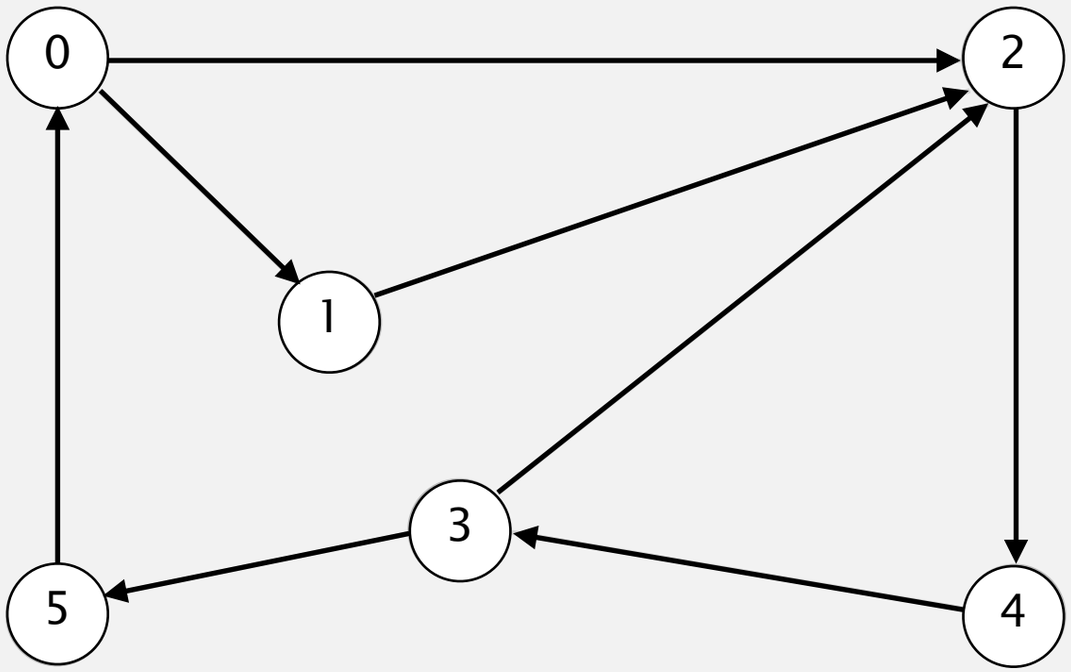
http://algs4.cs.princeton.edu

4.2 DIRECTED BFS DEMO

Directed breadth-first search demo

Repeat until queue is empty:

- Remove vertex v from queue.
- Add to queue all unmarked vertices pointing from v and mark them.



graph G

tinyDG2.txt

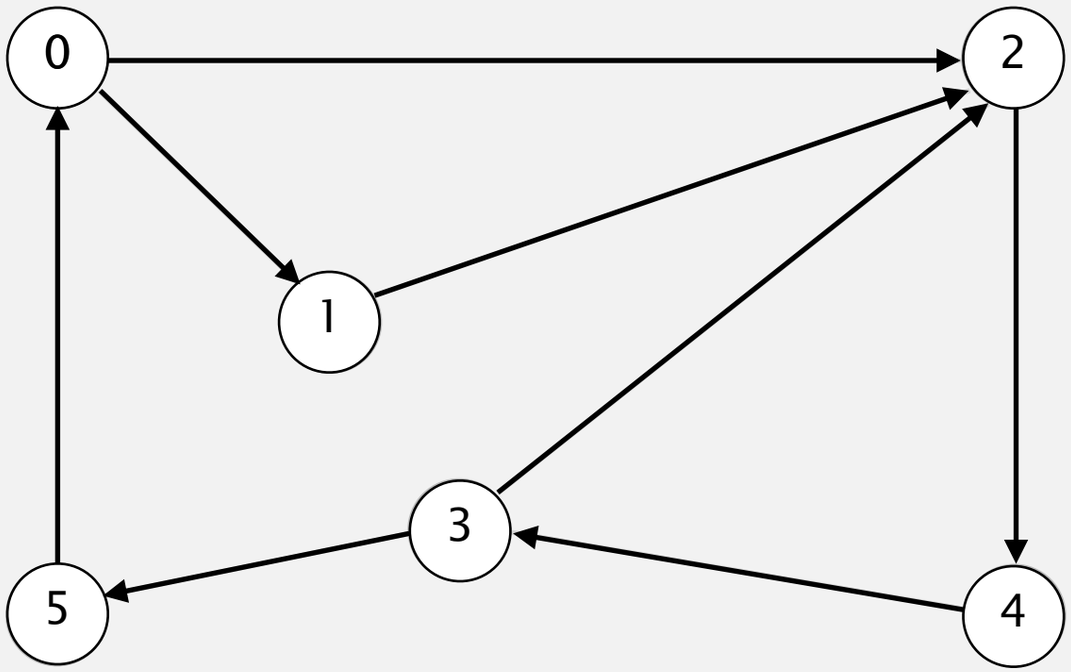
```
V
6
8
5 0
2 4
3 2
1 2
0 1
4 3
3 5
0 2
```

E

Directed breadth-first search demo

Repeat until queue is empty:

- Remove vertex v from queue.
- Add to queue all unmarked vertices pointing from v and mark them.



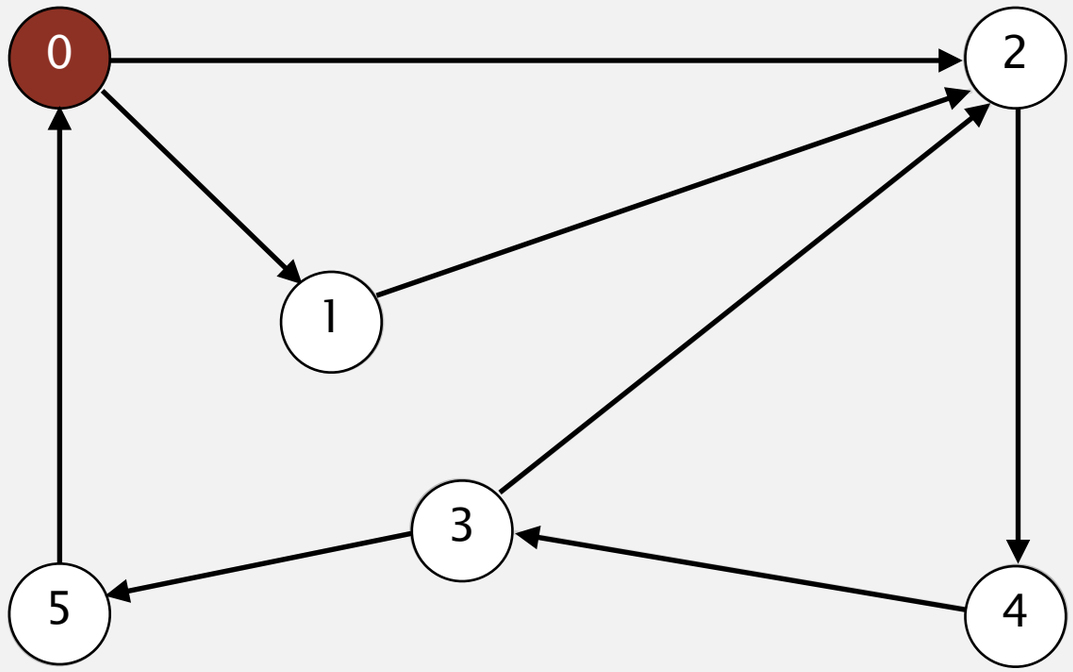
queue	v	edgeTo[]	distTo[]
	0	–	0
	1	–	–
	2	–	–
	3	–	–
	4	–	–
	5	–	–

add 0 to queue

Directed breadth-first search demo

Repeat until queue is empty:

