Due Date: Monday, November 11 by 11:59pm
Submission: type your answers in a Word document and submit it to Canvas.

1. IP addressing.

(a) Write the IP address 129.17.129.96 in its binary form. **[1 point]**
(b) Suppose an organization owns a block of addresses of the form 129.17.129.96/27. Provide the range of IP addresses in dotted decimals that can be assigned to the organization. **[1 point]**
(c) Suppose the organization wants to create four subnets from the block of IP addresses, with each block having the same number of IPv4 addresses. What are the CIDR notations (of form xxx.xxx.xxx.xxx/y) for the four IPv4 subnets? **[2 points]**

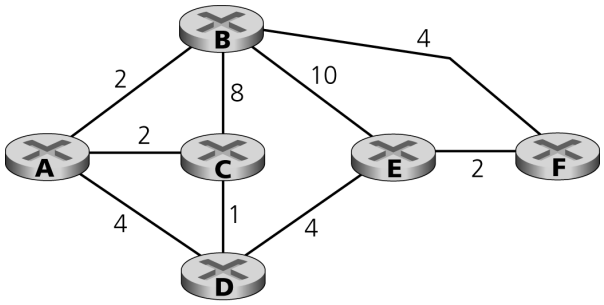
2. Longest prefix matching.

Consider a datagram network using 32-bit host addresses, and a router that has three interfaces, numbered 0 through 2. Packets are to be forwarded to these link interfaces as follows. Any address not within the ranges in the table below should not be forwarded to an outgoing link interface. Create a forwarding table using longest prefix matching. **[1 point]**

Destination address range	Outgoing link interface
00000000 00000000 00000000 00000000 through 00000001 11111111 11111111 11111111	0
00000000 00000000 10000000 00000000 through 00000000 00000000 11111111 11111111	2
01010101 00000000 00000000 00000000 through 01010101 11111111 11111111 11111111	1
01010110 00000000 00000000 00000000 through 01010111 11111111 11111111 11111111	2

3. Dijkstra's algorithm (a Link State algorithm)

Consider the network topology shown below.



(a) Create a table similar to Chapter 5 slide #5-15 and show the operation of Dijkstra's algorithm for computing the least cost path from E to all destinations. **[2 points]**

(b) Mark the shortest path tree on the graph based on (a) and create a forwarding table for router E to include the outgoing links to all the routers in the graph. **[2 points]**

(c) With a same network topology above, create a table similar to Chapter 5 slide #5-15 and show the operation of Dijkstra's algorithm for computing the least cost path from B to all destinations. **[2 points]**