DepthFirstPaths Demo

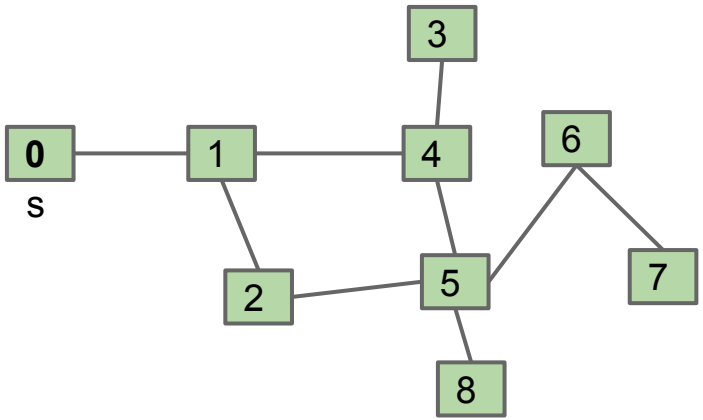
Goal: Find a path from s to every other reachable vertex, visiting each vertex at most once. dfs(v) is as follows:

- Mark v.
- For each unmarked adjacent vertex w:
  - set edgeTo[w] = v.
  - dfs(w)

#	marked	edgeTo
0	F	-
1	F	-
2	F	-
3	F	-
4	F	-
5	F	-
6	F	-
7	F	-
8	F	-

Start by calling dfs(0).

Order of dfs calls: 0



Order of dfs returns:

DepthFirstPaths Demo

Goal: Find a path from s to every other reachable vertex, visiting each vertex at most once. dfs(v) is as follows:

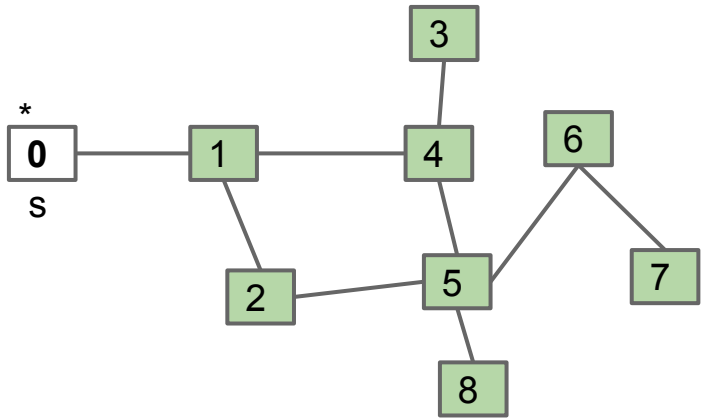
- Mark v.
- For each unmarked adjacent vertex w:
  - set edgeTo[w] = v.
  - dfs(w)

#	marked	edgeTo
0	T	-
1	F	0
2	F	-
3	F	-
4	F	-
5	F	-
6	F	-
7	F	-
8	F	-

dfs(0):
  mark(0).

  isMarked(1)? No.
  - edgeTo[1] = 0. **dfs(1).**

Order of dfs calls: 01



Order of dfs returns:

DepthFirstPaths Demo

Goal: Find a path from s to every other reachable vertex, visiting each vertex at most once. dfs(v) is as follows:

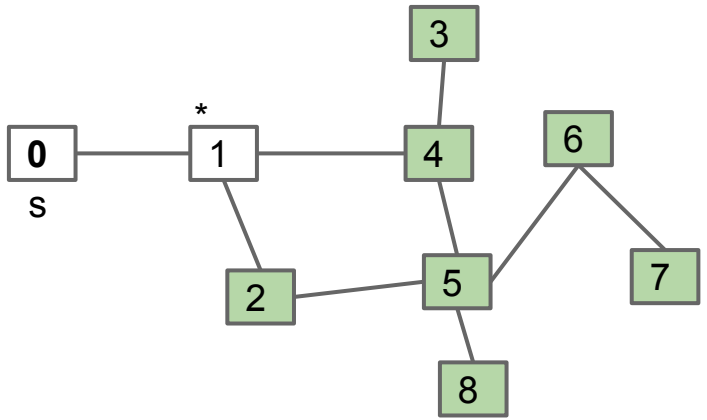
- Mark v.
- For each unmarked adjacent vertex w:
  - set edgeTo[w] = v.
  - dfs(w)

