

University of Nevada, Las Vegas Computer Science 477/677 Fall 2023

Assignment 5: Due Saturday October 21, 2023, 11:59 PM

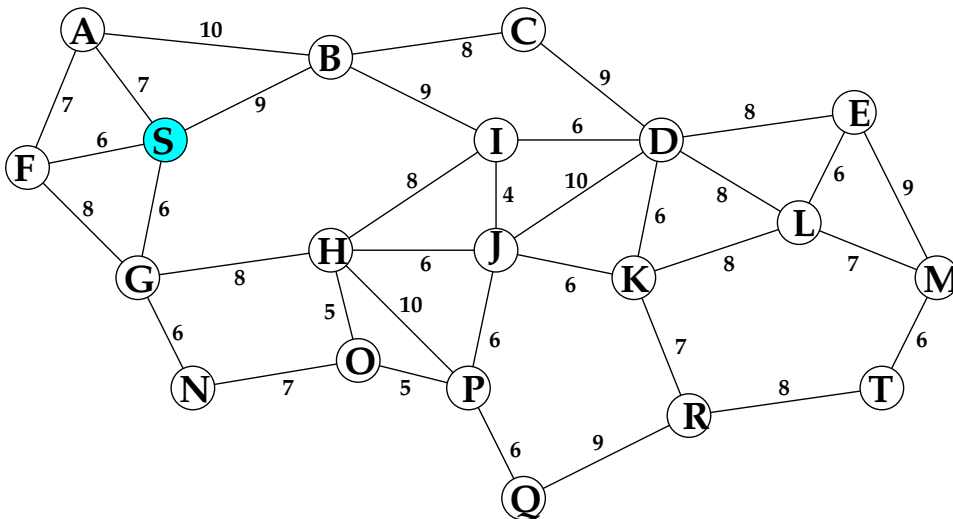
Name: \_\_\_\_\_

You are permitted to work in groups, get help from others, read books, and use the internet. Turn the assignment in to Canvas, following the instructions given to you by Sabrina Wallace.

1. Walk through Dijkstra's algorithm for the single source minpath problem for the directed graph illustrated below. Instead of numbering the vertices 0 through 19, I have assigned them letters from A to T. The source vertex is S.

After each iteration of the main loop, show

1. The array dist, where  $\text{dist}[x]$  is the smallest length of any path found so far from S to x. (Initially,  $\text{dist}[x] = \infty$  for most x.)
2. The array back, where  $\text{back}[x]$  is the next-to-the last vertex on the path of smallest weight found so far from S to x.
- 3 The contents of heap. Do not try to show the structure of the heap, simply list its members.



Continue your work on Problem 1 on this page.

2. Work problems 2, 3, 4, 6 and 7 of the complex number assignment, cmplxhw1.pdf.