Unit 12 - Week 10

Course outline

How does an NPTEL online course work?

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- Lecture 46: Correctness of Bellman Ford
- Lecture 47: Application of Bellman Ford
- Lecture 48: All pairs shortest path
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Assignment 10

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

Due on 2020-04-08, 23:59 IST.

1) Which of the following statement are true ? *1 point*

Statement 1: If the constraint graph contains negetive weight cycle, then the system of differences in not unsatisfiable.
Statement 2: If no negetive weight cycle exists in the constraint graph, then the constraints are satisfiable.

(a) only Statement 1
(b) only Statement 2
(c) Both Statement 1 and Statement 2

a.
b.
c.

No, the answer is incorrect.
Score: 0
Accepted Answers:
b.

2) In Dense graph G=(V,E,) what is the run of Bellmen Ford Algorithm for solving All pair Shortest Path algorithm? *1 point*

(a) $\mathcal{O}(|V|^2)$
(b) $\mathcal{O}(|V|^3)$
(c) $\mathcal{O}(|V|^4)$
(d) $\mathcal{O}(|V|)$

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
c.

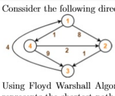
3) What is the formula to compute the transitive closure of a graph? *1 point*

(a) $t_{ij}^{(k)} = t_{ij}^{(k-1)}$ AND $(t_{ik}^{(k-1)} \text{OR } t_{kj}^{(k-1)})$
(b) $t_{ij}^{(k)} = t_{ij}^{(k-1)}$ OR $(t_{ik}^{(k-1)} \text{AND } t_{kj}^{(k-1)})$
(c) $t_{ij}^{(k)} = t_{ij}^{(k-1)}$ AND $(t_{ik}^{(k-1)}$ AND $t_{kj}^{(k-1)})$
(d) $t_{ij}^{(k)} = t_{ij}^{(k-1)}$ OR $(t_{ik}^{(k-1)} \text{OR } t_{kj}^{(k-1)})$

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
b.

4) Consider the following directed graph *1 point*



Using Floyd Warshall Algorithm and find which of following matrix represents the shortest path distance between every pair of vertices.

(a) $\begin{bmatrix} 0 & 3 & 4 & 1 \\ 5 & 0 & 1 & 6 \\ 4 & 7 & 0 & 5 \\ 7 & 2 & 3 & 0 \end{bmatrix}$

(b) $\begin{bmatrix} 0 & 3 & -9 & 1 \\ 5 & 0 & 4 & 6 \\ 4 & 7 & 0 & 5 \\ 7 & 2 & 3 & 1 \end{bmatrix}$

(c) $\begin{bmatrix} 0 & 3 & 9 & 1 \\ 5 & 0 & 4 & 6 \\ 2 & 3 & 1 & 5 \\ 7 & 2 & 3 & 0 \end{bmatrix}$

(d) $\begin{bmatrix} 1 & 3 & -4 & 1 \\ 5 & 0 & 4 & 6 \\ 4 & 7 & 0 & 5 \\ 7 & 2 & 3 & 0 \end{bmatrix}$

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
a.

5) Consider the following statement "Johnson Algorithm works by using the BellmanFord algorithm to compute a transformation of the input graph that removes all negative weights, allowing Dijkstra's algorithm to be used on the transformed graph". The statement is *1 point*

(a) True
(b) False

a.
b.

No, the answer is incorrect.
Score: 0
Accepted Answers:
a.

6) What is the run time of Johnson algorithm in worst case *1 point*

(a) $\mathcal{O}(|V||E| + |V|^2 log|V|)$
(b) $\mathcal{O}(|E| + |V| log|V|)$
(c) $\mathcal{O}(|V||E|)$
(d) $\mathcal{O}(|V|^2)$

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
a.

7) What happens in $d_{ij}^{(k)}$,when the value of k is 0 in the Floyd Warshall Algorithm? *1 point*

(a) 1 intermediate vertex
(b) 0 intermediate vertex
(c) N intermediate vertices
(d) N-1 intermediate vertices

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
b.

8) Bellmann Ford Algorithm is an example for *1 point*

(a) Dynamic Programming
(b) Greedy Algorithms
(c) Linear Programming
(d) Branch and Bound

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
a.

9) The running time of Bellman ford algorithm is lower than that of Dijkstra's Algorithm *1 point*

(a) True
(b) False

a.
b.

No, the answer is incorrect.
Score: 0
Accepted Answers:
b.

10) Given a system of difference constrints, let G=(V,E) be the corrosponding constraint graph. If G has a negetive weight cycle, than the system of contraints has *1 point*

(a) Unique solution.
(b) infinite nunmer of solution
(c) No feasible solution.
(d) Exactly two solution exist

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
c.