#	marked	edgeTo
0	T	-
1	T	0
2	F	1
3	F	-
4	F	-
5	F	-
6	F	-
7	F	-
8	F	-

dfs(1):
  mark(1).

  isMarked(0)? Yes.
  isMarked(2)?
  - edgeTo[2] = 1. **dfs(2).**

Order of dfs calls: 012



Order of dfs returns:

DepthFirstPaths Demo

Goal: Find a path from s to every other reachable vertex, visiting each vertex at most once. dfs(v) is as follows:

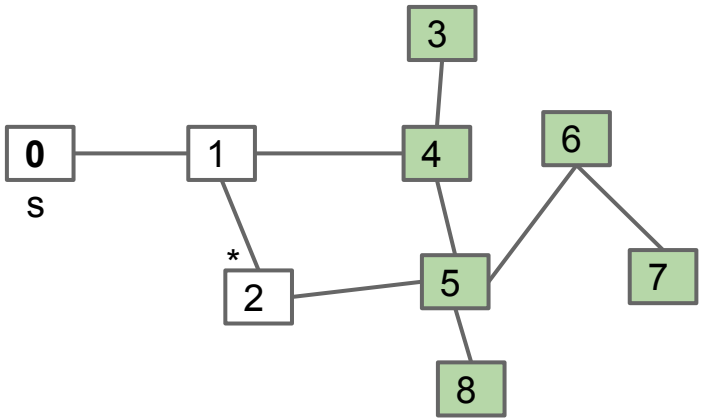
- Mark v.
- For each unmarked adjacent vertex w:
  - set edgeTo[w] = v.
  - dfs(w)

#	marked	edgeTo
0	T	-
1	T	0
2	T	1
3	F	-
4	F	-
5	F	2
6	F	-
7	F	-
8	F	-

dfs(2):
  mark(2).

  isMarked(1)? Yes.
  isMarked(5)?
  - edgeTo[5] = 2. **dfs(5).**

Order of dfs calls: 0125



Order of dfs returns:

DepthFirstPaths Demo

Goal: Find a path from s to every other reachable vertex, visiting each vertex at most once. dfs(v) is as follows:

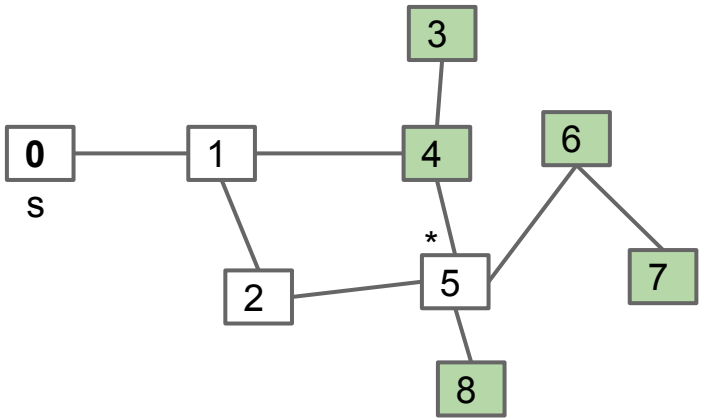
- Mark v.
- For each unmarked adjacent vertex w:
  - set edgeTo[w] = v.
  - dfs(w)

#	marked	edgeTo
0	T	-
1	T	0
2	T	1
3	F	-
4	F	5
5	T	2
6	F	-
7	F	-
8	F	-

dfs(5):
  mark(5).

  isMarked(2)? Yes.
  isMarked(4)?
  - edgeTo[4] = 5. **dfs(4).**

Order of dfs calls: 01254



Order of dfs returns:

DepthFirstPaths Demo

Goal: Find a path from s to every other reachable vertex, visiting each vertex at most once. dfs(v) is as follows:

- Mark v.
- For each unmarked adjacent vertex w:
  - set edgeTo[w] = v.
  - dfs(w)