- Remove vertex v from queue.
- Add to queue all unmarked vertices pointing from v and mark them.



queue
0

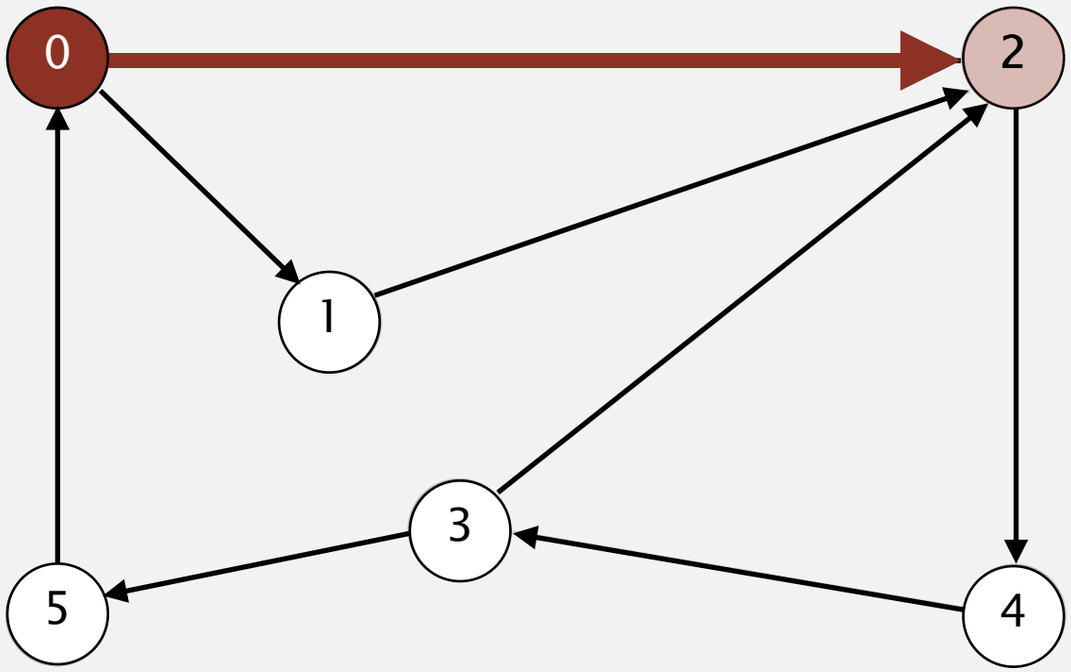
v	edgeTo[]	distTo[]
0	–	0
1	–	–
2	–	–
3	–	–
4	–	–
5	–	–

dequeue 0

Directed breadth-first search demo

Repeat until queue is empty:

- Remove vertex v from queue.
- Add to queue all unmarked vertices pointing from v and mark them.



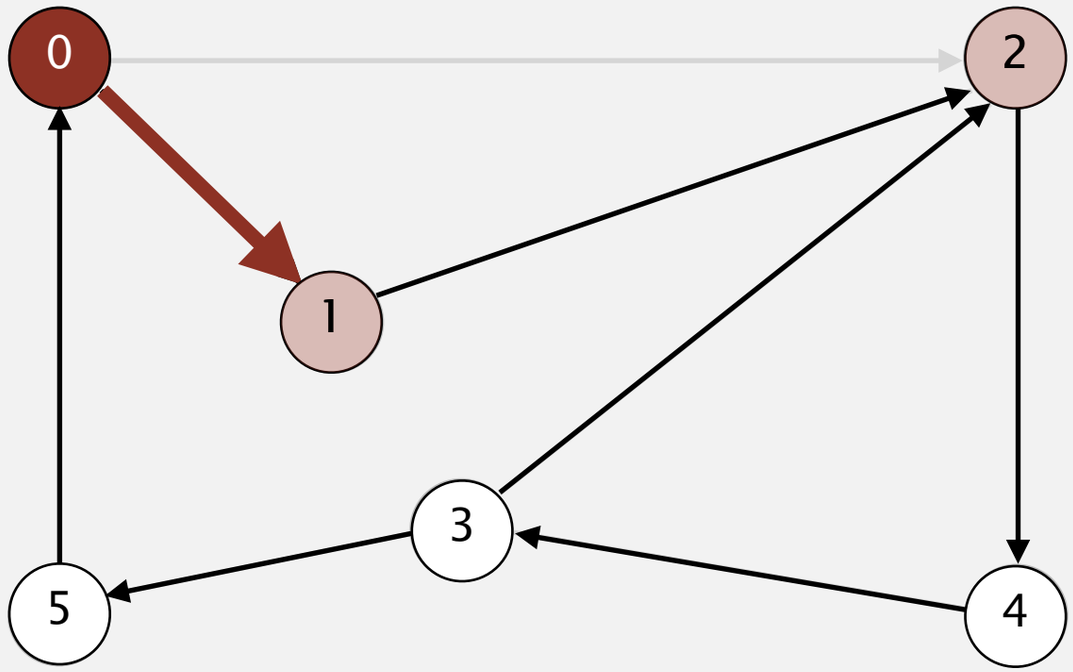
queue	v	edgeTo[]	distTo[]
	0	–	0
	1	–	–
	2	0	1
	3	–	–
	4	–	–
	5	–	–

dequeue 0: check 2 and check 1

Directed breadth-first search demo

Repeat until queue is empty:

- Remove vertex v from queue.
- Add to queue all unmarked vertices pointing from v and mark them.



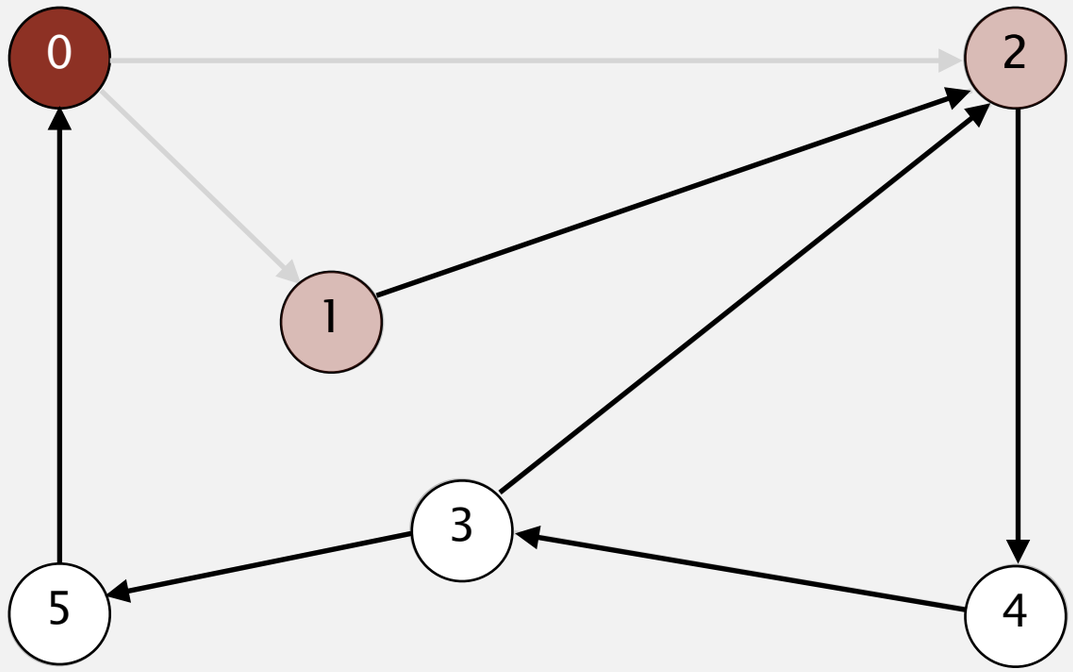
queue	v	edgeTo[]	distTo[]
	0	–	0
	1	0	1
	2	0	1
	3	–	–
	4	–	–
	5	–	–
2			

dequeue 0: check 2 and **check 1**

Directed breadth-first search demo

Repeat until queue is empty:

- Remove vertex v from queue.
- Add to queue all unmarked vertices pointing from v and mark them.



