Principles of Internetworking Protocols

Assignment Seven (20 marks)
(Due on April 28)

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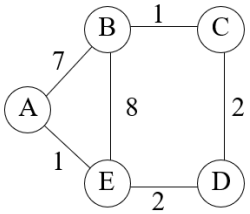
Instructions:

1. Submit a pdf file for your answers to i-Learning before 11:59 on April 28. Put down your name, student ID and program/year in your submission.
2. Late submission will not be accepted.
3. Observe also the penalty for plagiarism as stated in the Course Overview slides.

Question 1: A toy example for distance-vector routing protocol

[10 MARKS] In the class we consider a network of 5 routers on the left hand side of Figure 1. The routers are running a distance-vector routing protocol among themselves. After the routing protocol converges, we obtain all the possible scenarios from router E to go to the other routers. The table on the right hand side of Figure 1 shows the distances for these scenarios. The numbers in boldface are the shortest distances for the destinations. Please show similar tables for the other four routers.



After convergence, at router E:

Dest \ Via	A	B	D
A	**1**	14	5
B	7	8	**5**
C	6	9	**4**
D	4	11	**2**

Figure 1: A network of five routers running a distance-vector routing protocol among themselves, and a table of distances for router E to reach other routers.

Question 2: Tracing the evolution of the distance routing protocol

[10 MARKS] Going back to the 5-node network in Figure 1, we would like to trace the detailed evolution of the protocol. The protocol starts at iteration 0 in which each node only knows about itself (i.e., it is an island.). Assume that the protocol is synchronized for all the nodes. That is, all the nodes will update their routes at the same time based on the distance vectors from the last iteration. In iteration 1, each node discovers its neighboring nodes. Iteration 2 and 3 are intentionally blank. In iteration 4, the routing protocol converges. You are asked to fill in the missing diagrams for iteration 2 and 3.

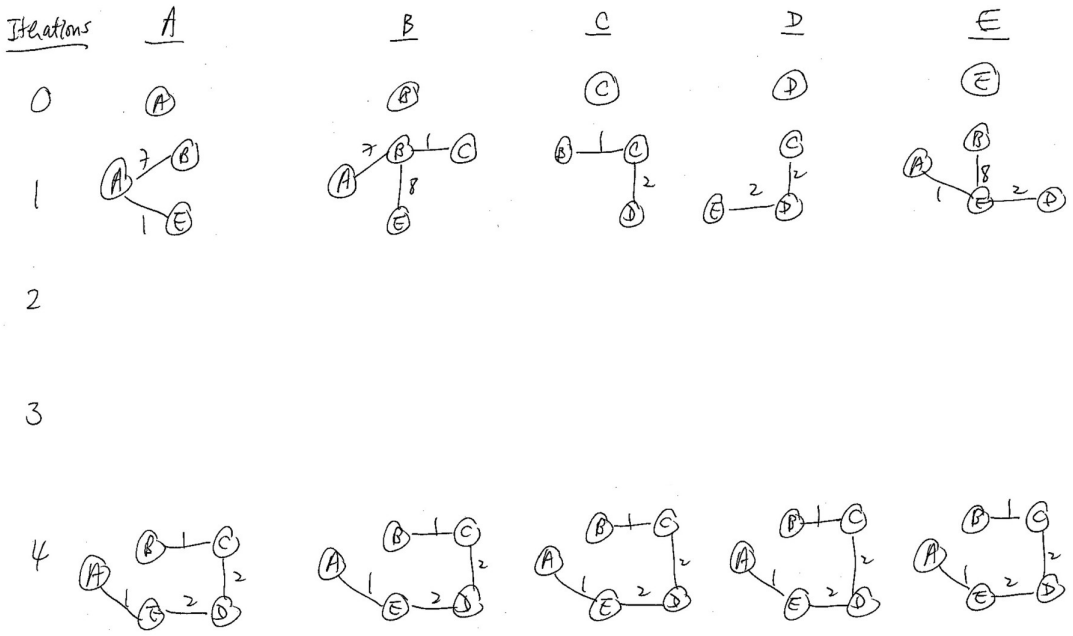


Figure 2: The partial evolution of the distance routing protocol for the 5-node network.