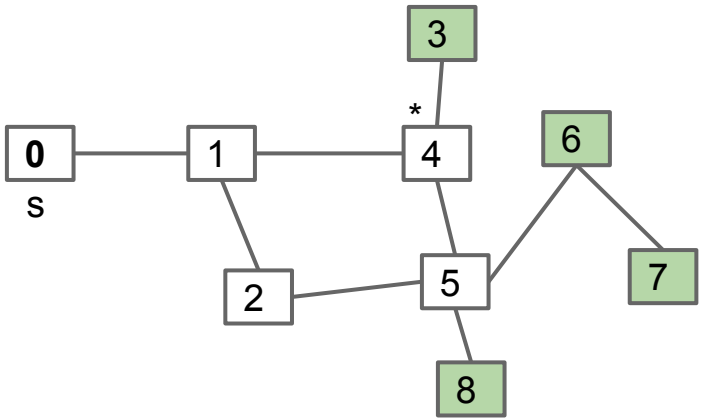
#	marked	edgeTo
0	T	-
1	T	0
2	T	1
3	F	4
4	T	5
5	T	2
6	F	-
7	F	-
8	F	-

dfs(4):
  mark(4).

  isMarked(1)? No.

  isMarked(3)? No.
  - edgeTo[3] = 4. **dfs(3).**

Order of dfs calls: 012543



Order of dfs returns:

DepthFirstPaths Demo

Goal: Find a path from s to every other reachable vertex, visiting each vertex at most once. dfs(v) is as follows:

- Mark v.
- For each unmarked adjacent vertex w:
  - set edgeTo[w] = v.
  - dfs(w)

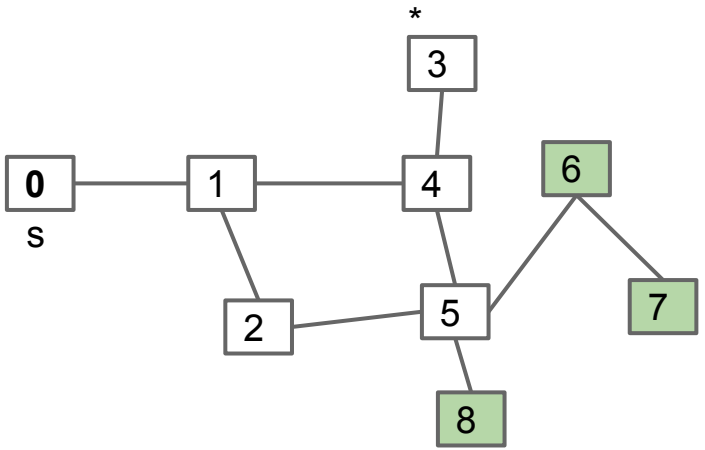
#	marked	edgeTo
0	T	-
1	T	0
2	T	1
3	T	4
4	T	5
5	T	2
6	F	-
7	F	-
8	F	-

dfs(3):
  mark(3).

  isMarked(4)? Yes.

  No more children! Return.

Order of dfs calls: 012543



Order of dfs returns: 3

DepthFirstPaths Demo

Goal: Find a path from s to every other reachable vertex, visiting each vertex at most once. dfs(v) is as follows:

- Mark v.
- For each unmarked adjacent vertex w:
  - set edgeTo[w] = v.
  - dfs(w)

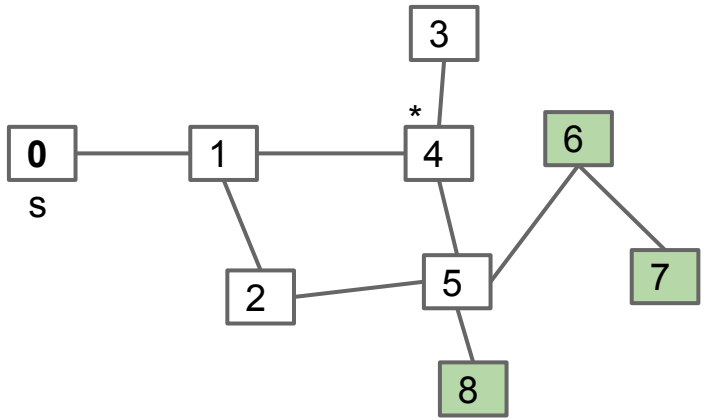
#	marked	edgeTo
0	T	-
1	T	0
2	T	1
3	T	4
4	T	5
5	T	2
6	F	-
7	F	-
8	F	-

dfs(4):
mark(4).

isMarked(3)? No.
- edgeTo[3] = 4. dfs(3).