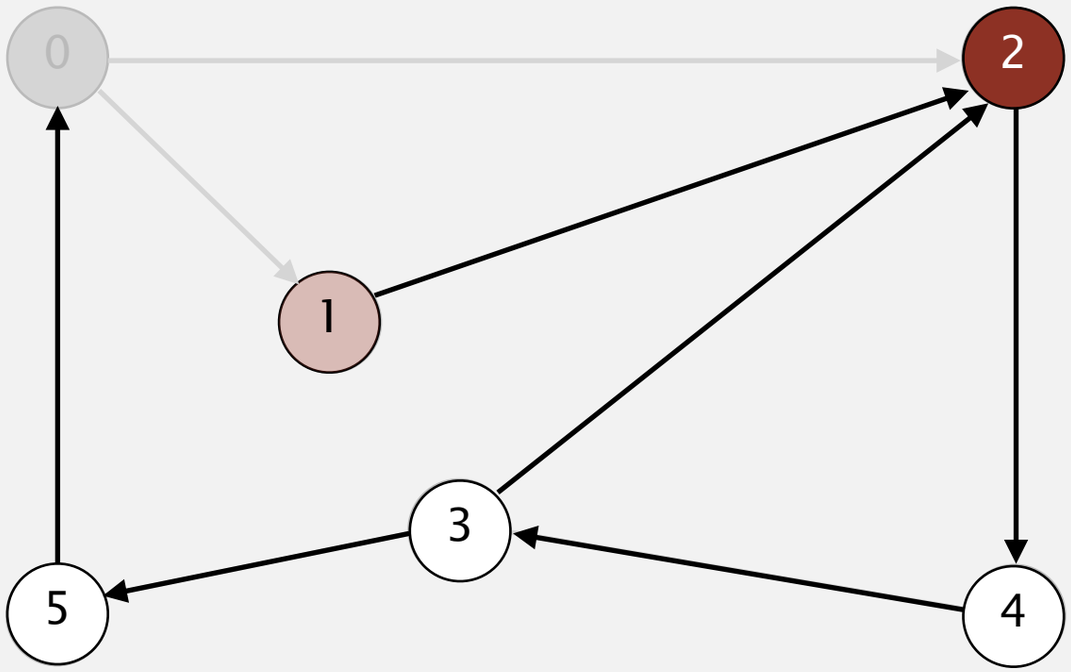
queue	v	edgeTo[]	distTo[]
	0	–	0
	1	0	1
	2	0	1
	3	–	–
	4	–	–
	5	–	–
1			
2			

0 done

Directed breadth-first search demo

Repeat until queue is empty:

- Remove vertex v from queue.
- Add to queue all unmarked vertices pointing from v and mark them.



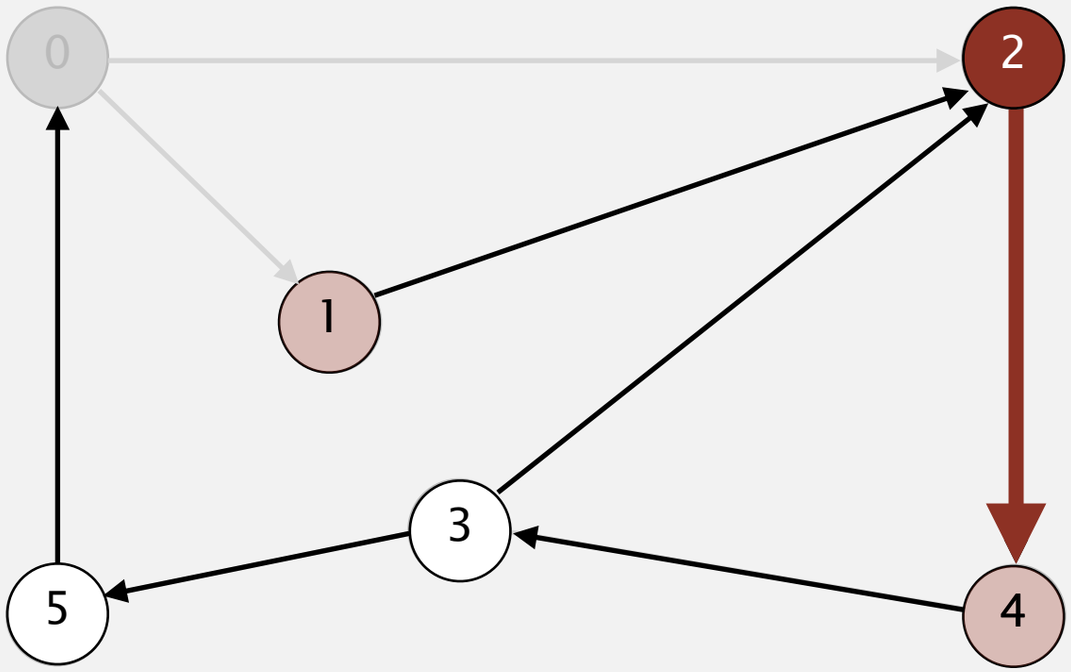
queue	v	edgeTo[]	distTo[]
	0	–	0
	1	0	1
	2	0	1
	3	–	–
	4	–	–
	5	–	–
1			
2			

dequeue 2

Directed breadth-first search demo

Repeat until queue is empty:

- Remove vertex v from queue.
- Add to queue all unmarked vertices pointing from v and mark them.



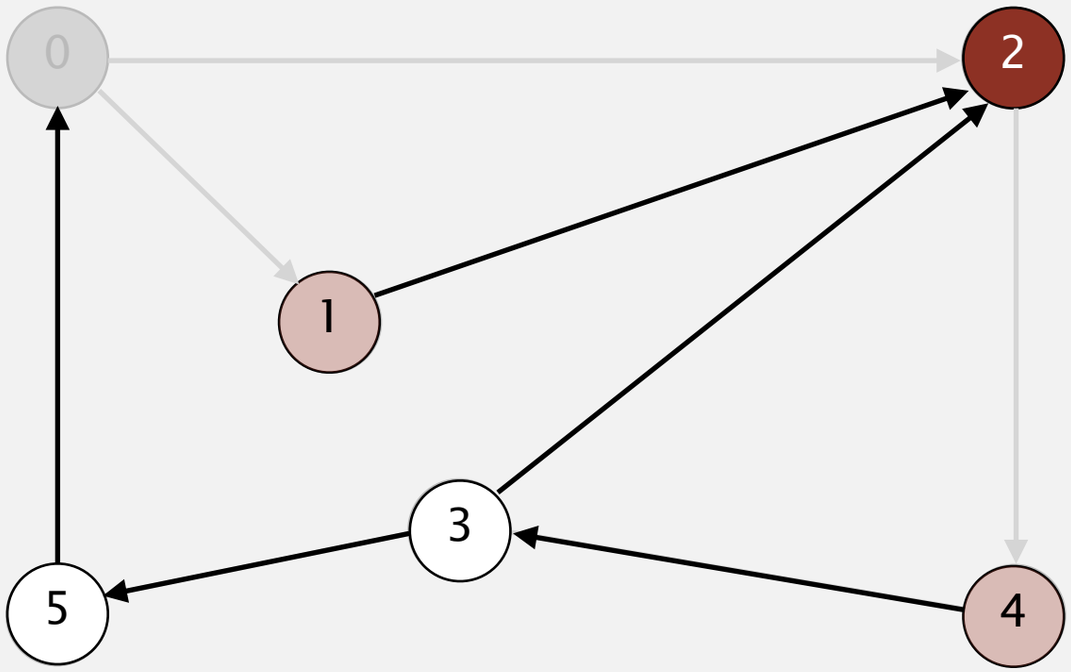
queue	v	edgeTo[]	distTo[]
	0	–	0
	1	0	1
	2	0	1
	3	–	–
	4	2	2
	5	–	–
1			

dequeue 2: check 4

Directed breadth-first search demo

Repeat until queue is empty:

