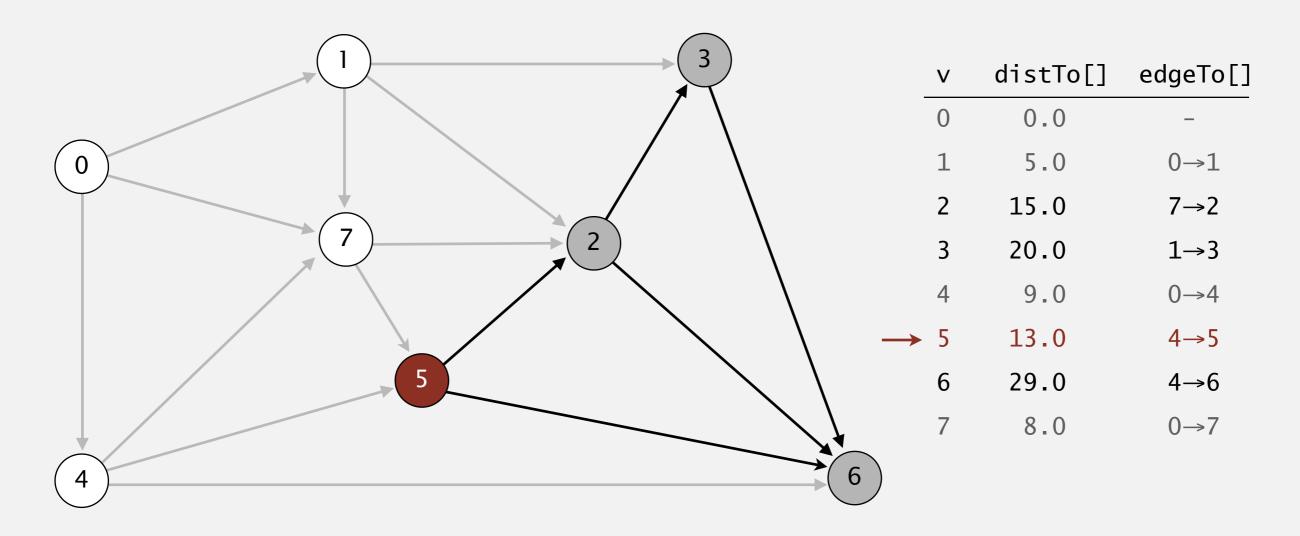
relax all edges pointing from 4

- Consider vertices in increasing order of distance from s
  (non-tree vertex with the lowest distTo[] value).
- Add vertex to tree and relax all edges pointing from that vertex.



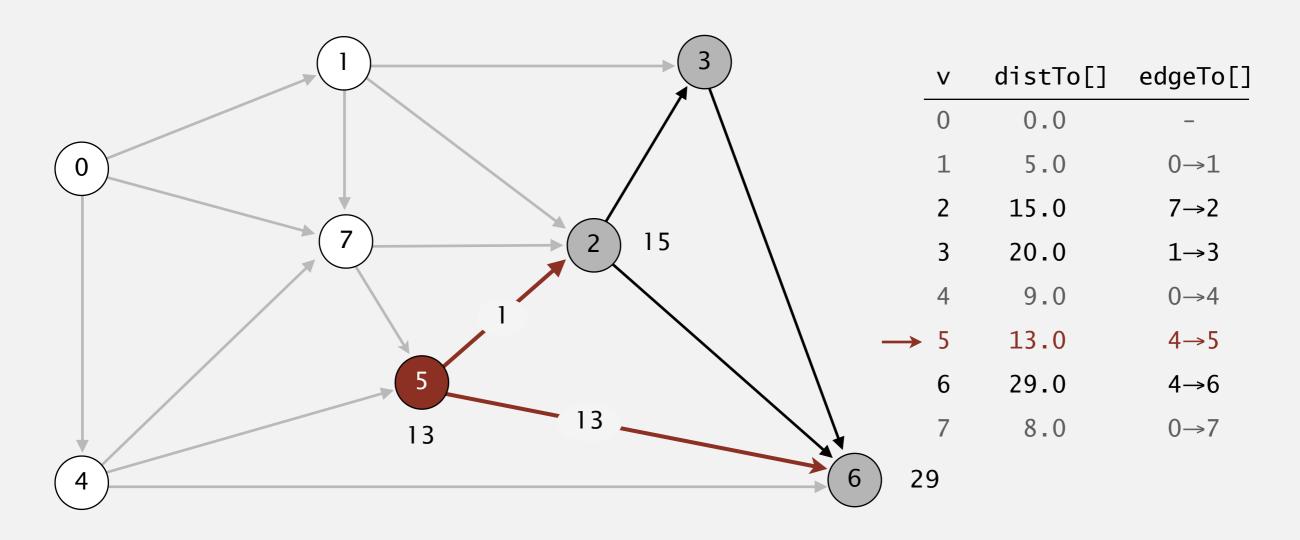
V	distTo[]	edgeTo[]
0	0.0	-
1	5.0	0→1
2	15.0	7→2
3	20.0	1→3
4	9.0	0→4
5	13.0	4→5
6	29.0	4→6
7	8.0	0→7

- Consider vertices in increasing order of distance from s
  (non-tree vertex with the lowest distTo[] value).
- Add vertex to tree and relax all edges pointing from that vertex.