No more children, return.

Order of dfs calls: 012543



Order of dfs returns: 34

DepthFirstPaths Demo

Goal: Find a path from s to every other reachable vertex, visiting each vertex at most once. dfs(v) is as follows:

- Mark v.
- For each unmarked adjacent vertex w:
  - set edgeTo[w] = v.
  - dfs(w)

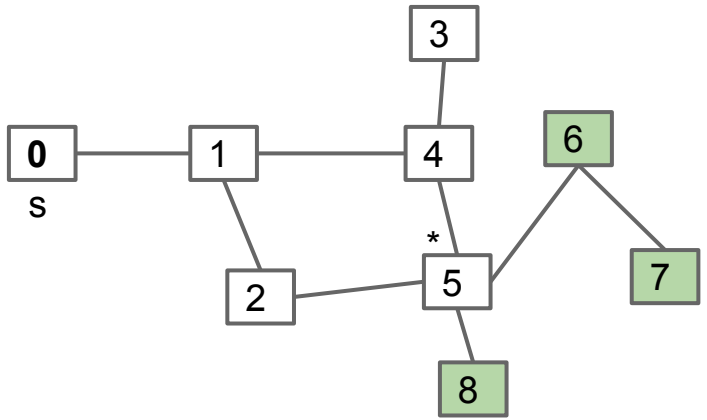
#	marked	edgeTo
0	T	-
1	T	0
2	T	1
3	T	4
4	T	5
5	T	2
6	F	5
7	F	-
8	F	-

dfs(5):
mark(5).

isMarked(2)? Yes.
isMarked(4)?
- edgeTo[3] = 4. dfs(4).

isMarked(6)?
- edgeTo[6] = 5. **dfs(6).**

Order of dfs calls: 0125436



Order of dfs returns: 34

DepthFirstPaths Demo

Goal: Find a path from s to every other reachable vertex, visiting each vertex at most once. dfs(v) is as follows:

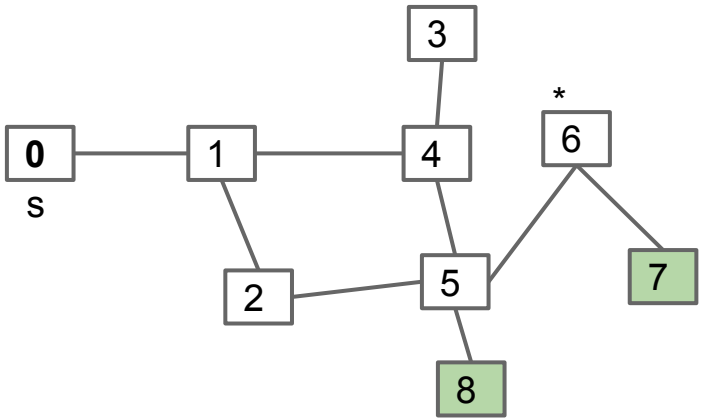
- Mark v.
- For each unmarked adjacent vertex w:
  - set edgeTo[w] = v.
  - dfs(w)

#	marked	edgeTo
0	T	-
1	T	0
2	T	1
3	T	4
4	T	5
5	T	2
6	T	5
7	F	6
8	F	-

dfs(6):
  mark(6).

  isMarked(5)? Yes.
  isMarked(7)? No.
  - edgeTo[7] = 6. **dfs(7).**

Order of dfs calls: 01254367



Order of dfs returns: 34

DepthFirstPaths Demo

Goal: Find a path from s to every other reachable vertex, visiting each vertex at most once. dfs(v) is as follows:

- Mark v.
- For each unmarked adjacent vertex w:
  - set edgeTo[w] = v.
  - dfs(w)

