



Started on	Thursday, 25 May 2023, 10:52 PM
State	Finished
Completed on	Thursday, 25 May 2023, 11:18 PM
Time taken	26 mins 20 secs
Grade	8.50 out of 10.00 (85%)

Question 1

Correct

Mark 1.00 out of 1.00

In the Bellman-Ford algorithm, how many iterations are required to find the shortest path in a graph with V vertices and E edges?

Select one:

- ☒ a. $V - 1$ ✓
- ☐ b. $E - 1$
- ☐ c. V
- ☐ d. E

Your answer is correct.

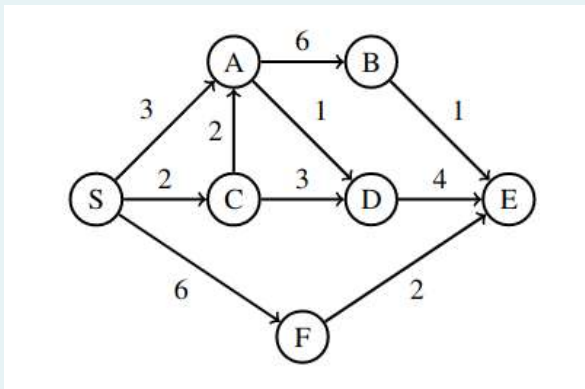
The correct answer is: $V - 1$

Question 2

Correct

Mark 1.00 out of 1.00

Run Dijkstra's algorithm on the following directed graph, starting at vertex S. What is the order in which vertices get removed from the priority queue?



Select one:

- ☐ a. B, A, C, F, D, E, S
- ☐ b. F, S, A, C, D, E, B
- ☐ c. S, A, C, F, D, E, B
- ☒ d. S, C, A, D, F, E, B ✓

Your answer is correct.

The correct answer is: S, C, A, D, F, E, B

Question 3

Correct

Mark 1.00 out of 1.00

Which of the following statements are correct regarding shortest paths in graphs?

- ☐ a. Edges with negative weights reachable from the source are not acceptable in shortest path trees
- ☐ b. Cycles with negative weights reachable from the source are acceptable in shortest path trees
- ☒ c. A shortest path can not contain cycles ✓
- ☒ d. All subpaths of a shortest path are shortest paths as well ✓

Your answer is correct.

The correct answers are:

A shortest path can not contain cycles,

All subpaths of a shortest path are shortest paths as well

Question 4

Correct

Mark 1.00 out of 1.00

If all the edge weights of a graph are positive, it is possible to have a cycle in the shortest path between some 2 vertices

Select one:

- ☐ True
- ☒ False ✓

The correct answer is 'False'.

Question 5

Correct

Mark 1.00 out of 1.00

Which algorithm is used to solve the single-source shortest path problem in a graph with negative edge weights?

Select one:

- ☐ a. Kruskal's algorithm
- ☐ b. Prim's algorithm
- ☒ c. Bellman-Ford algorithm ✓
- ☐ d. Dijkstra's algorithm

Your answer is correct.

The correct answer is: Bellman-Ford algorithm

Question 6

Correct

Mark 1.00 out of 1.00

Which of the following data structures is typically used in the implementation of Dijkstra's algorithm?

Select one:

- ☐ a. Stack
- ☐ b. Queue
- ☐ c. Hash table
- ☒ d. Priority queue ✓

Your answer is correct.

The correct answer is: Priority queue

Question 7

Correct

Mark 1.00 out of 1.00

For what cases can we apply Bellmann Ford algorithm?

Select one or more:

- ☐ a. Undirected and unweighted graphs
- ☐ b. Undirected and weighted graphs
- ☒ c. All directed graphs ✖
- ☒ d. Directed and weighted graphs ✔

Your answer is correct.

The correct answer is: Directed and weighted graphs

Question 8

Incorrect

Mark 0.00 out of 1.00

A graph can have a negative weight cycle when?

Select one:

- ☐ a. The graph has 1 or more negative weighted edges
- ☐ b. The graph has 1 negative weighted edge
- ☒ c. The graph has a cycle ✖
- ☐ d. The total weight of the graph is negative

Your answer is incorrect.

When the total weight of the graph sums up to a negative number then the graph is said to have a negative weight cycle. Bellmann Ford Algorithm provides no solution for such graphs.

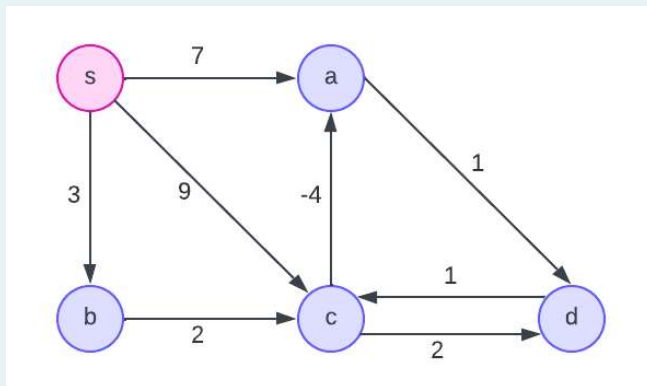
The correct answer is: The total weight of the graph is negative

Question 9

Correct

Mark 1.00 out of 1.00

What is the weight of the shortest path from source s to d in the following graph?



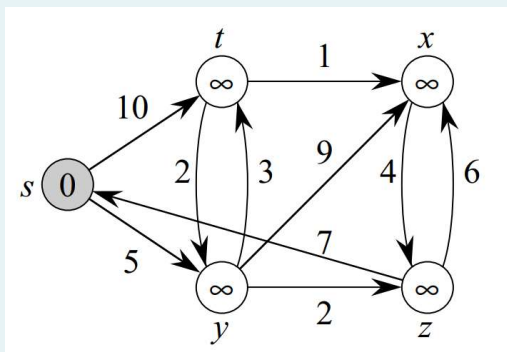
Answer: ✓

The correct answer is: 2

Question 10

Partially correct

Mark 0.50 out of 1.00



Suppose we execute the first iteration of Bellman ford algorithm for the above graph. Take s as the source vertex. Recall that the order we process the edges inside an iteration can result in different results in intermediate iterations.

What can be a possible value at node x after 1st iteration? (i.e. iterating over all the edges 1 time)

Select one or more:

- ☐ a. 0
- ☒ b. 13 ✓
- ☐ c. Infinity
- ☐ d. 10

Your answer is partially correct.

You have correctly selected 1.

The correct answers are:

13,

Infinity