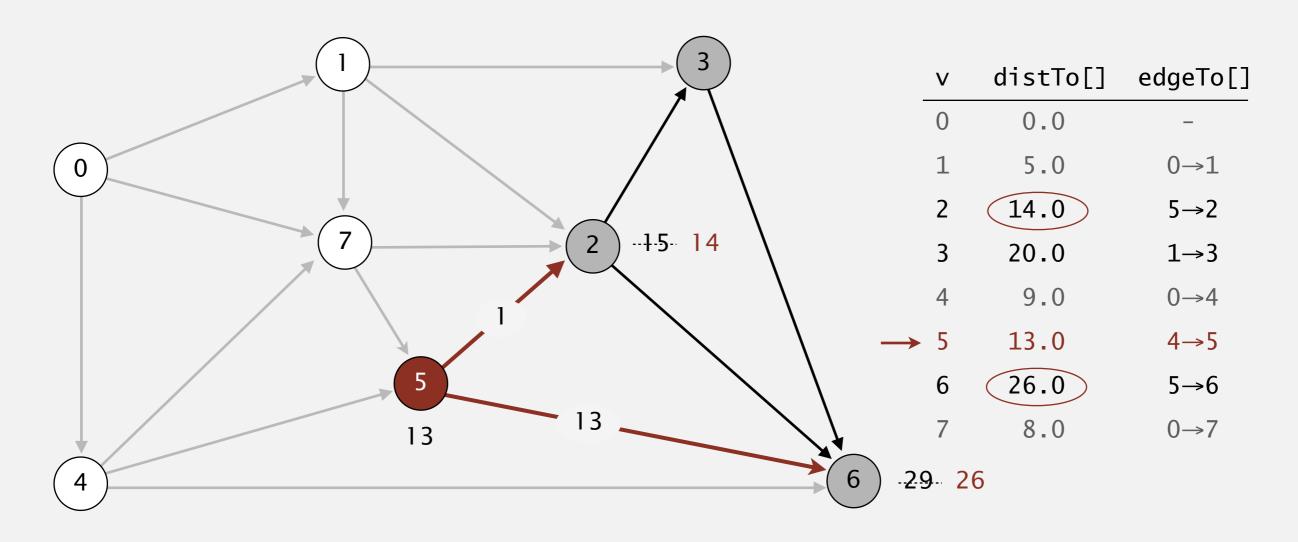
select vertex 5

- Consider vertices in increasing order of distance from s
  (non-tree vertex with the lowest distTo[] value).
- Add vertex to tree and relax all edges pointing from that vertex.



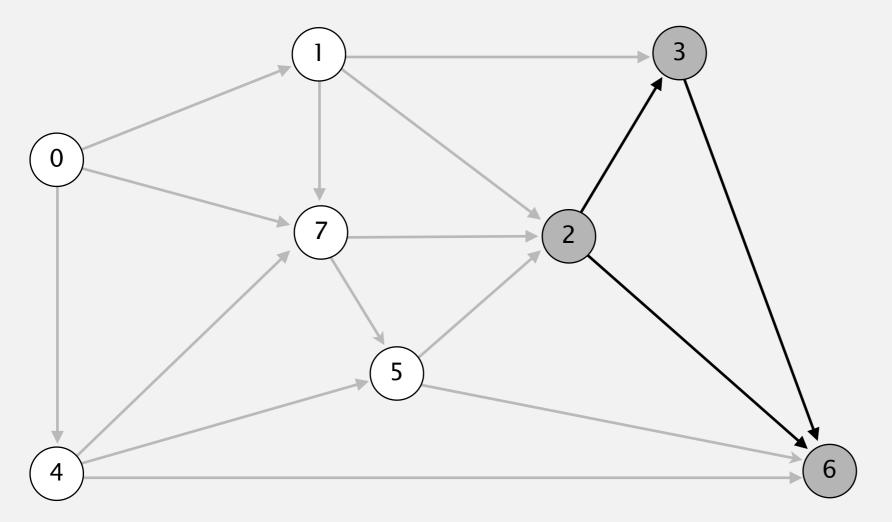
relax all edges pointing from 5

- Consider vertices in increasing order of distance from s
  (non-tree vertex with the lowest distTo[] value).
- Add vertex to tree and relax all edges pointing from that vertex.