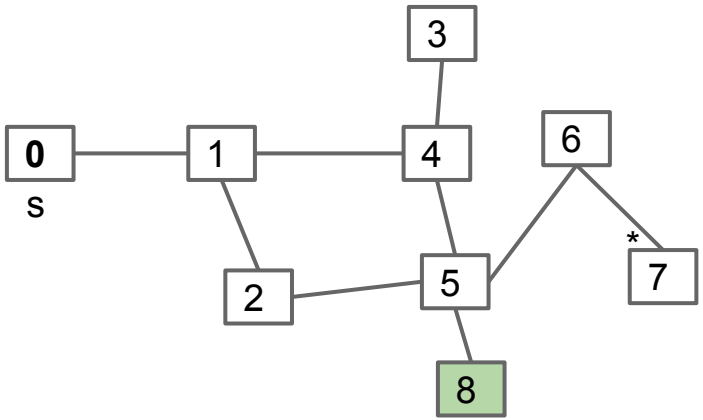
#	marked	edgeTo
0	T	-
1	T	0
2	T	1
3	T	4
4	T	5
5	T	2
6	T	5
7	T	6
8	F	-

dfs(7):
  mark(7).

  isMarked(6)? Yes.

  No more children, so return.

Order of dfs calls: 01254367



Order of dfs returns: 347

DepthFirstPaths Demo

Goal: Find a path from s to every other reachable vertex, visiting each vertex at most once. dfs(v) is as follows:

- Mark v.
- For each unmarked adjacent vertex w:
  - set edgeTo[w] = v.
  - dfs(w)

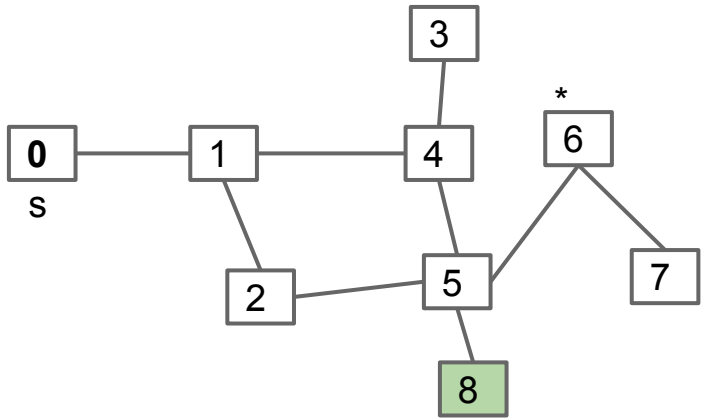
#	marked	edgeTo
0	T	-
1	T	0
2	T	1
3	T	4
4	T	5
5	T	2
6	T	5
7	T	6
8	F	-

dfs(6):
mark(6).

isMarked(5)? Yes.
isMarked(7)? No.
- edgeTo[7] = 6. dfs(7).

No more children so return.

Order of dfs calls: 01254367



Order of dfs returns: 3476

DepthFirstPaths Demo

Goal: Find a path from s to every other reachable vertex, visiting each vertex at most once. dfs(v) is as follows:

- Mark v.
- For each unmarked adjacent vertex w:
  - set edgeTo[w] = v.
  - dfs(w)

#	marked	edgeTo
0	T	-
1	T	0
2	T	1
3	T	4
4	T	5
5	T	2
6	T	5
7	T	6
8	F	5

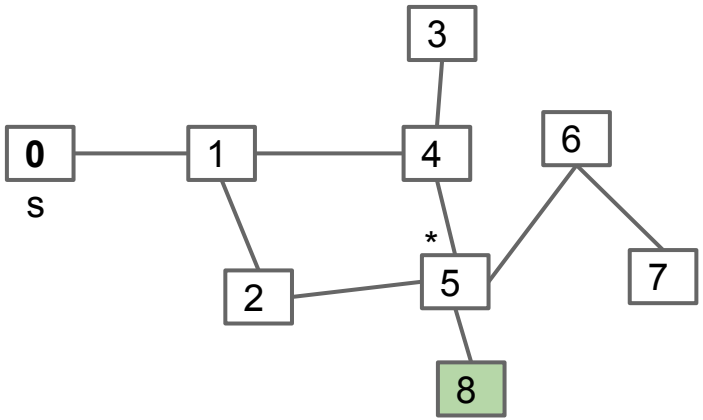
dfs(5):
mark(5).

isMarked(2)? Yes.
isMarked(4)?
- edgeTo[3] = 4. dfs(4).

isMarked(6)?
- edgeTo[6] = 5. dfs(6).

