

COMPILER DESIGN LAB

(CSL5404)

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Assignment - 2

Q1. For the following IP Addresses-​

1.2.3.4​

10.15.20.60​

130.1.2.3​

150.0.150.150​

200.1.10.100​

220.15.1.10​

250.0.1.2​

300.1.2.3​

Identify these  ​

A. Class, ​

B. Network IP Address, ​

C.Direct broadcast address ​

D.Limited broadcast address of each IP Address.​

1 > Solution

Given IP Address is-

1.2.3.4

IP Address belongs to class A

Network IP Address = 1.0.0.0

Direct Broadcast Address = 1.255.255.255

Limited Broadcast Address = 255.255.255.255

Given IP Address is-

10.15.20.60

IP Address belongs to class A

Network IP Address = 10.0.0.0

Direct Broadcast Address = 10.255.255.255

Limited Broadcast Address = 255.255.255.255

Given IP Address is-

130.1.2.3

IP Address belongs to class B

Network IP Address = 130.1.0.0

Direct Broadcast Address = 130.1.255.255

Limited Broadcast Address = 255.255.255.255

Given IP Address is-

150.0.150.150

IP Address belongs to class B

Network IP Address = 150.0.0.0

Direct Broadcast Address = 150.0.255.255

Limited Broadcast Address = 255.255.255.255

Given IP Address is-

200.1.10.100

IP Address belongs to class C

Network IP Address = 200.1.10.0

Direct Broadcast Address = 200.1.10.255

Limited Broadcast Address = 255.255.255.255

Given IP Address is-

220.15.1.10

IP Address belongs to class C

Network IP Address = 220.15.1.0

Direct Broadcast Address = 220.15.1.255

Limited Broadcast Address = 255.255.255.255

Given IP Address is-

250.0.1.2

IP Address belongs to class E

Network IP Address = Not available

Direct Broadcast Address = Not available

Limited Broadcast Address = Not available

Given IP Address is-

300.1.2.3

This is not a valid IP Address.

This is because for any given IP Address, the range of its first octet is always [1, 254].

First and Last IP Addresses are reserved.

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2 > Solution

The binary representation of the given address is

11001101 00010000 00100101 00100111.

If we set 32 - 28 rightmost bits to 0,

we get 11001101 000100000100101 0010000 or 205.16.37.32.

FirstBlock                            Block

205.16.37.32                11001101 00010000 00100101 00100000

     .                      11001101 00010000 00100101 00100001  [16 Addresses]

     .                                  .

     .                                  .

     .                                  .

205.16.37.47                11001101 00010000 00100101 00101111

  LastBlock

  Decimal                             Binary

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3 > Solution :

Yes both 255.255.0.0 and or 255.255.255.0 would work.

Mask 255.255.0.0 has 8 bits for the subnet and 16 bits for the host

8 bits would accommodate 28=256 subnets

16 bits would accommodate 216= over 64000 hosts

Mask 255.255.255.0 has 16 bits for the subnet and 8 bits of the host.

Have possible 28 -2 hosts =254 which is enough

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4 > Solution

Current mask= 255.255.255.0

Bits needs for 10 subnets =4 =2^4 =16 possible subnets

Bits needs for 12 hosts = 2^4-2 = 16-2=14 possible hosts.

So our mask in binary =11110000= 240 decimal

Final Mask =255.255.255.240

Hosts on Subnets 0,1,2,3,10

  Subnet O host 1 IP address = 195.1.1.1 0000 0001

• Subnet 1 host 1 IP address = 195.1.1.17 0001 0001

• Subnet 2 host 1 IP address = 195.1.1.33 0010 0001

• Subnet 3 host 1 IP address = 195.1.1.49 0011 0001

• Subnet 10 host 1 IP address = 195.1.1.161 1010 0001

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5 > Solution

Current mask= 255.255.255.0

Bits needs for 30 subnets =5 =2^5 =32 possible subnets

Bits left for hosts = 3 = 2^3  = 8-2=6 possible hosts.

So our mask in binary =11111000= 248 decimal

Final Mask =255.255.255.248

Address of host 3 on subnet 2 is

subnet 2 =00010000 host 3 =000000011

Add the two together =00010011=19

therefore IP address of host 3 on subnet  2 =205.11.2.19

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6 > Solution

Current mask= 255.255.255.0

Bits needs for 48 hosts = 6 = 2^6 = 64-2=62 possible hosts.

Bits needs for 2 subnets =1 =21 = 2 possible subnets

Total of 7 bits needed so therefore we can use either 1 bit or 2 bits for the subnet.

So we could have 1 bit subnet 7 bits hosts or 2 bits subnet 6 bit host

masks are 10000000 and 11000000 =128 decimal and 192 decimal.

Final possible masks are:

255.255.255.128 and 255.255.255.192

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7 > Solution

192 in binary =11000000 gives 4 possible subnets of (showing 2 most significant bits):

00,01,10,11

67 in binary =01000011

So Applying Mask:

67 in binary = 01000011

Therefore subnet=1 and host address = 3

Mask

11000000

67 in binary =01000011

therefore subnet =1 and host address = 3

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End Of Assignment

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