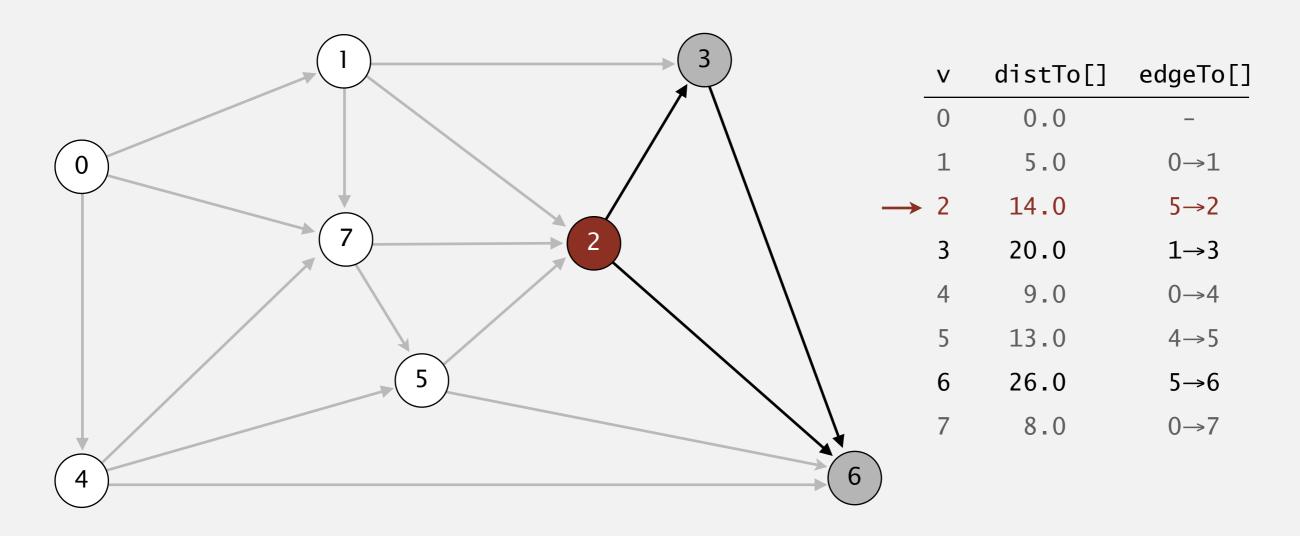
relax all edges pointing from 5

- Consider vertices in increasing order of distance from s
  (non-tree vertex with the lowest distTo[] value).
- Add vertex to tree and relax all edges pointing from that vertex.



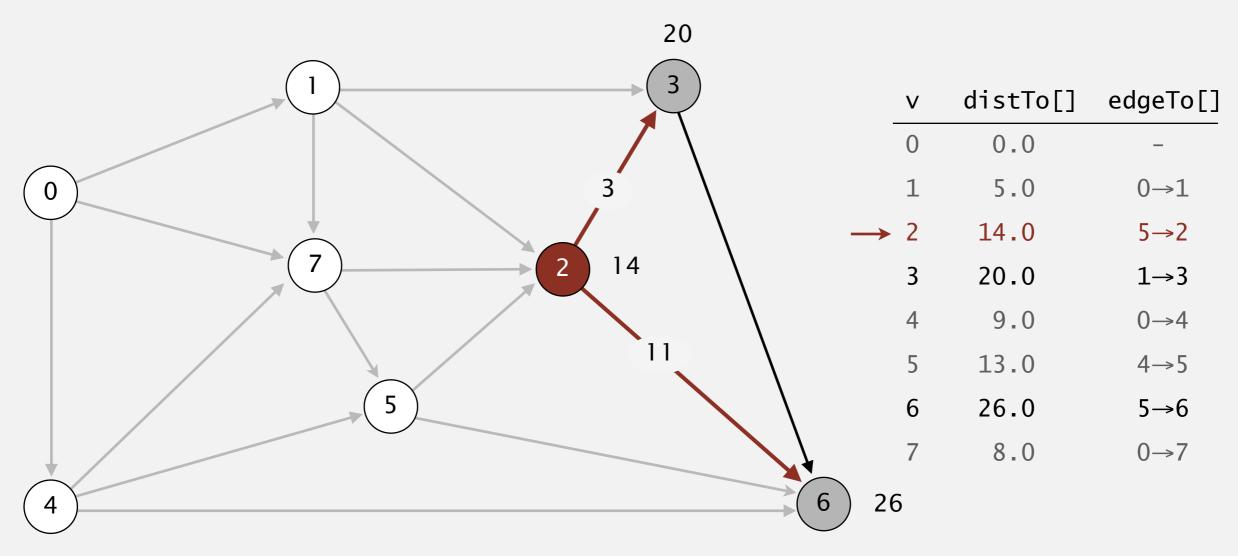
	V	distTo[]	edgeTo[]
_	0	0.0	-
	1	5.0	0→1
	2	14.0	5→2
	3	20.0	1→3
	4	9.0	0→4
	5	13.0	4→5
	6	26.0	5→6
	7	8.0	0→7

- Consider vertices in increasing order of distance from s
  (non-tree vertex with the lowest distTo[] value).
- Add vertex to tree and relax all edges pointing from that vertex.



