Computer Networks

Spring 2022

Homework Assignment of Week 5 (Network Layer)

Problem 1: Textbook Chapter 4, R4

R4. What is the role of the forwarding table within a router?

Problem 2: Textbook Chapter 4, R10

R10. Three types of switching fabrics are discussed in Section 4.2. List and briefly describe each type. Which, if any, can send multiple packets across the fabric in parallel?

Problem 3: Textbook Chapter 4, P7

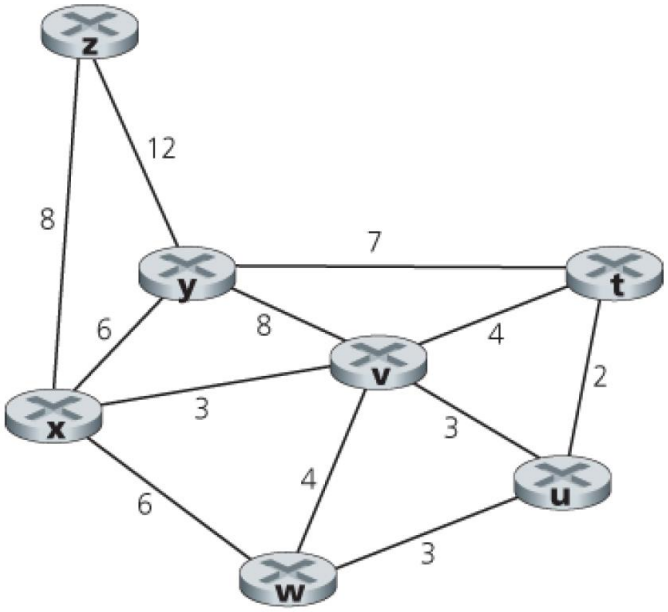
P7. Consider a datagram network using 8-bit host addresses. Suppose a router uses longest prefix matching and has the following forwarding table:

Prefix Match	Interface
1	0
10	1
111	2
otherwise	3

For each of the four interfaces, give the associated range of destination host addresses and the number of addresses in the range.

Problem 4: Textbook Chapter 5, P3

P3. Consider the following network. With the indicated link costs, use Dijkstra's shortest-path algorithm to compute the shortest path from x to all network nodes. Show how the algorithm works by computing a table similar to Table 5.1.



Problem 5: Textbook Chapter 5, P5

P5. Consider the network shown below, and assume that each node initially knows the costs to each of its neighbors. Consider the distance-vector algorithm and show the distance table entries at node z.