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EE334 Homework: Subnetting

Problems:

- **Pg. 2 – 4 of this PS**

Additional Problems (Instructor Option):

- **Answer the Supplemental Questions included with this Problem Set (*You may want to use a search engine to help answer some of the questions.*)**

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1. You have been using a computer for years with the IP Address 192.37.12.39 and after taking EE 334 you are now able to learn what the numbers mean. As a demonstration of your new found skill, answer the following questions.
 - a. What class Network are you on?
 - b. What is the Network Mask of your network?
 - c. What is your Network ID?
 - d. How many bits are assigned to the Network ID?
 - e. How many bits are assigned to the Host ID?
 - f. If the Subnet mask is 255.255.255.224, what is your Subnet ID?
 - g. How many bits are assigned to the Subnet?
 - h. How many subnets can be supported?
 - i. How many bits are used for hosts on each subnet?
 - j. How many hosts can each subnet support?
 - k. What is the IP address of the first Subnet?
 - l. What is the first assignable IP in the first Subnet?
 - m. What is the Broadcast for the Subnet you are on?

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2. Repeat Problem 1 with an IP Address of 131.122.81.86.
 - a. What class Network are you on?
 - b. What is the Network Mask of your network?
 - c. What is your Network ID?
 - d. How many bits are assigned to the Network ID?
 - e. How many bits are assigned to the Host ID?
 - f. If the Subnet mask is 255.255.252.0, what is your Subnet ID?
 - g. How many bits are assigned to the Subnet?
 - h. How many subnets can be supported?
 - i. How many bits are used for hosts on each subnet?
 - j. How many hosts can each subnet support?
 - k. What is the IP address of the first Subnet?
 - l. What is the first assignable IP in the first Subnet?
 - m. What is the Broadcast IP address for the Subnet you are on (from beginning of problem)?

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3. Given the address 194.120.85.26, find the following:

Network Class:

Network Mask:

Network ID:

Number of possible hosts on network:

Broadcast IP for this network:

4. What is a subnet address and why is it important?

5. What is a subnet mask used for?

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Supplemental Questions
(Optional – Complete only if assigned by your instructor)

1. Which protocol is recommended for faster data transmission, if an application provides its own error handling function?
 - a. TCP-IP
 - b. SMTP
 - c. UDP
 - d. DHCP

2. Which address would be used to broadcast messages to all computers in a 129.70.102.xxx network?
 - a. 129.70.102.0
 - b. 129.70.102.127
 - c. 129.70.102.255
 - d. 129.0.0.0

3. From the following addresses, which address is used by the router to address itself?
 - a. 123.65.101.0
 - b. 123.65.101.127
 - c. 123.65.101.255
 - d. 123.65.101.256

4. Consider a company that has a network in five different buildings. Each building has 30 nodes and its own set of server and printers. If you want to transmit data occasionally such as e-mail, accounting data, what method of assigning IP addresses would be advisable?
 - a. Use single set of Class C address and assign addresses from this set.
 - b. Use separate Class C address for each building.
 - c. Use divided Class C address so that each building will have a virtual network ID.
 - d. Use different Class A addresses.

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5. Your company has four offices in four separate buildings and one Class C IP address. If you use a subnet mask of "11111111.11111111.11111111.11100000" to configure your network, which of the following IP addresses would be generated?

- | | | | | | |
|----|---------|----------|----------|----------|----------|
| a. | Bldg. 1 | 11001100 | 00001111 | 11110000 | 001XXXXX |
| | Bldg. 2 | 11001100 | 00001111 | 11110000 | 010XXXXX |
| | Bldg. 3 | 11001100 | 00001111 | 11110000 | 011XXXXX |
| | Bldg. 4 | 11001100 | 00001111 | 11110000 | 100XXXXX |
| b. | Bldg. 1 | 11001100 | 00001111 | 11110000 | 001XXXXX |
| | Bldg. 2 | 11001100 | 00001111 | 11010000 | 001XXXXX |
| | Bldg. 3 | 11001100 | 00001111 | 10110000 | 001XXXXX |
| | Bldg. 4 | 11001100 | 00001111 | 01110000 | 001XXXXX |
| c. | Bldg. 1 | 11001100 | 00001111 | 11110000 | 001XXXXX |
| | Bldg. 2 | 11001100 | 00011111 | 11110000 | 001XXXXX |
| | Bldg. 3 | 11001100 | 00101111 | 11110000 | 001XXXXX |
| | Bldg. 4 | 11001100 | 00111111 | 11110000 | 001XXXXX |
| d. | Bldg. 1 | 11001100 | 00001111 | 11110000 | 001XXXXX |
| | Bldg. 2 | 10001100 | 00001111 | 11110000 | 001XXXXX |
| | Bldg. 3 | 01001100 | 00001111 | 11110000 | 001XXXXX |
| | Bldg. 4 | 00001100 | 00001111 | 11110000 | 001XXXXX |

6. If you have a Class C address with a binary subnet mask of "11111111.11111111.11111111.11110000", how many different subnets are possible?

- | | |
|------|-------|
| a. 0 | c. 14 |
| b. 6 | d. 30 |

COMPLETION

1. The _____ defines how network data is addressed from a source to a destination, whereas Transmission Control Protocol manages connections between computers.
2. IP addresses are currently _____ bits long.
3. The length of Next generation IP address is _____ bits.

ESSAY

1. What is a network protocol?
2. How does UDP differ from TCP, in terms of functionality?
3. What are the major classes assigned for IP addresses by ICANN? Explain how they are different from each other.
4. List the various types of domains other than .com.
5. What are the two components of an IP address and what do they identify?