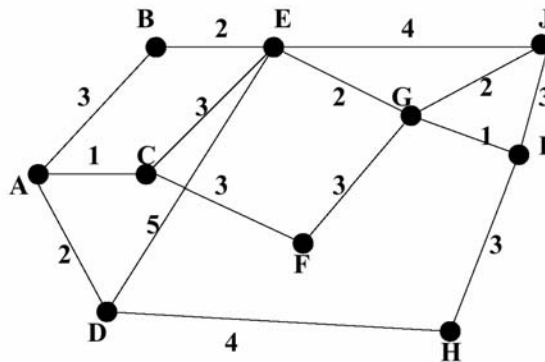


The University of Queensland
 School of Information Technology and Electrical Engineering
 Semester Two, 2011

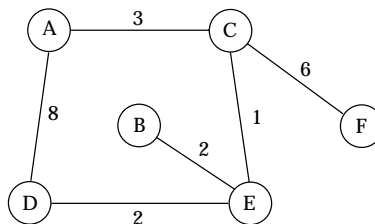
COMS3200 – Tutorial 9

Questions

1. Assuming that all routers and hosts are working properly and that all the software in both is free of all errors, is there any chance, however small, that a packet will be delivered to the wrong destination? Explain your answer.
2. Give a simple algorithm for finding two paths through a network from a given source to a given destination that can survive the loss of *any* communication line. The routers are considered reliable enough, so it is not necessary to worry about the possibility of router crashes.
3. Given the network below and using the metrics shown on the links as the basis for optimality, sketch the shortest path from A to J using Dijkstra's algorithm. Show the spanning tree rooted at A (make sure your sketch clearly shows which links are on the tree and which are not). The metrics are the same in each direction on the link.



4. (PD 4.12) For the network shown below, give the distance-vector routing tables for each node (i.e. destination, cost, next hop) when:
 - (a) Each node knows only the distances to its immediate neighbours
 - (b) Each node has reported the information it had in the preceding step to its immediate neighbours
 - (c) Step (b) happens a second time.



5. (PD 4.13) For the same network, use Dijkstra's algorithm to generate the spanning tree rooted at node D. What will the routing table for D look like?
6. (PD4.15) For the same network, suppose the forwarding tables are all established as in Q4 and then the C-E link fails. Give
 - (a) the tables of A, B, D and F after C and E have reported the news

(b) the tables of A and D after their next mutual exchange

(c) the table of C after A exchanges with it

7. (PD4.14) Suppose we have the forwarding tables shown below for nodes A and F in a network where all links have cost 1. Give a diagram of the smallest network consistent with these tables:

A

Node	Cost	Nexthop
B	1	B
C	2	B
D	1	D
E	2	B
F	3	D

F

Node	Cost	Nexthop
A	3	E
B	2	C
C	1	C
D	2	E
E	1	E