Homework 7

CS 5700

1. (20 points)
   Using the example network given below, give the virtual circuit tables for all the switches after the following connections is established.

   Assume that the sequence of connections is cumulative; that is, the first connection is still up when the second connection is established, and so on. Also assume that the VCI assignment always picks the lowest unused VCI on each link, starting with 0, and that a VCI is consumed for both directions of a virtual circuit.

   For each question, provide the switches in numerical order from top to bottom.
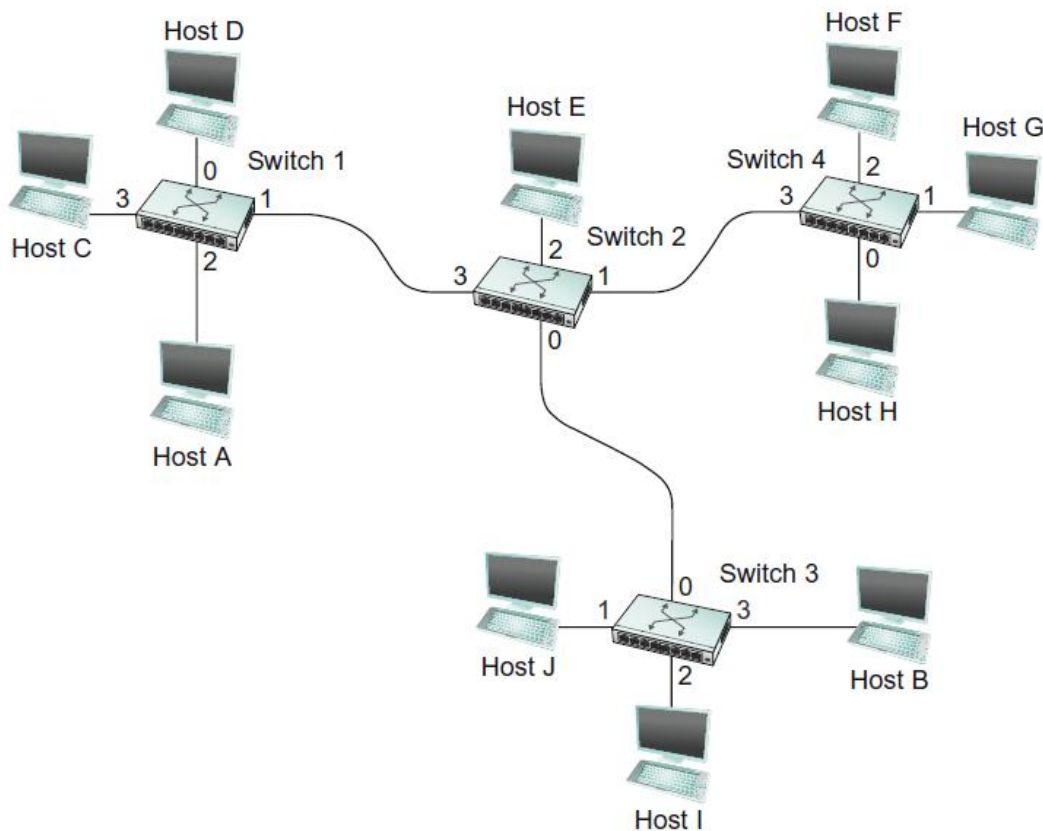
   a. Host B connects to host D.
   b. Host B connects to host E.

a.

Switch	Input Port	Input VCI	Output Port	Output VCI
1	1	0	0	0
2	0	0	3	0
3	3	0	0	0

b.

Switch	Input Port	Input VCI	Output Port	Output VCI
2	0	1	2	0
3	3	1	0	1

2. (20 points)
Perform Dijkstra's algorithm on the below network topology. Assume node a is the source node. Your solution should be a table containing the following columns: Node, Shortest Distance from Node a, and Previous Node.

In addition, so that I can see your work, when replacing a column's value, cross out the previous iteration's value, do not delete it. If you do not do this, you'll get a lot of points deducted, no exceptions.

If there is a tie in distance weights, choose the earliest alphabet to break the tie (e.g. a is an earlier alphabet than b, e is an earlier alphabet than g, etc.).
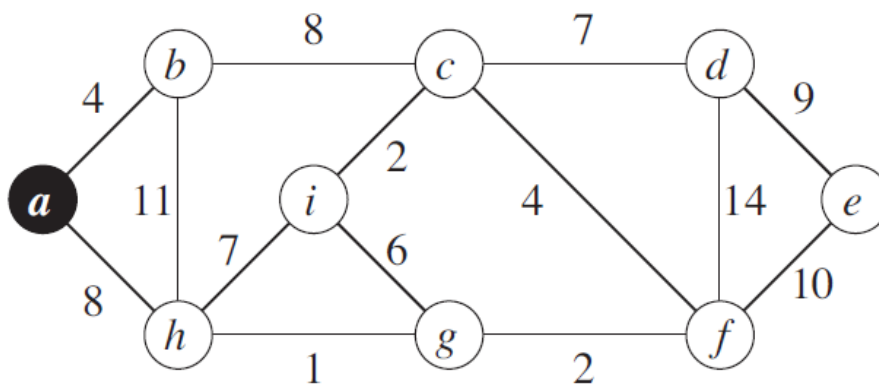
Node	Shortest Distance		Previous Node	
a	~~infinity~~	0	NULL	
b	~~infinity~~	4	~~NULL~~	a
c	~~infinity~~	12	~~NULL~~	b
d	~~infinity~~ ~~25~~	19	~~NULL~~ ~~f~~	c
e	~~infinity~~	21	~~NULL~~	f
f	~~infinity~~	11	~~NULL~~	g
g	~~infinity~~	9	~~NULL~~	h
h	~~infinity~~	8	~~NULL~~	a
i	~~infinity~~ ~~15~~	14	~~NULL~~ ~~h~~	c