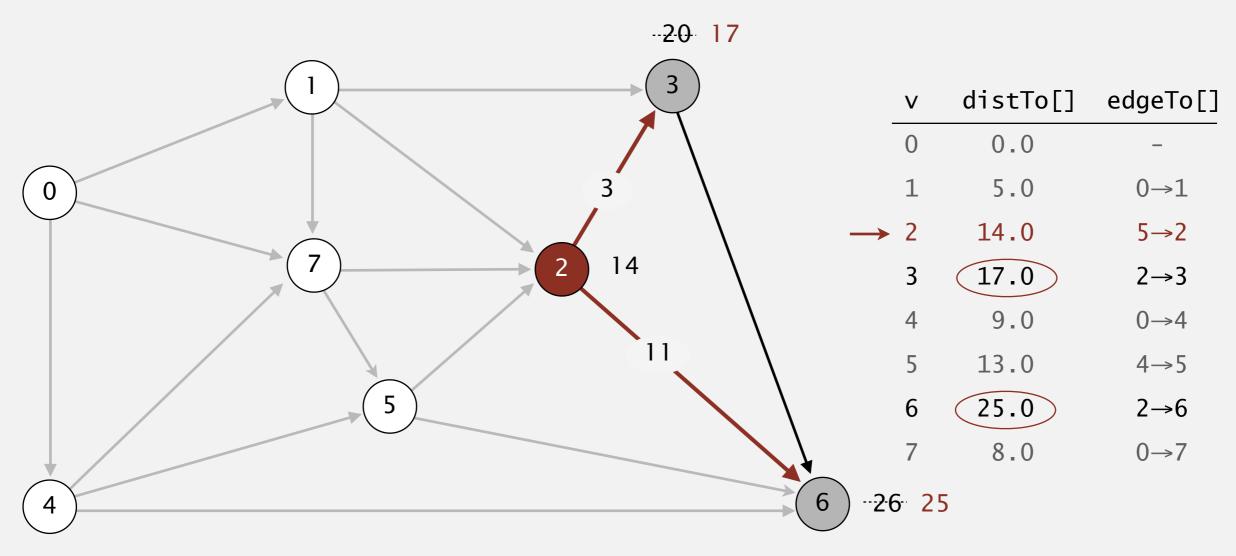
select vertex 2

- Consider vertices in increasing order of distance from s
  (non-tree vertex with the lowest distTo[] value).
- Add vertex to tree and relax all edges pointing from that vertex.



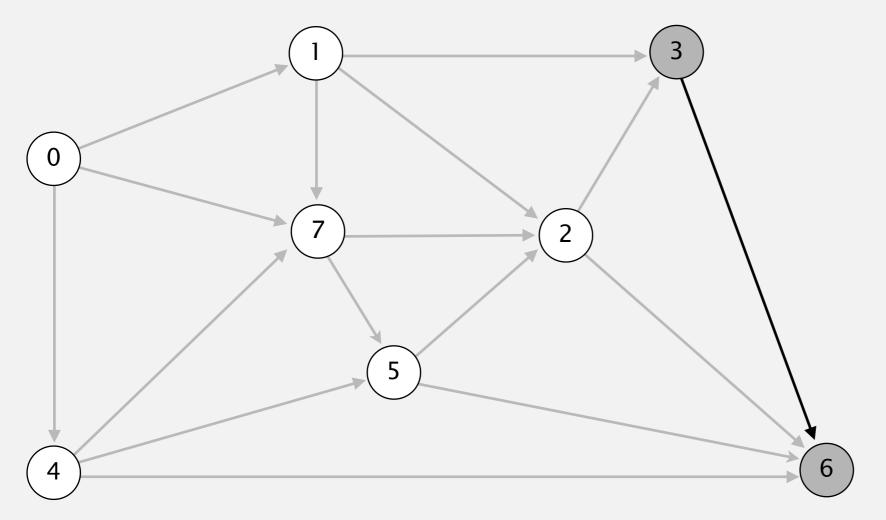
relax all edges pointing from 2

- Consider vertices in increasing order of distance from s
  (non-tree vertex with the lowest distTo[] value).
- Add vertex to tree and relax all edges pointing from that vertex.



