CS 61BL Summer 2019

Lab 17

August 01, 2019

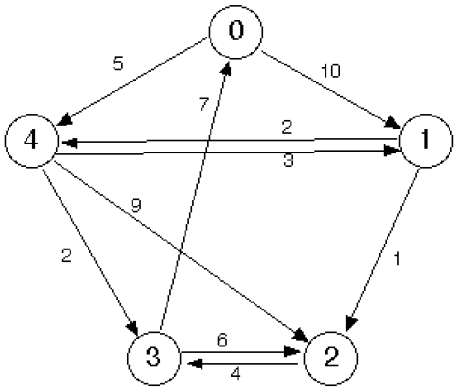
Name: SID:

Please complete this worksheet during your lab, and turn it in to your TA by the end of your section. You are encouraged to work with your neighbors collaboratively.

Section Number: 01 02 03 04 05 06 07 08 09 10 11 12

1 Shortest Path

1.1 Suppose that the weight of an edge represents the distance along a road between the corresponding vertices. The weight of a path would then be the sum of the weights on its edges. Use the graph below to answer the following questions.



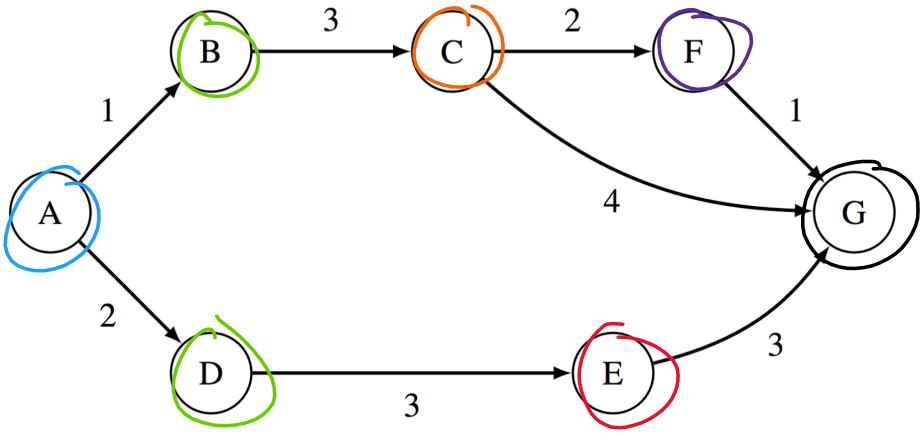
What is the shortest path that connects vertex 0 with vertex 2? Write your answer as a space separated list of numbers.

What is the shortest path that connects vertex 2 with vertex 1? Write your answer as a space-separated list of numbers.

What is the shortest path that connects vertex 1 with vertex 0? Write your answer as a space-separated list of numbers.

2 Dijkstra's Algorithm

For the graph below, let `g(u, v)` be the weight of the edge between any nodes `u` and `v`. Let `h(u, v)` be the value returned by the heuristic for any nodes `u` and `v`.



2.1 Run Dijkstra's algorithm to find the shortest paths from A to every other vertex. You may find it helpful to keep track of the priority queue and make a table of current distances.

Vertex	Shortest path from A	Weight of path
B	A ✓	∞ 1 ✓
C	B ✓	∞ 4 ✓
D	A ✓	∞ 2 ✓
E	D ✓	∞ 5 ✓
F	C ✓	∞ 6 ✓
G	~~E~~ F ✓	∞ ~~8~~ 7 ✓
A	A ✓	0 ✓

A → B : AB
A → D : AD
A → C : ABC
A → E : ADE
A → F : ABCF
A → G : ABCFG