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PC-12

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CN

Lab Assignment-5

Title: Subnetting

Aim: Write a program to implement subnetting to find subnet mask.

Objectives: To understand and learn the concept of IP address, subnet mask and subnetting.

Theory:

1) Introduction to IPv4 and IPv6 along with diff.

⇒ IPv4 and IPv6 are internet protocol version 4 and internet protocol version 6, IP version 6 is new version which is way better than IP version in terms of complexity and efficiency.

IPv4 has a header of 20-60 bytes.

IPv4 consists of 4 fields which are separated by dot (.).

2) CIDR:

⇒ It is a method of assigning internet protocol addresses that improves the efficiency of address distribution and replaces the previous system based on class A, class B and class C networks.

3) Default subnet mask for class A, B, C

⇒ Class A - 255.0.0.0

Class B - 255.255.0.0

Class C - 255.255.255.0

4) Subnetting ex:

⇒ A subnet is a sub-network of a network that falls with the class A, B or C range.

Ex) 172.16.0.0 is class B network.

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Student Observation

Thus, we have written a program to implement subnetting to find subnet mask.

FAQ's

Ans 1) In classful routing, address is divided into three parts which are: Network, Subnet and Host while in classless routing: address is divided into two parts which are: Subnet and Host.

Ans 2) The IP address range 127.0.0.0 – 127.255.255.255 is reserved for loopback i.e a Host's self-address also known as localhost address. This loopback IP address is managed entirely by and within the OS.

Ans 3) It enhances routing efficiency, network management control and improving network security.

Ans 4) A) IP address → 200.50.100.0

It belongs to class C

Subnet mask = 200.50.100.240

b) to create → 14 subnets

n = no of bits required for subnetting

n = 0	$2^0 = 1$	< 14	X
n = 1	$2^1 = 2$	< 14	X
n = 2	$2^2 = 4$	< 14	X
n = 3	$2^3 = 8$	< 14	X
n = 4	$2^4 = 16$	> 14	✓

So we can form a total of 16 subnets using 4 bits and any 14 of these can be used for subnetting.

no. of addresses in each subnet = $2^{(8-4)} - 2$

$= 2^4 - 2 = 16 - 2 = 14$.

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c) First = 200.50.100.0
Last = 200.50.100.15

d) First = 200.50.100.208
Last = 200.50.100.223

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