- Remove vertex v from queue.
- Add to queue all unmarked vertices pointing from v and mark them.



queue
4
1

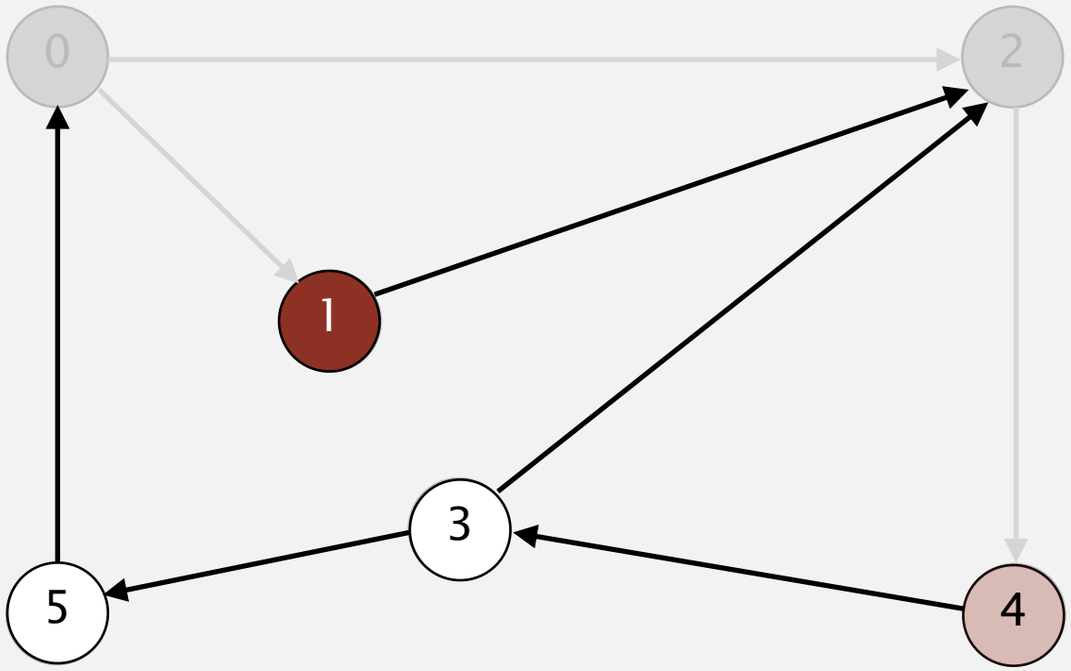
v	edgeTo[]	distTo[]
0	–	0
1	0	1
2	0	1
3	–	–
4	2	2
5	–	–

2 done

Directed breadth-first search demo

Repeat until queue is empty:

- Remove vertex v from queue.
- Add to queue all unmarked vertices pointing from v and mark them.



queue
4
1

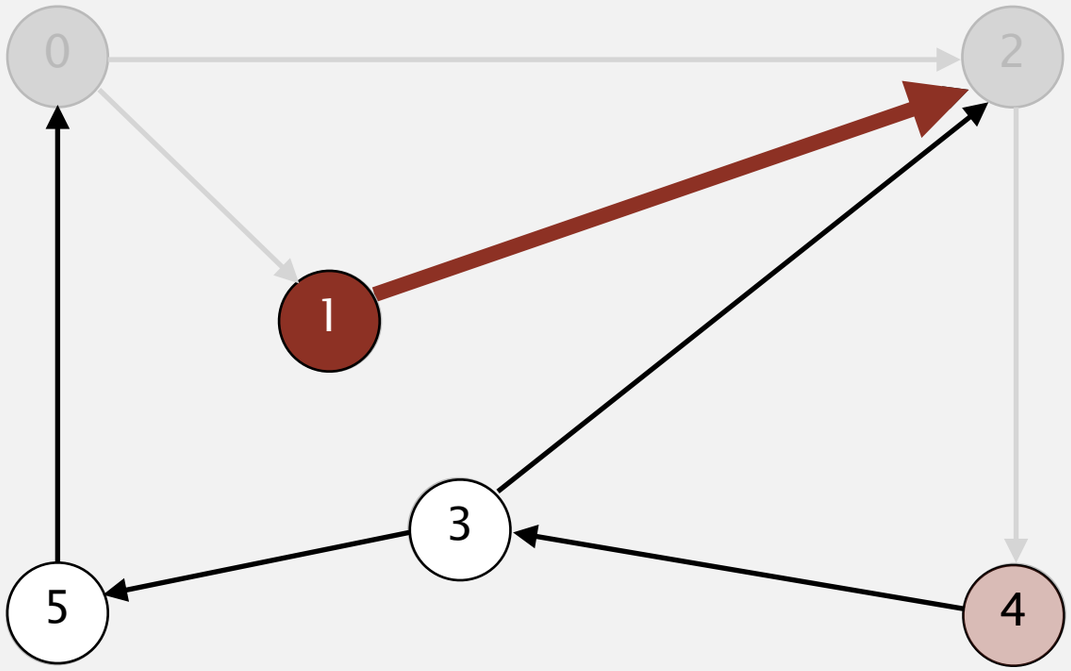
v	edgeTo[]	distTo[]
0	–	0
1	0	1
2	0	1
3	–	–
4	2	2
5	–	–

dequeue 1

Directed breadth-first search demo

Repeat until queue is empty:

- Remove vertex v from queue.
- Add to queue all unmarked vertices pointing from v and mark them.



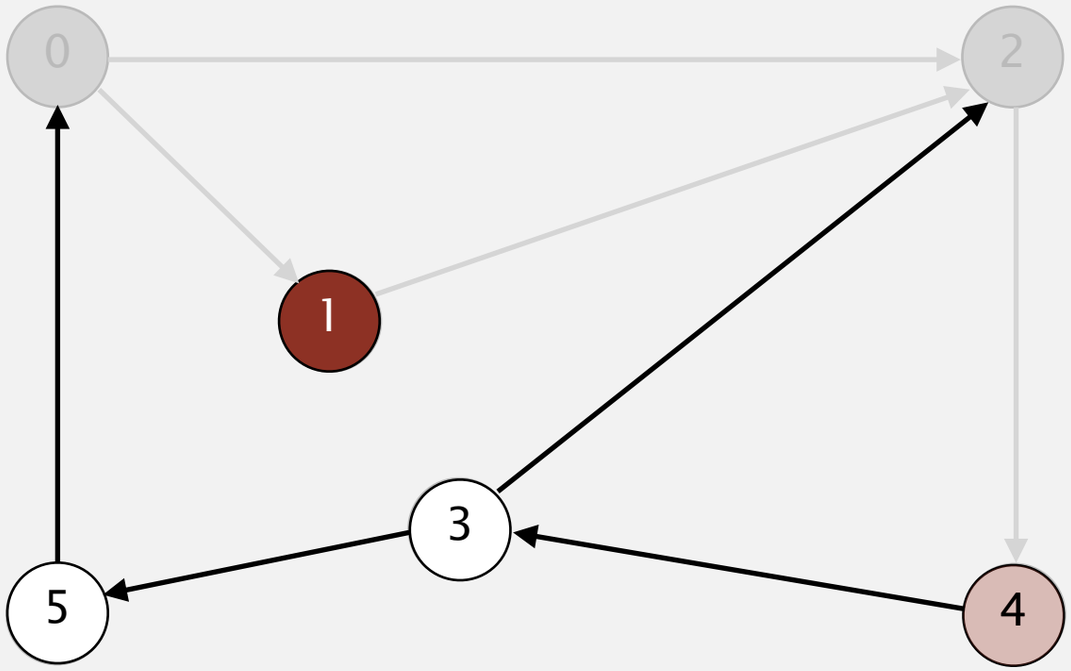
queue	v	edgeTo[]	distTo[]
	0	–	0
	1	0	1
	2	0	1
	3	–	–
	4	2	2
	5	–	–
4			

dequeue 1; check 2

Directed breadth-first search demo

Repeat until queue is empty:

