SA367 · Mathematical Models for Decision Making   Spring 2022 · Uhan

Quiz 7 – 3/24/2022

Instructions. You have 15 minutes to complete this quiz. You may <u>not</u> use any other materials (e.g., notes, homework, website).

<u>Show all your work.</u> To receive full credit, your solutions must be completely correct, sufficiently justified, and easy to follow.

Problem	Weight	Score
1a	1	
1b	1	
1c	1	
1d	1	
Total		/ 40

Problem 1. Consider the following directed graph. The edge labels correspond to edge lengths.
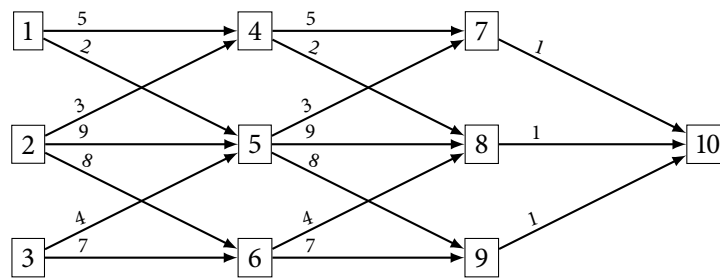
Let $f(i)$ be the length of a shortest path from node i to node 10 in the directed graph above.

Using the principle of optimality and recursion, we can solve for the values of $f(i)$. Fill in the blanks below.

a. $f(10) = \boxed{}$

b. $f(9) = \min\left\{ \boxed{} + f\left(\boxed{} \right) \right\} = \boxed{}$

  $f(8) = 1$
  $f(7) = 1$
  $f(6) = 5$

c. $f(5) = \min\left\{ \boxed{} + f\left(\boxed{} \right), \boxed{} + f\left(\boxed{} \right), \boxed{} + f\left(\boxed{} \right) \right\} = \boxed{}$

  $f(4) = 3$
  $f(3) = 8$
  $f(2) = 6$

d. $f(1) = \min\left\{ \boxed{} + f\left(\boxed{} \right), \boxed{} + f\left(\boxed{} \right) \right\} = \boxed{}$

See Problem 1 in Lesson 10 for hints on how to approach this problem.