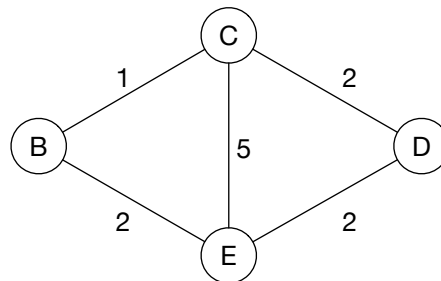


6 Computer Networking (EK)

- (a) Briefly describe the main differences and similarities between routers and switches. [4 marks]
- (b) Consider the network shown in the figure below with four nodes. Cost links are shown in the diagram. Give the distance-vector routing tables for node C in the following two consecutive steps.
- (i) Step 0: C knows the distances to its immediate neighbours and [1 mark]
- (ii) Step 1: information from step 0 is exchanged as per the distance-vector algorithm. [3 marks]



- (c) (i) What is the problem that the Karn-Partridge algorithm aims to solve? [2 marks]
- (ii) Karn and Partridge proposed the use of exponential backoff in the TCP timeout value. Why is it that an exponential increase in the timeout value is more efficient than a linear increase for example? [2 marks]
- (d) What is the difference between congestion control and flow control in TCP? [2 marks]
- (e) Assume that three TCP flows f_1 , f_2 , f_3 , share a single link. The bandwidth of the link is 200 Mbps. The desired bandwidth of each flow is: f_1 60 Mbps, f_2 80 Mbps, and f_3 100 Mbps.
- (i) What would be the max-min bandwidth allocation of the flows? [2 marks]
- (ii) Propose a way to “cheat” max-min fairness so that f_3 increases its allocated bandwidth as computed in Part (e)(i). [4 marks]