- Remove vertex v from queue.
- Add to queue all unmarked vertices pointing from v and mark them.



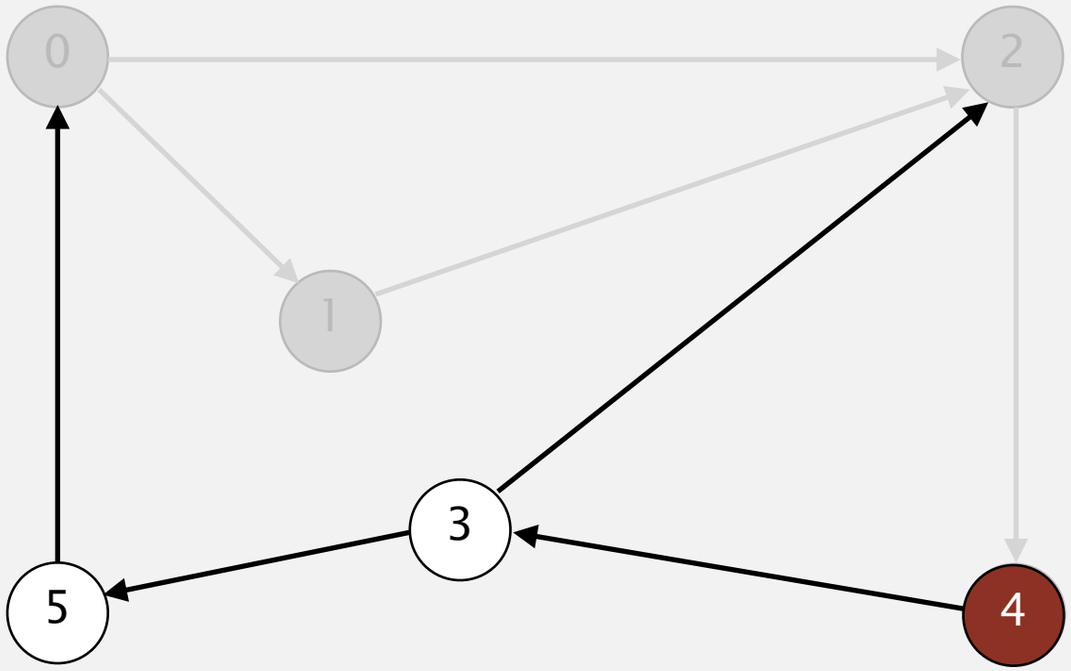
queue	v	edgeTo[]	distTo[]
	0	–	0
	1	0	1
	2	0	1
	3	–	–
	4	2	2
	5	–	–
4			

1 done

Directed breadth-first search demo

Repeat until queue is empty:

- Remove vertex v from queue.
- Add to queue all unmarked vertices pointing from v and mark them.



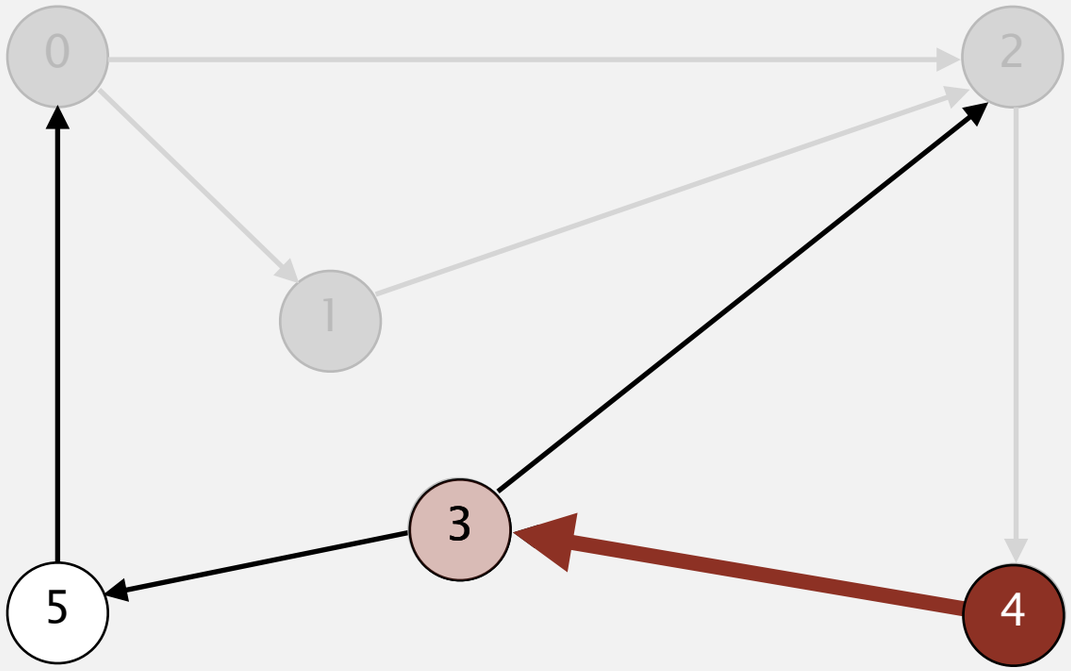
queue	v	edgeTo[]	distTo[]
	0	–	0
	1	0	1
	2	0	1
	3	–	–
	4	2	2
	5	–	–
4			

dequeue 4

Directed breadth-first search demo

Repeat until queue is empty:

- Remove vertex v from queue.
- Add to queue all unmarked vertices pointing from v and mark them.