isMarked(8)? No.
- edgeTo[8] = 5. dfs(8)

Order of dfs calls: 012543678



Order of dfs returns: 3476

DepthFirstPaths Demo

Goal: Find a path from s to every other reachable vertex, visiting each vertex at most once. dfs(v) is as follows:

- Mark v.
- For each unmarked adjacent vertex w:
  - set edgeTo[w] = v.
  - dfs(w)

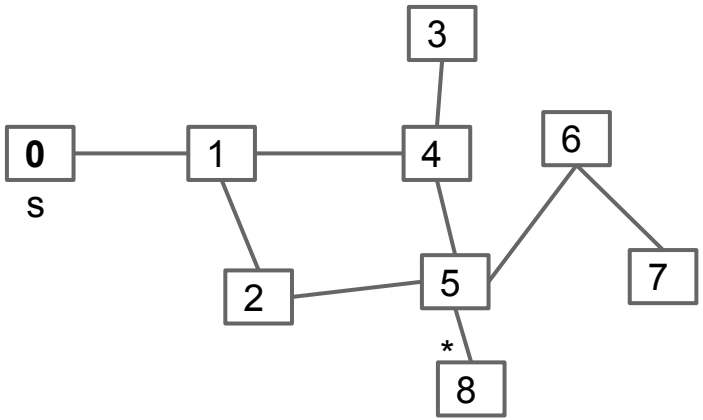
#	marked	edgeTo
0	T	-
1	T	0
2	T	1
3	T	4
4	T	5
5	T	2
6	T	5
7	T	6
8	T	5

dfs(8):
  mark(8)

  isMarked(5)? Yes.

  No more children, so return.

Order of dfs calls: 012543678



Order of dfs returns: 34768

DepthFirstPaths Demo

Goal: Find a path from s to every other reachable vertex, visiting each vertex at most once. dfs(v) is as follows:

- Mark v.
- For each unmarked adjacent vertex w:
  - set edgeTo[w] = v.
  - dfs(w)

#	marked	edgeTo
0	T	-
1	T	0
2	T	1
3	T	4
4	T	5
5	T	2
6	T	5
7	T	6
8	T	5

dfs(5):
mark(5).

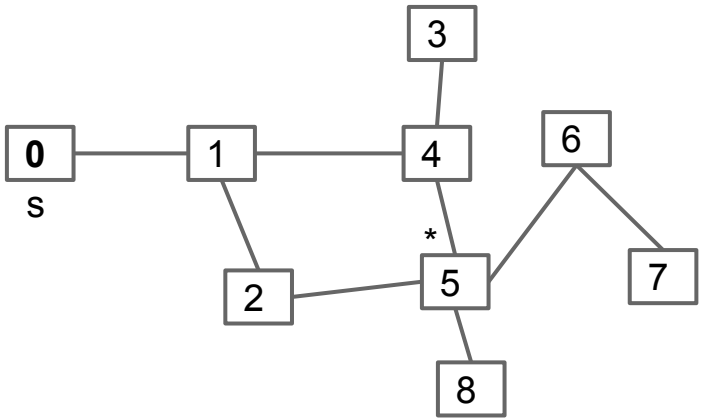
isMarked(2)? Yes.
isMarked(4)?
- edgeTo[3] = 4. dfs(4).

isMarked(6)?
- edgeTo[6] = 5. dfs(6).

isMarked(8)? No.
- edgeTo[8] = 5. dfs(8)

No more children, return.

Order of dfs calls: 012543678



Order of dfs returns: 347685

DepthFirstPaths Demo

Goal: Find a path from s to every other reachable vertex, visiting each vertex at most once. dfs(v) is as follows:

- Mark v.
- For each unmarked adjacent vertex w:
  - set edgeTo[w] = v.
  - dfs(w)

