

CMSC 132 Quiz 5 Worksheet

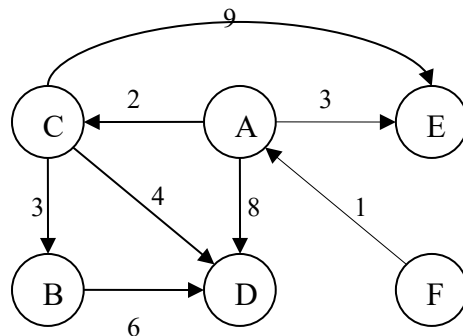
The next quiz for the course will be on Mon, Dec 2. The following list provides additional information about the quiz:

- The quiz will be a written quiz (no computer).
- The quiz will be in lab.
- Closed book, closed notes quiz.
- Answers must be neat and legible.
- Quiz instructions can be found at <http://www.cs.umd.edu/~nelson/classes/utilities/examRules.html>

The following exercises cover the material to be included in this quiz. Solutions to these exercises will not be provided, but you are welcome to discuss your solutions with the TAs or instructors during office hours. **There are no coding questions associated with the quiz.**

Graph Problem I

Use the following graph to answer the questions below.



1. Give a possible order in which the nodes of this graph could be visited in performing a **Breadth First Search (BFS)** starting at vertex **F**. Pick nodes to visit using alphabetical order (when multiple choices are possible).
2. Give a possible order in which the nodes of this graph could be visited in performing a **Depth First Search (DFS)** starting at vertex **F**. Pick nodes to visit using alphabetical order (when multiple choices are possible).
3. Apply Dijkstra's algorithm using **A** as the starting (source) node. Indicate the cost and predecessor for each node in the graph after processing 2 nodes (**A** and another node). Remember to update the appropriate table entries after processing the 2nd node (after it has been added to the set of processed nodes). An empty table entry implies an infinite cost or no predecessor. *Note: do not simply fill in the entire table with the final costs and predecessors instead of showing the table at the first two steps.*

After processing 1 node:

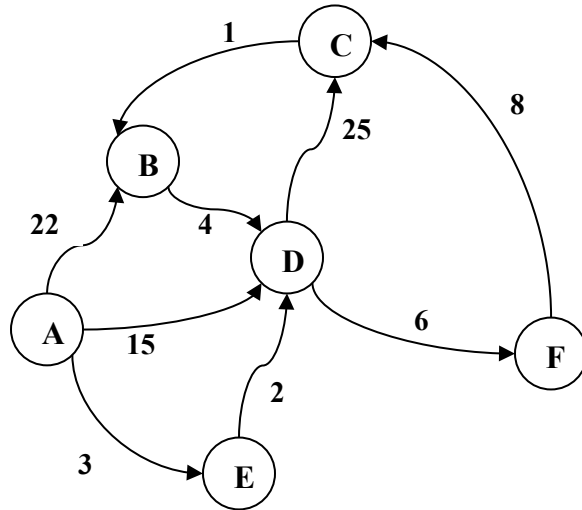
Node	A	B	C	D	E	F
Cost						
Predecessor						

After processing 2 nodes:

Node	A	B	C	D	E	F
Cost						
Predecessor						

Graph Problem II

Use the following graph for the questions below.



1. **DFS/BFS**

2

For each of the following exercises, specify the order nodes are visited when performing the appropriate traversal. Pick nodes to visit using alphabetical order (when multiple choices are possible).

- Apply DFS with A as the start node.
- Apply DFS with C as the start node (assuming edges are undirected).
- Apply BFS with D as the start node.
- Apply BFS with F as the start node (assuming edges are undirected).

2. **Single Source Shortest Path**

For each of the following exercises, assume that all edges in the above graph are undirected.

- Apply Dijkstra's algorithm with A as the start node. List shortest path to F.
- Apply Dijkstra's algorithm with B as the start node. List shortest path to F.
- Apply Dijkstra's algorithm with E as the start node. List shortest path to C.

Graph Problem III

Previous quiz:

<http://www.cs.umd.edu/class/fall2019/cmsc132/quizzes/Quiz5Fall2015.pdf>

<http://www.cs.umd.edu/class/fall2019/cmsc132/quizzes/Quiz5Fall2015Key.pdf>