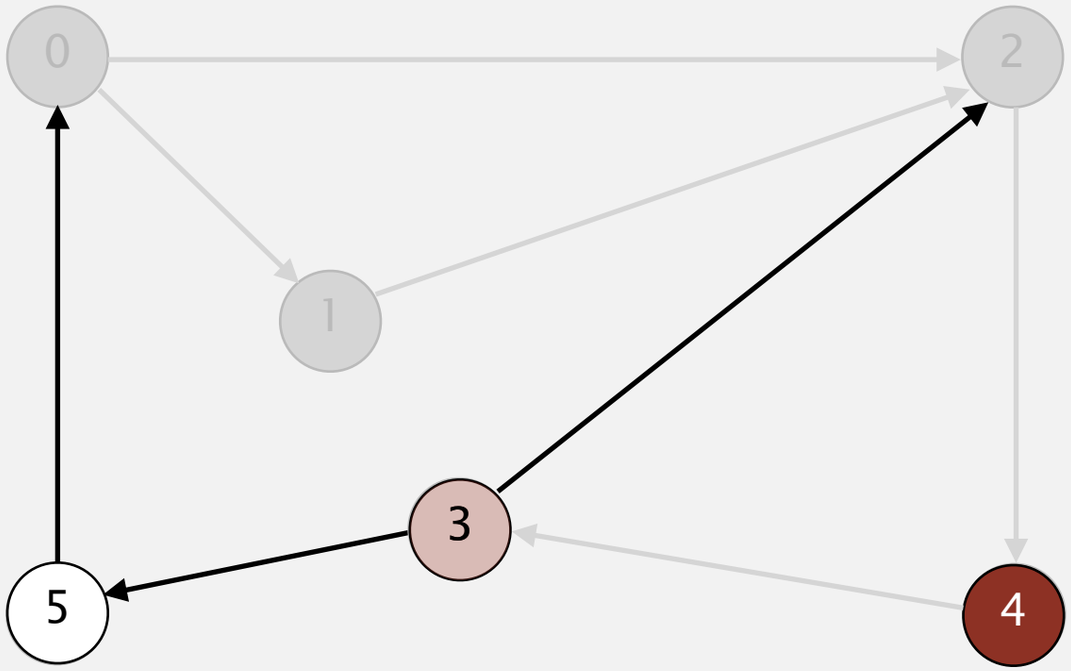
queue	v	edgeTo[]	distTo[]
	0	–	0
	1	0	1
	2	0	1
	3	4	3
	4	2	2
	5	–	–

dequeue 4: check 3

Directed breadth-first search demo

Repeat until queue is empty:

- Remove vertex v from queue.
- Add to queue all unmarked vertices pointing from v and mark them.



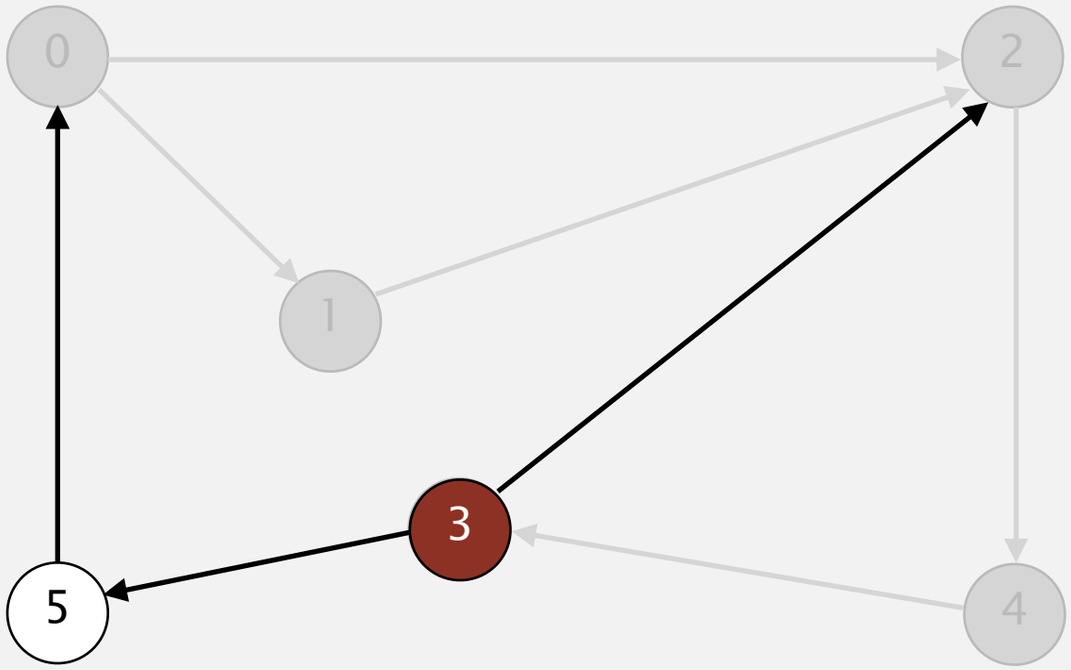
queue	v	edgeTo[]	distTo[]
	0	–	0
	1	0	1
	2	0	1
	3	4	3
	4	2	2
	5	–	–
3			

4 done

Directed breadth-first search demo

Repeat until queue is empty:

- Remove vertex v from queue.
- Add to queue all unmarked vertices pointing from v and mark them.



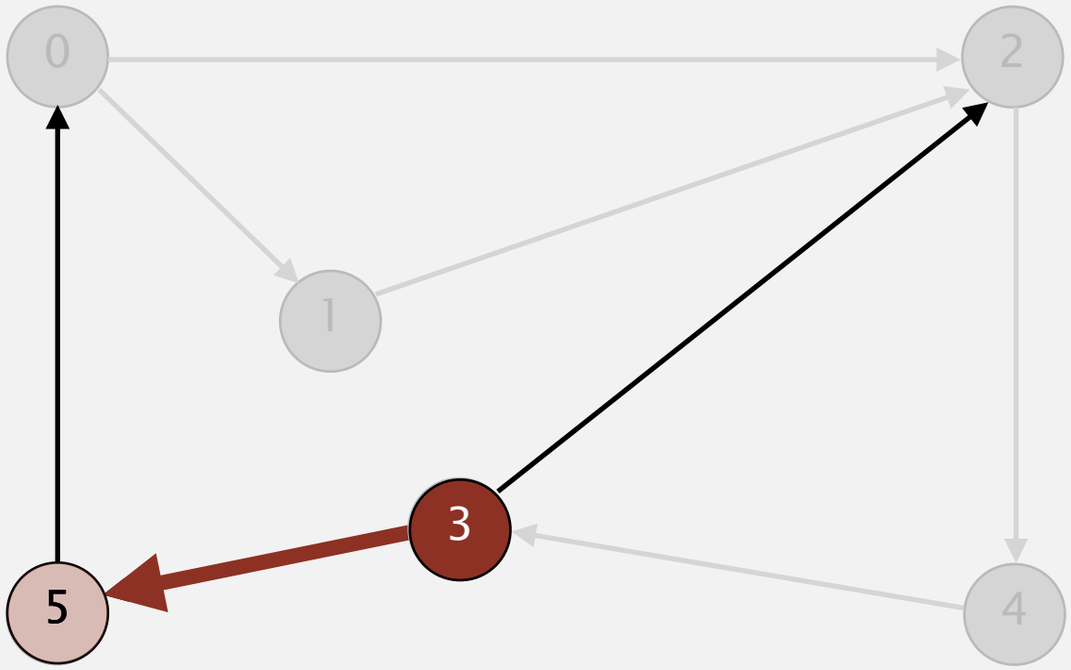
queue	v	edgeTo[]	distTo[]
	0	–	0
	1	0	1
	2	0	1
	3	4	3
	4	2	2
	5	–	–
3			

dequeue 3

Directed breadth-first search demo

Repeat until queue is empty:

- Remove vertex v from queue.
- Add to queue all unmarked vertices pointing from v and mark them.



