# Assignment:

## IP Addresses and IP subnetworks

**Problem 1.**  Consider an Ethernet network with three hosts, Host A, Host B, and Host C as shown in Figure 1. No machine is configured as an IP router, and there is no IP router on this network. Assume that the IP addresses  and subnet masks are as shown in the figure.

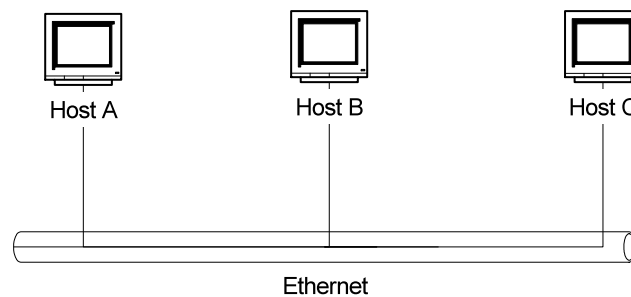| IP Adress: | 192.0.3.88 | 192.0.3.94 | 192.0.3.200 |
| --- | --- | --- | --- |
| Subnet Mask: | 255.255.255.0 | 255.255.255.240 | 255.255.255.240 |



Figure 1: Network Topology

For each of the following IP datagram transmissions, describe if the transmissions will be successful. If a transmission  will not work, provide an explanation:

  (a) Host C sends an IP datagram to Host A
  (b) Host A sends an IP datagram  to Host B
  **(c)** Host A sends an IP datagram to Host C
  (d) Host B sends an IP datagram to Host A
  (e) Host B sends an IP datagram to Host C

**Problem 2.**  Consider the 128.100.112.0/21 block of IP addresses. This block of addresses must be divided into four subnetworks that have each at least 500 IP addresses.
  a)  Give the subnet mask of the four new subnetworks.
  *b)*  Specify the network address and the network prefix for each subnetwork.
  c)  Specify the broadcast IP address for each subnetwork.

**Problem 3.**  Select a subnet mask for 10.0.0.0/8 so that there will be at least 16,000 subnets with at least 700 host addressed on each subnet.

**Problem 4.**  Assume that you have been assigned the 200.35.1.0/24 network block.
  a)  Define an extended-network-prefix that allows the creation of 20 hosts on each subnet.
  b)  What is the maximum number of hosts that can be assigned to each subnet?
  c)  What is the maximum number of subnets that can be defined?
  d)  Specify the subnets of 200.35.1.0/24 in binary format and dotted decimal notation.
  e)  List range of host addresses that can be assigned to Subnet #6 (200.35.1.192/27)
  f)  What is the broadcast address for subnet 200.35.1.192/27?