CSE220: Data Structures (Lab)

Fall 2024

Lab Quiz - 07

Duration: 30 Minutes

| Name: | ID: | Section: |
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### **Question 1 [15 Points]**

Given a directed weighted graph, a starting vertex *s* and total available points *p*, traverse the graph, always choosing the outgoing edge with the **minimum weight at each step**. When traversing an edge with weight *w*, expend *w* points from total available points.

**Determine the last vertex** you can reach from *s* before running out of points. If you reach a **dead end (no outgoing edges)** before using all your points, that vertex is the last reachable vertex.   
**Note:** You can solve using either adjacency matrix or adjacency list. Assume that the **Graph** is already created.

| **Given Graph & Sample Input** | **Sample Output** |
| --- | --- |
| graph =  s = 0  p = 13  **findMinPath( graph, s, p )**  **Here, the “graph” parameter is a square Matrix if you’re using the Adjacency Matrix. Otherwise, it is an array of singly Nodes if you’re using Adjacency List.** | Last reachable vertex = 0 |
| **Explanation:** |
| Choosing min weight edge from the  starting point s = 0,  i) vertex 0 → vertex 3  cost = 2, points available = 13-2 = 11  ii) vertex 3 → vertex 2  cost = 4, points available = 11-4 = 7  iii) vertex 2 → vertex 1  cost = 6, points available = 7-6 = 1  iv) vertex 1 -> vertex 0  cost = 1, points available = 1-1 = 0  Cannot go any further with available  points.  Therefore, last reachable vertex = 0 |