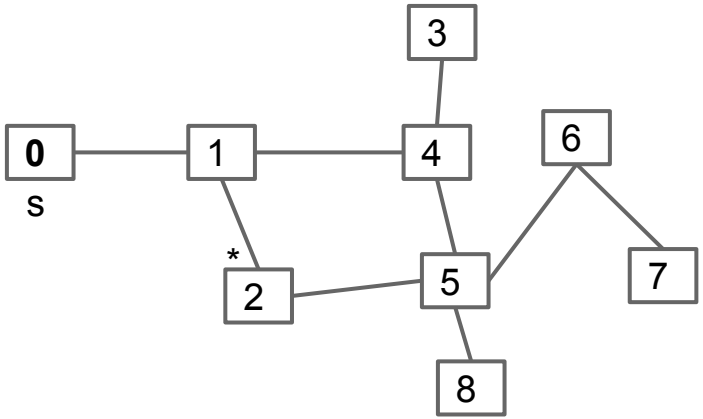
#	marked	edgeTo
0	T	-
1	T	0
2	T	1
3	T	4
4	T	5
5	T	2
6	T	5
7	T	6
8	T	5

dfs(2):
mark(2).

isMarked(1)? Yes.
isMarked(5)?
- edgeTo[5] = 2. dfs(5).

No more children, so return.

Order of dfs calls: 012543678



Order of dfs returns: 3476852

DepthFirstPaths Demo

Goal: Find a path from s to every other reachable vertex, visiting each vertex at most once. dfs(v) is as follows:

- Mark v.
- For each unmarked adjacent vertex w:
  - set edgeTo[w] = v.
  - dfs(w)

#	marked	edgeTo
0	T	-
1	T	0
2	T	1
3	T	4
4	T	5
5	T	2
6	T	5
7	T	6
8	T	5

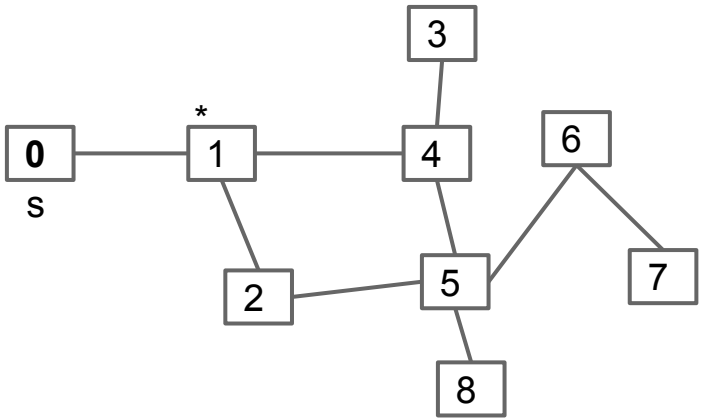
dfs(1):
mark(1).

isMarked(0)? Yes.
isMarked(2)?
- edgeTo[2] = 1. dfs(2).

isMarked(4)? Yes.

No more children, so return.

Order of dfs calls: 012543678



Order of dfs returns: 34768521

DepthFirstPaths Demo

Goal: Find a path from s to every other reachable vertex, visiting each vertex at most once. dfs(v) is as follows:

- Mark v.
- For each unmarked adjacent vertex w:
  - set edgeTo[w] = v.
  - dfs(w)

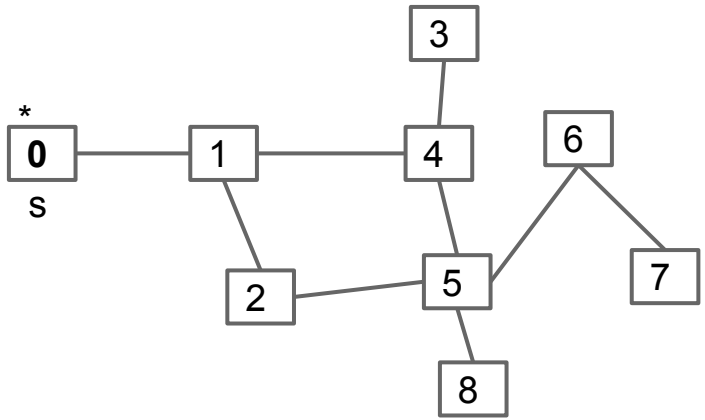
#	marked	edgeTo
0	T	-
1	T	0
2	T	1
3	T	4
4	T	5
5	T	2
6	T	5
7	T	6
8	T	5

dfs(0):
mark(0).

isMarked(1)? No.
- edgeTo[1] = 0. dfs(1).

No more children, so return.

Order of dfs calls: 012543678



Order of dfs returns: 347685210