

Unit 11 - Week 9

Course outline

How does an NPTEL online course work?

Week 0

Week 1

Week 2

Week 3

Week 4

Week 5

Week 6

Week 7

Week 8

Week 9

Lecture 41: BFS & DFS

Lecture 42: Shortest path problem

Lecture 43: Dijkstra's

Lecture 44: Example of Dijkstra

Lecture 45: Bellman Ford

Week 9 : Lecture Notes

Quiz : Assignment 9

Week 9 Feedback Form

Week 10

Week 11

Week 12

[Details Solution](#)

[Download videos](#)

[Text Transcripts](#)

Assignment 9

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2020-04-01, 23:59 IST.

1) Which of the following is the most commonly used data structure for implementing Dijkstras Algorithm?

1 point

- (a) Max priority queue
- (b) Stack
- (c) Circular queue
- (d) Min priority queue

- a.
 b.
 c.
 d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
d.

2) Is the following statement true?

1 point

A DFS of a directed graph always produces the same number of tree edges, i.e. independent of the order in which the vertices are considered for DFS.

- (a) Yes
- (b) No

- a.
 b.

No, the answer is incorrect.
Score: 0

Accepted Answers:
b.

3) Which of the following are the properties of Shortest path?

1 point

- (a) Triangle inequality For all $(u, v) \in E$, we have $\delta(s, v) \leq \delta(s, u) + w(u, v)$.
- (b) Upper-bound property: If $d[v] \geq \delta(s, v) \forall v$. then $d[v] = \delta(s, v)$,
- (c) No-path property: If $\delta(s, v) = \infty$, then $d[v] = \infty$ always.
- (d) All of these

- a.
 b.
 c.
 d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
d.

4) What is running time of Dijkstras algorithm using Binary min- heap method?

1 point

- (a) $\mathcal{O}(|V|)$
- (b) $\mathcal{O}(|V|\log|V|)$
- (c) $\mathcal{O}(|E|)$
- (d) $\mathcal{O}(|E|\log|V|)$

- a.
 b.
 c.
 d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
d.

5) How many times the for loop in the Bellmann Ford Algorithm gets executed?

1 point

- (a) V times
- (b) $V - 1$ times
- (c) E times
- (d) $E - 1$ times

- a.
 b.
 c.
 d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
b.

6) Which of the following can be solved using BFS

1 point

- (a) Testing wheather the graph is connected.
- (b) Computing a spanning forest of the graph.
- (c) Computing a cycle in a graph or reporting that no such such cycle exist.
- (d) All of these above.

- a.
 b.
 c.
 d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
d.

7) In a weighted graph, assume that the shortest path from a source s to a destination t is correctly calculated using a shortest path algorithm. Is the following statement true?
"If we increase weight of every edge by 1, the shortest path always remains same."

1 point

- (a) Yes
- (b) No

- a.
 b.

No, the answer is incorrect.
Score: 0

Accepted Answers:
b.

8) Which of the following statements are true

1 point

Statement1: A subpath of a shortest path is a shortest path.
Statement2: If a graph G contains a negative weight cycle, then some shortest path may not be exist.

- (a) Statement 1 is true but 2 is false
- (b) Statement 1 is false but 2 is true
- (c) Both are true

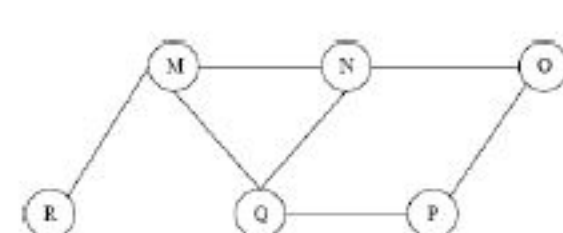
- a.
 b.
 c.

No, the answer is incorrect.
Score: 0

Accepted Answers:
c.

9) The Breadth First Search algorithm has been implemented using the queue data structure. One possible order of visiting the nodes of the following graph is

1 point



- (a) MNOPQR
- (b) NQMPOR
- (c) QMNPOR
- (d) QMNPOR

- a.
 b.
 c.
 d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
c.

10) In DFS, if (u, v) is an edge which connects two node such that they do not have any ancestor and a descendant relationship between them, than the edge is called

1 point

- (a) Tree edge
- (b) Back edge
- (c) Forward edge
- (d) Cross edge

- a.
 b.
 c.
 d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
d.