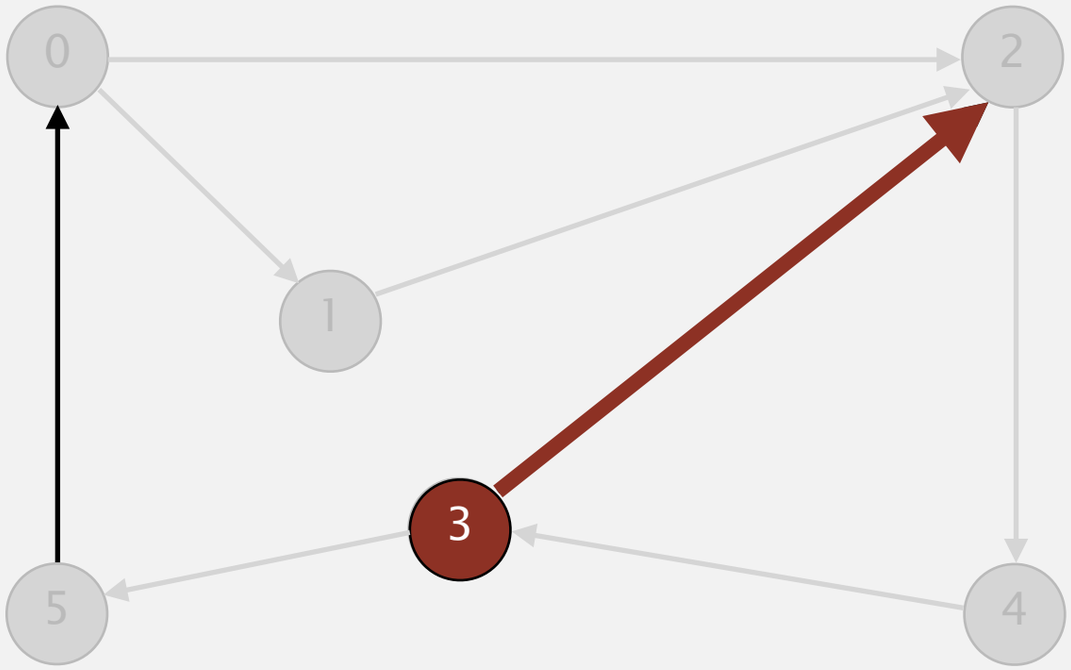
queue	v	edgeTo[]	distTo[]
	0	–	0
	1	0	1
	2	0	1
	3	4	3
	4	2	2
	5	3	4

dequeue 3: check 5 and check 2

Directed breadth-first search demo

Repeat until queue is empty:

- Remove vertex v from queue.
- Add to queue all unmarked vertices pointing from v and mark them.



queue
5

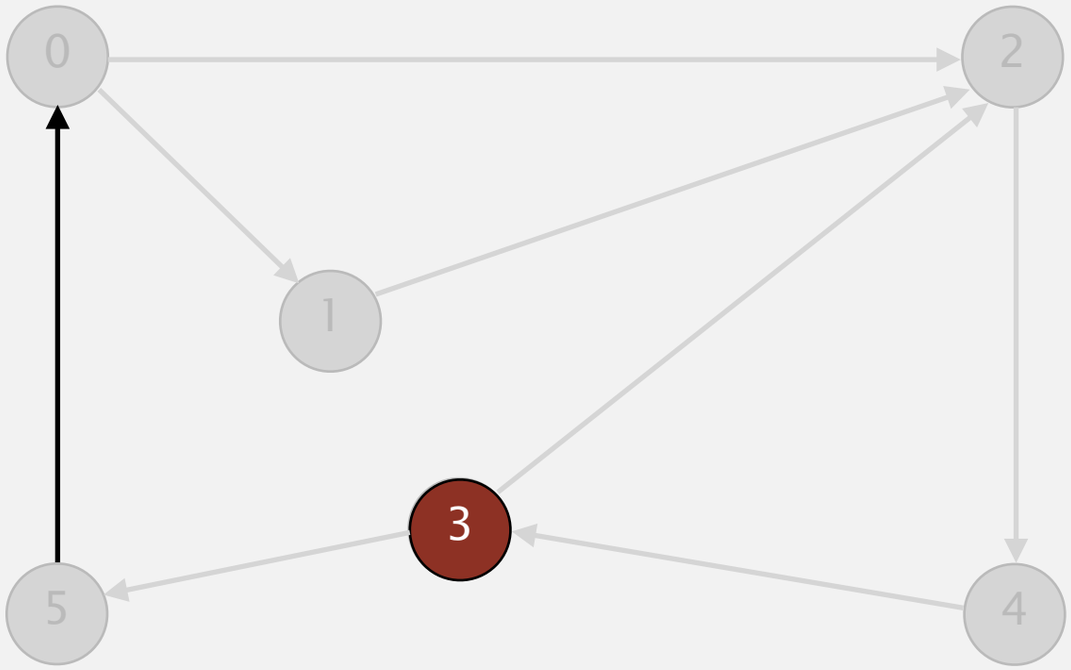
v	edgeTo[]	distTo[]
0	–	0
1	0	1
2	0	1
3	4	3
4	2	2
5	3	4

dequeue 3: check 5 and **check 2**

Directed breadth-first search demo

Repeat until queue is empty:

- Remove vertex v from queue.
- Add to queue all unmarked vertices pointing from v and mark them.



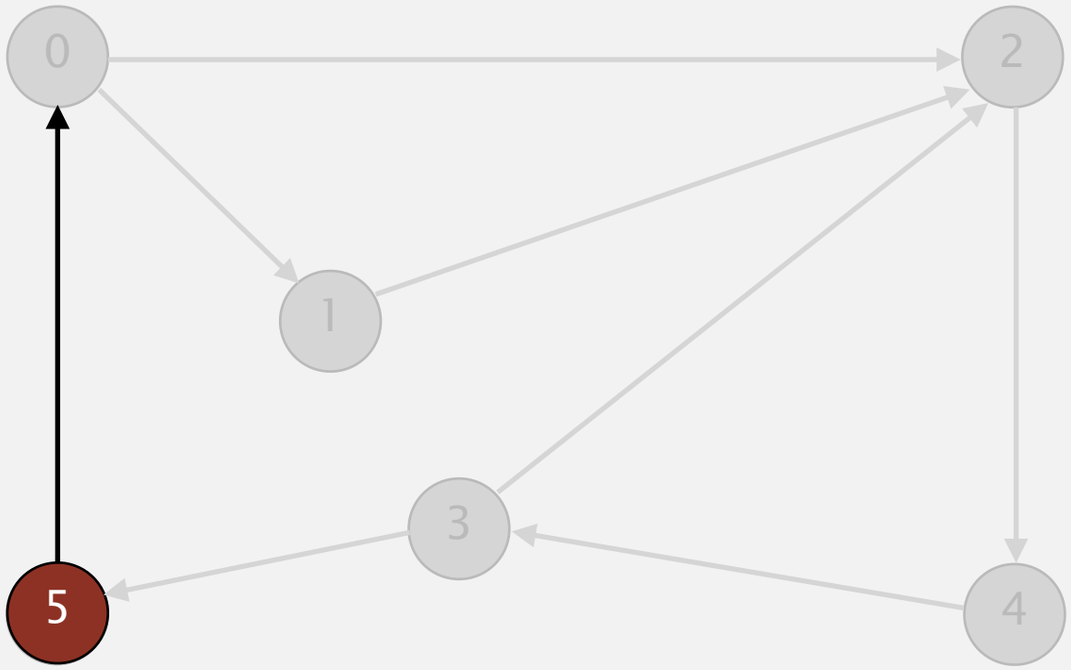
queue	v	edgeTo[]	distTo[]
	0	–	0
	1	0	1
	2	0	1
	3	4	3
	4	2	2
	5	3	4
5			

3 done

Directed breadth-first search demo

Repeat until queue is empty:

- Remove vertex v from queue.
- Add to queue all unmarked vertices pointing from v and mark them.



