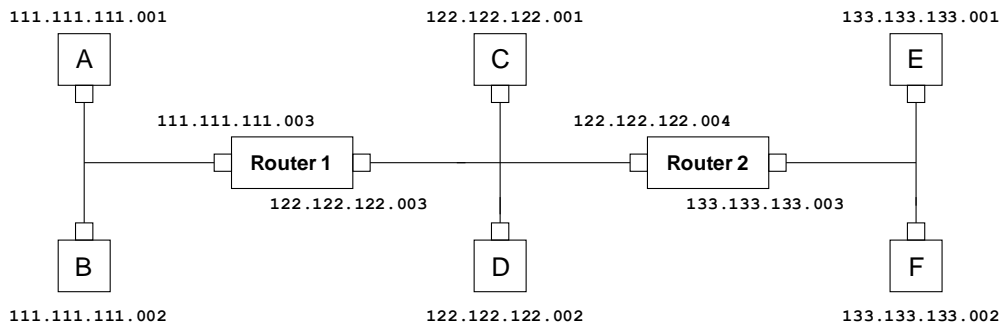


Problem # 2 (18 points): Consider the following IP-based network with the assigned IP addresses as shown. For each of the following cases, complete the table regarding the datagram as it is forwarded from the source to the destination.



1. Assume that host **B** sends an IP datagram to host **D**.

| Source IP address | Destination IP address | Receiving interface IP address that was passed down to the Data Link layer to be used for forwarding |
|-------------------|------------------------|--|
| | | |
| | | |
| | | |

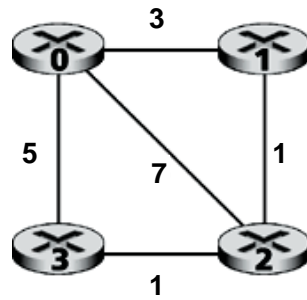
2. Assume that host **B** sends an IP datagram to host **E**.

| Source IP address | Destination IP address | Receiving interface IP address that was passed down to the Data Link layer to be used for forwarding |
|-------------------|------------------------|--|
| | | |
| | | |
| | | |

3. Assume that host **E** sends an IP datagram to host **D**.

| Source IP address | Destination IP address | Receiving interface IP address that was passed down to the Data Link layer to be used for forwarding |
|-------------------|------------------------|--|
| | | |
| | | |
| | | |

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



Suppose that the link cost $c(0,2)$ has changed from 7 to 1, re-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. Note that the current tables' values *prior* to the link cost change are as shown in 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 |
| from | 0 | 0 | 3 | 4 | 5 | 0 | | | | | 0 | | | | | 0 | | | | | 0 | | | | |
| | 1 | 3 | 0 | 1 | 2 | 1 | | | | | 1 | | | | | 1 | | | | | 1 | | | | |
| | 2 | 4 | 1 | 0 | 1 | 2 | | | | | 2 | | | | | 2 | | | | | 2 | | | | |
| | 3 | 5 | 2 | 1 | 0 | 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 |
| from | 0 | 0 | 3 | 4 | 5 | 0 | | | | | 0 | | | | | 0 | | | | | 0 | | | | |
| | 1 | 3 | 0 | 1 | 2 | 1 | | | | | 1 | | | | | 1 | | | | | 1 | | | | |
| | 2 | 4 | 1 | 0 | 1 | 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 |
| from | 0 | 0 | 3 | 4 | 5 | 0 | | | | | 0 | | | | | 0 | | | | | 0 | | | | |
| | 1 | 3 | 0 | 1 | 2 | 1 | | | | | 1 | | | | | 1 | | | | | 1 | | | | |
| | 2 | 4 | 1 | 0 | 1 | 2 | | | | | 2 | | | | | 2 | | | | | 2 | | | | |
| | 3 | 5 | 2 | 1 | 0 | 3 | | | | | 3 | | | | | 3 | | | | | 3 | | | | |

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|------|---------|----------|----------|----------|----------|---------|---|---|---|---|---------|---|---|---|---|---------|---|---|---|---|---------|---|---|---|---|
| | cost to | | | | | cost to | | | | | cost to | | | | | cost to | | | | | cost to | | | | |
| | D^3 | 0 | 1 | 2 | 3 | D^3 | 0 | 1 | 2 | 3 | D^3 | 0 | 1 | 2 | 3 | D^3 | 0 | 1 | 2 | 3 | D^3 | 0 | 1 | 2 | 3 |
| from | 0 | 0 | 3 | 4 | 5 | 0 | | | | | 0 | | | | | 0 | | | | | 0 | | | | |
| | 1 | ∞ | ∞ | ∞ | ∞ | 1 | | | | | 1 | | | | | 1 | | | | | 1 | | | | |
| | 2 | 4 | 1 | 0 | 1 | 2 | | | | | 2 | | | | | 2 | | | | | 2 | | | | |
| | 3 | 5 | 2 | 1 | 0 | 3 | | | | | 3 | | | | | 3 | | | | | 3 | | | | |