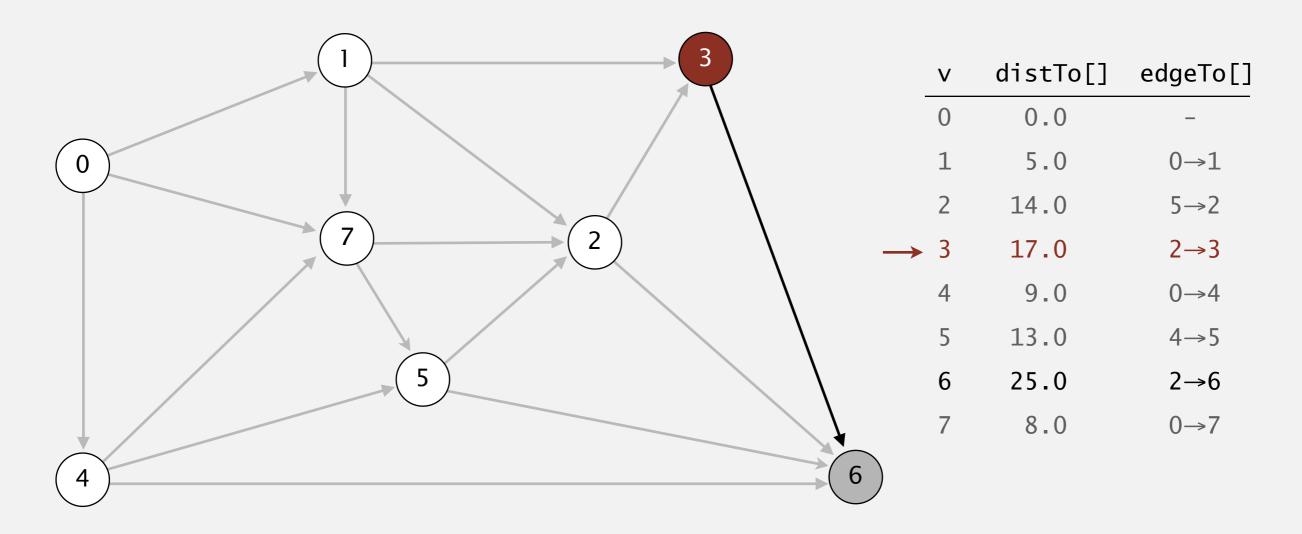
relax all edges pointing from 2

- Consider vertices in increasing order of distance from s
  (non-tree vertex with the lowest distTo[] value).
- Add vertex to tree and relax all edges pointing from that vertex.



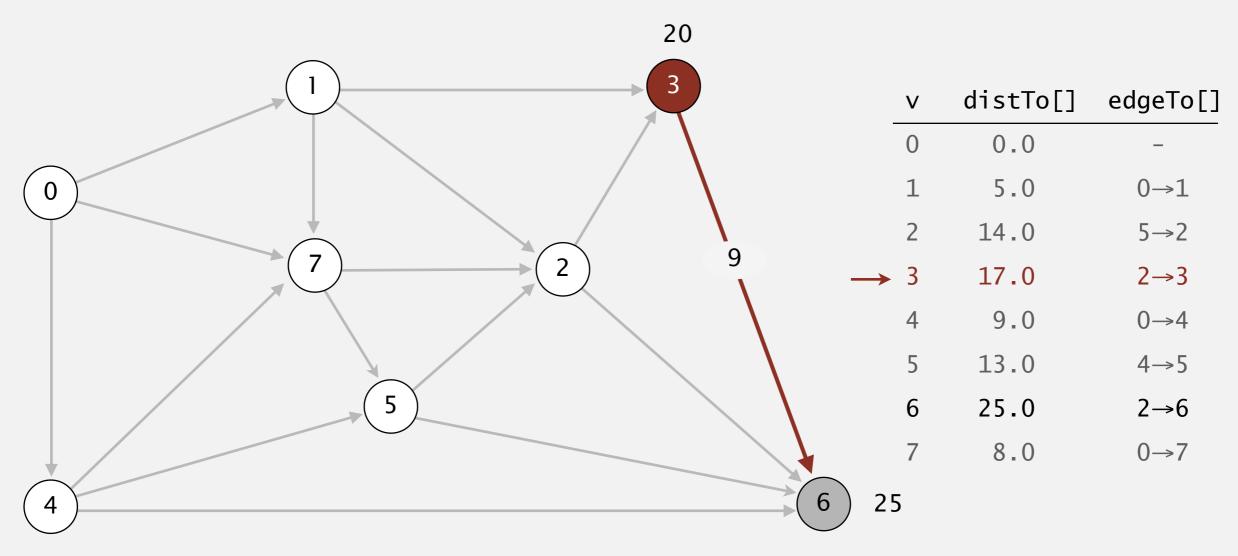
V	distTo[]	edgeTo[]
0	0.0	_
1	5.0	0→1
2	14.0	5→2
3	17.0	2→3
4	9.0	0→4
5	13.0	4→5
6	25.0	2→6
7	8.0	0→7

- Consider vertices in increasing order of distance from s
  (non-tree vertex with the lowest distTo[] value).
- Add vertex to tree and relax all edges pointing from that vertex.