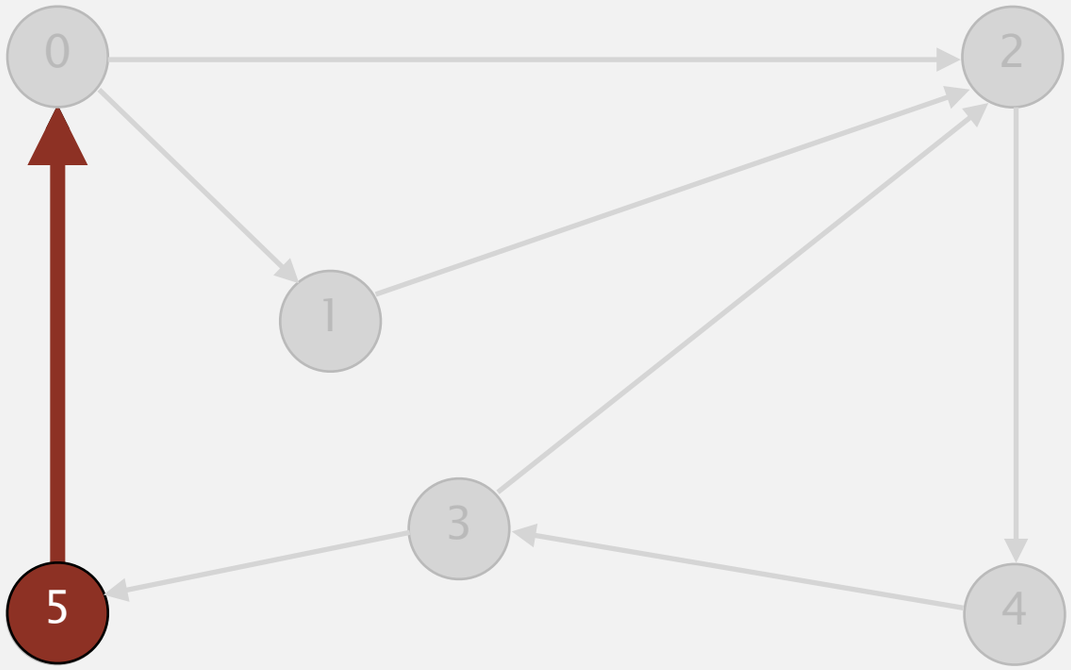
queue	v	edgeTo[]	distTo[]
	0	–	0
	1	0	1
	2	0	1
	3	4	3
	4	2	2
	5	3	4
5			

dequeue 5

Directed breadth-first search demo

Repeat until queue is empty:

- Remove vertex v from queue.
- Add to queue all unmarked vertices pointing from v and mark them.



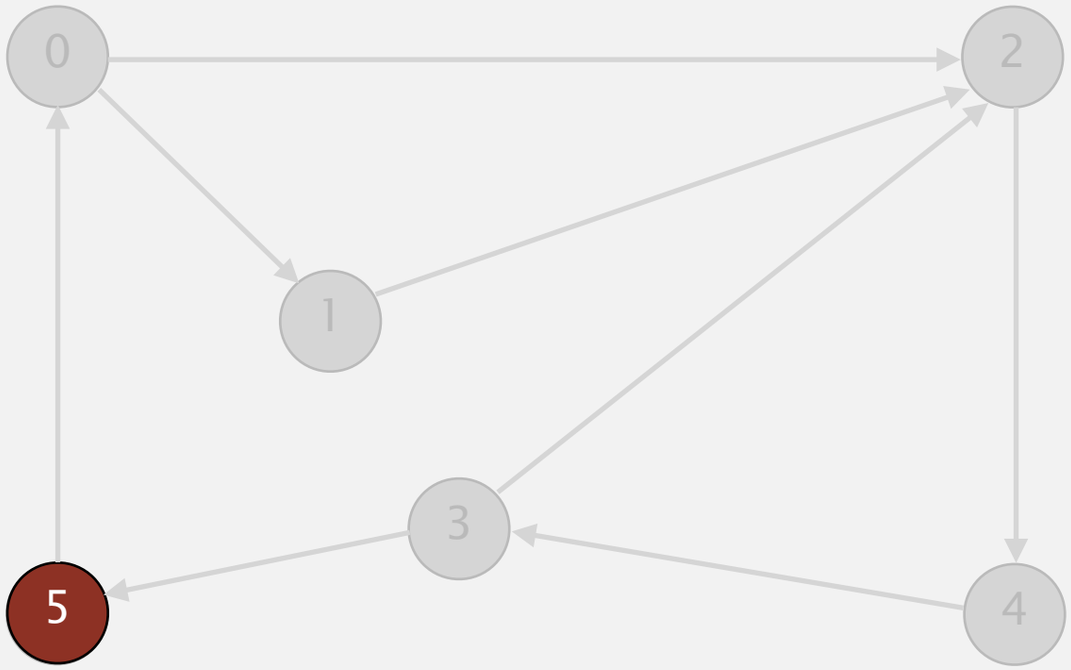
queue	v	edgeTo[]	distTo[]
	0	–	0
	1	0	1
	2	0	1
	3	4	3
	4	2	2
	5	3	4

dequeue 5: check 0

Directed breadth-first search demo

Repeat until queue is empty:

- Remove vertex v from queue.
- Add to queue all unmarked vertices pointing from v and mark them.



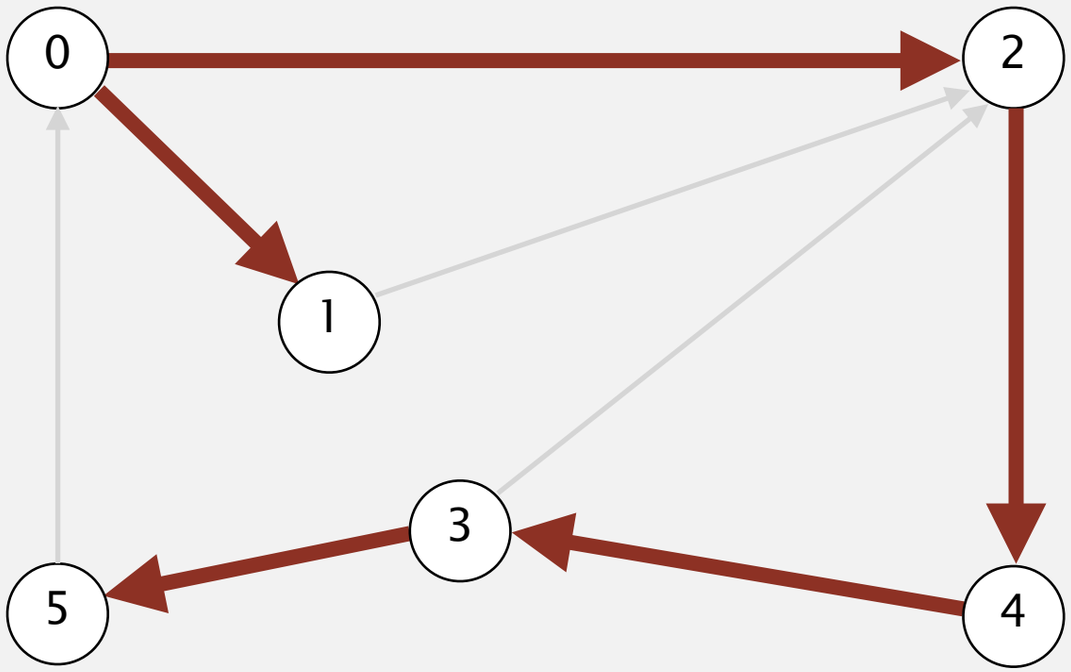
queue	v	edgeTo[]	distTo[]
	0	–	0
	1	0	1
	2	0	1
	3	4	3
	4	2	2
	5	3	4

5 done

Directed breadth-first search demo

Repeat until queue is empty:

- Remove vertex v from queue.
- Add to queue all unmarked vertices pointing from v and mark them.



v	edgeTo[]	distTo[]
0	–	0
1	0	1
2	0	1
3	4	3
4	2	2
5	3	4

done