King Fahd University of Petroleum and Minerals College of Computer Sciences and Engineering Department of Computer Engineering

COE 344 – Computer Networks (T101)

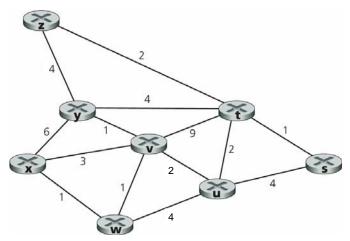
Homework # 04 (due date & time: Sunday 19/12/2010 during class period)

Late homework submission will NOT be accepted

*** Show all your work. No credit will be given if work is not shown! ***

Problem # 1 (50 points):

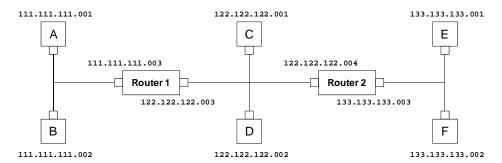
Consider the following network.



With the indicated link costs, use *Dijkstra*'s shortest-path algorithm, <u>as discussed in class</u>, to compute the shortest path from y to all network nodes using the table given below.

N'	D(s),p(s)	D(t),p(t)	D(u),p(u)	D(v),p(v)	D(w),p(w)	D(x),p(x)	D(z),p(z)

<u>Problem # 2 (18 points):</u> Consider the following IP-based network with the assigned IP addresses as shown.



1. Complete the following table assuming that host B sends an IP datagram to host C.

Source IP address	Destination IP address	IP address that was passed down to Data Link layer to be used for forwarding	

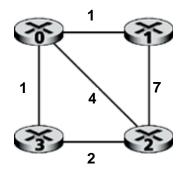
2. Complete the following table assuming that host A sends an IP datagram to host E.

Source IP address	Destination IP address	IP address that was passed down to Data Link layer to be used for forwarding

3. Complete the following table assuming that host F sends an IP datagram to host D.

Source IP address	Destination IP address	IP address that was passed down to Data Link layer to be used for forwarding

Problem #3 (32 points): Consider the following network.



Starting with the initialization step, compute the distance tables for nodes 0, 1, 2, and 3 after each iteration of a synchronous version of the distance vector algorithm using as many of the following tables as needed. Start with the leftmost column of the tables.

cost to	cost to	cost to	cost to	cost to
D^0 0 1 2 3	D^0 0 1 2 3	D^0 0 1 2 3	D^0 0 1 2 3	D^0 0 1 2 3
0	0	0	0	0
9 1	<u>e</u> 1	0 1	<u>e</u> 1	0 1
2	2	2	2	2
3	3	3	3	3
cost to	cost to	cost to	cost to	cost to
D^1 0 1 2 3	D^1 0 1 2 3	D^1 0 1 2 3	D^1 0 1 2 3	$D^1 0 1 2 3$
	0	0		
0 1	0 1		<u>e</u> 1	0 1
2	2	2	2	2
3	3	3	3	3
cost to	cost to	cost to	cost to	cost to
D^2 0 1 2 3	D^2 0 1 2 3	D^2 0 1 2 3	D^2 0 1 2 3	D^2 0 1 2 3
0	0	0	0	0
9 1	a 1	7 1 1 1 1 1		\vdash
		9 1	<u>e</u> 1	0 1
2	2	2	2	2
2 3	2 3	2 3	2 3	2 3
3	3	3	3	3
2	2	2	2	2
2	2	2	2	2
2	2	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	2
Cost to D ³ 0 1 2 3	Cost to D3 0 1 2 3	Cost to D3 0 1 2 3	Cost to D3 0 1 2 3	cost to D ³ 0 1 2 3 0 1 1 2 3
Cost to D ³ 0 1 2 3 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	2