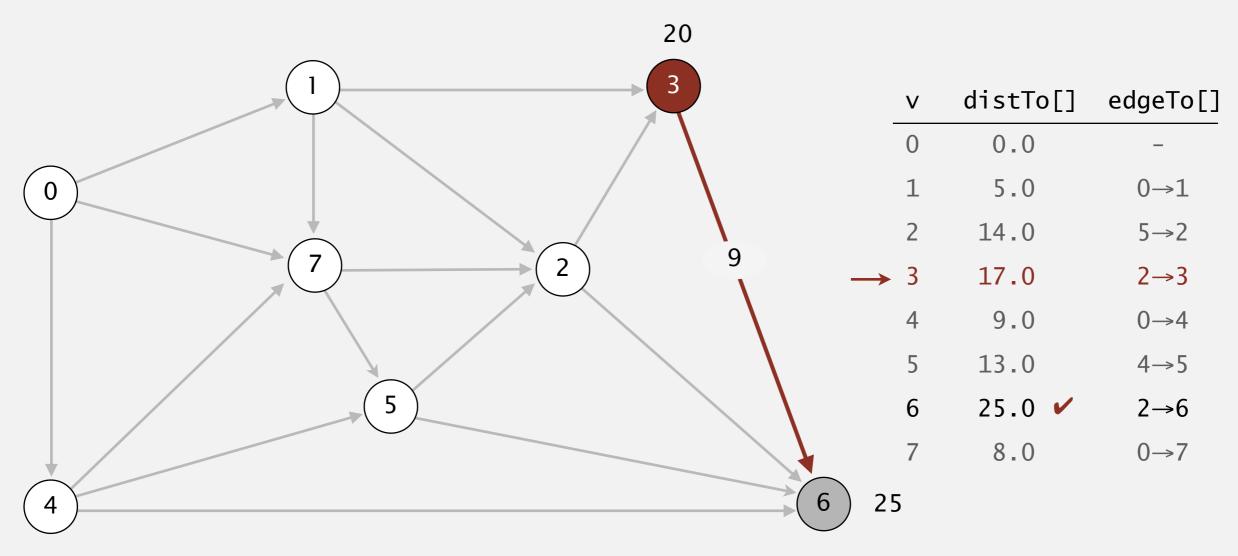
select vertex 3

- Consider vertices in increasing order of distance from s
  (non-tree vertex with the lowest distTo[] value).
- Add vertex to tree and relax all edges pointing from that vertex.



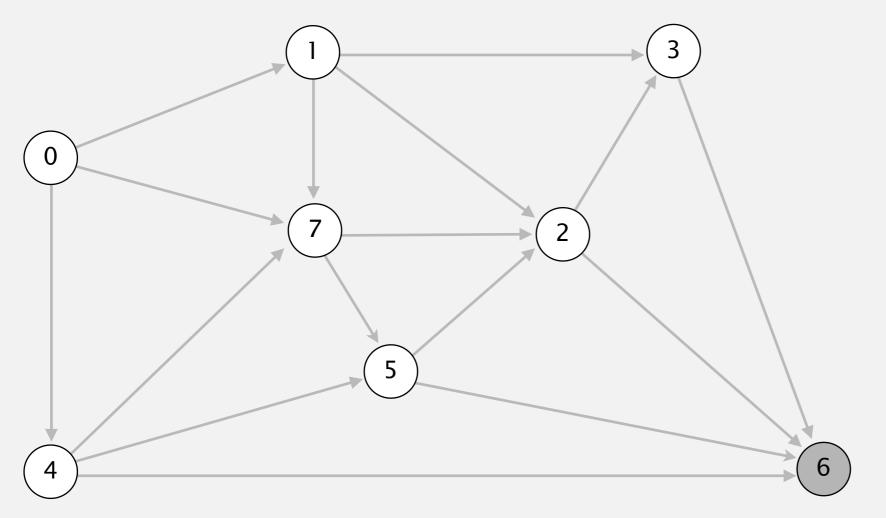
relax all edges pointing from 3

- Consider vertices in increasing order of distance from s
  (non-tree vertex with the lowest distTo[] value).
- Add vertex to tree and relax all edges pointing from that vertex.



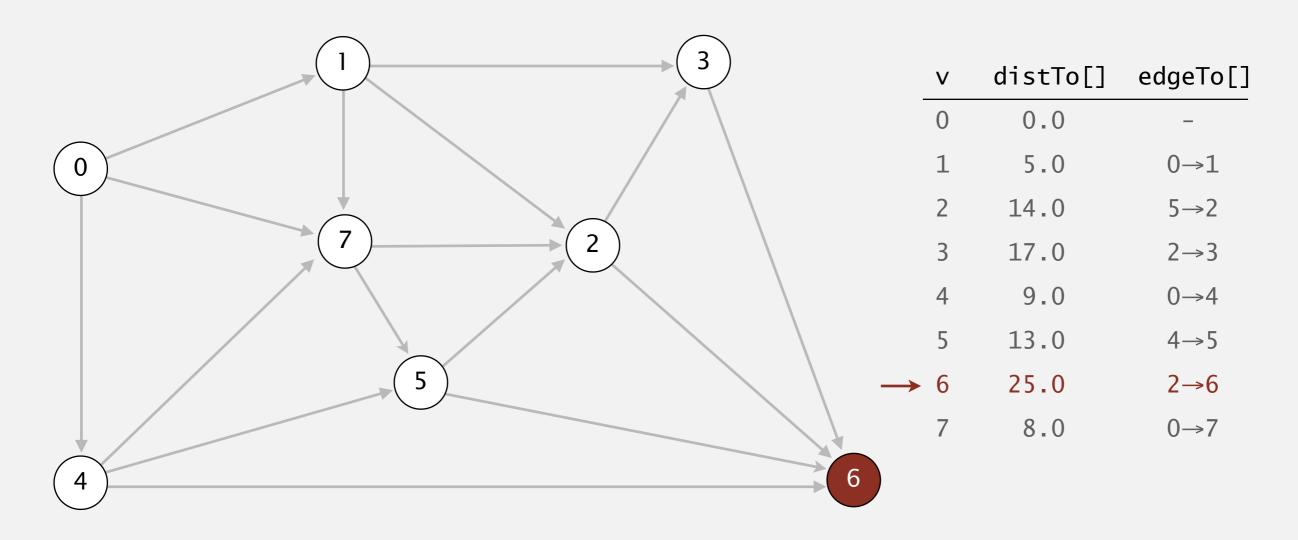
relax all edges pointing from 3

- Consider vertices in increasing order of distance from s
  (non-tree vertex with the lowest distTo[] value).
- Add vertex to tree and relax all edges pointing from that vertex.



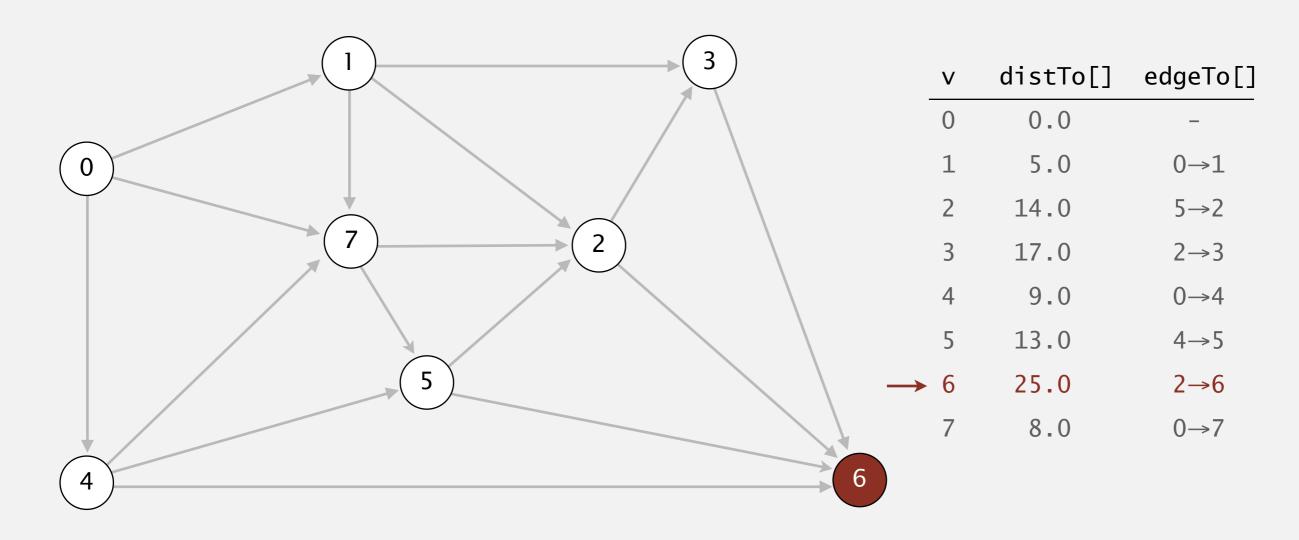
V	distTo[]	edgeTo[]
0	0.0	-
1	5.0	0→1
2	14.0	5→2
3	17.0	2→3
4	9.0	0→4
5	13.0	4→5
6	25.0	2→6
7	8.0	0→7

- Consider vertices in increasing order of distance from s
  (non-tree vertex with the lowest distTo[] value).
- Add vertex to tree and relax all edges pointing from that vertex.



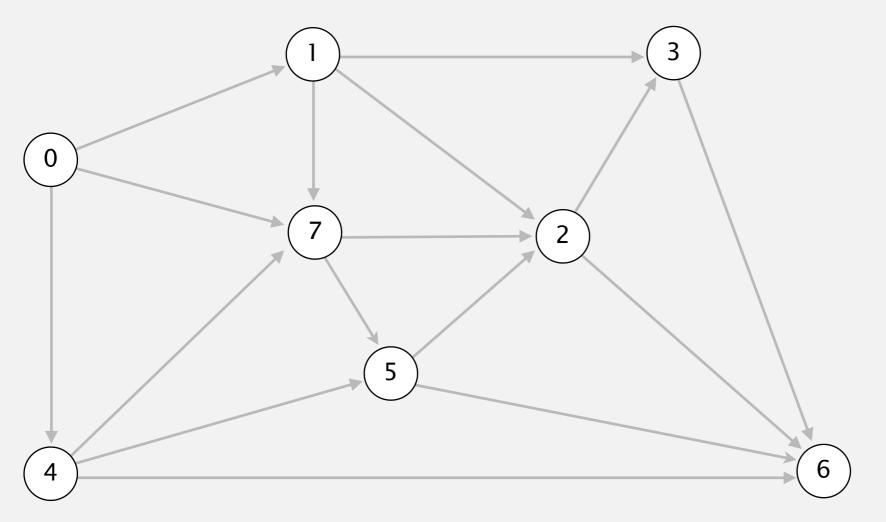
select vertex 6

- Consider vertices in increasing order of distance from s
  (non-tree vertex with the lowest distTo[] value).
- Add vertex to tree and relax all edges pointing from that vertex.



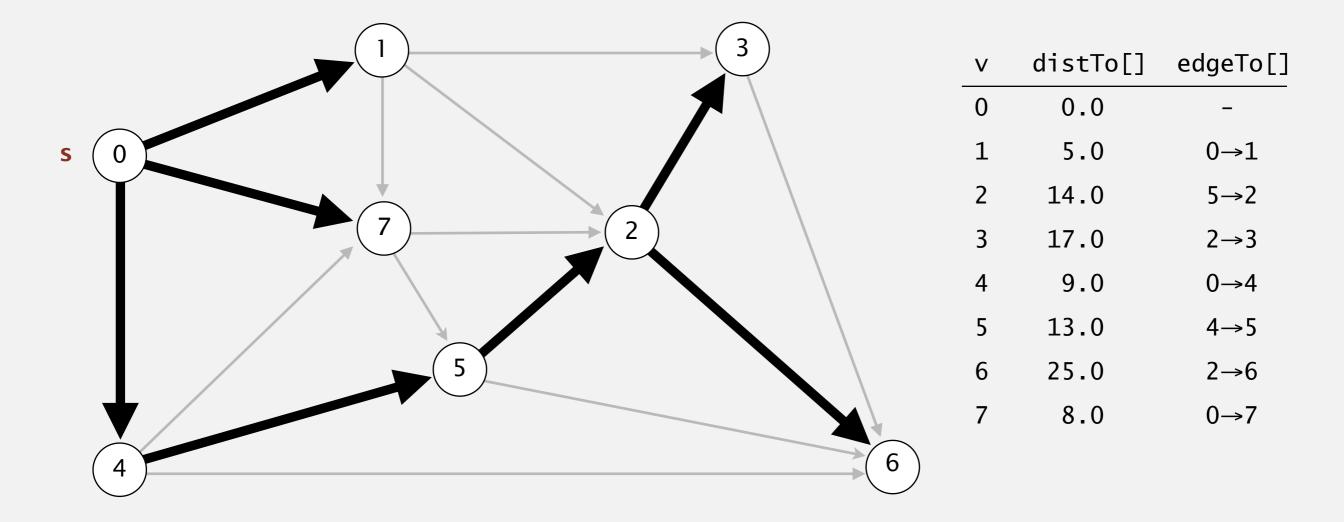
relax all edges pointing from 6

- Consider vertices in increasing order of distance from s
  (non-tree vertex with the lowest distTo[] value).
- Add vertex to tree and relax all edges pointing from that vertex.



V	distTo[]	edgeTo[]
0	0.0	-
1	5.0	0→1
2	14.0	5→2
3	17.0	2→3
4	9.0	0→4
5	13.0	4→5
6	25.0	2→6
7	8.0	0→7

- Consider vertices in increasing order of distance from s
  (non-tree vertex with the lowest distTo[] value).
- Add vertex to tree and relax all edges pointing from that vertex.



shortest-paths tree from vertex s