CNL Roll No 31147

Assignment 3

Problem Statement:
Write a program to demonstrate subnetting & find the subnet masks.

Objectives:
1) Learn about the subnetting and subnet masks.
2) Learn about network & broadcast address.

Requirements:
Fedora 20, 4 GB RAM
Java installed, VS code.

Theory:
Subnetting:
When a bigger network is divided into smaller networks in order to maintain security, then that is known as subnetting so maintenance is easier for smaller networks.
To best utilize available addresses if we put more than 16000000 hosts in a single network, due to broadcast & collision, that network will never work. If we put less hosts then remaining addresses will be wasted.
Subnetting provides a better way to deal with this situation Subnetting allows us to create smaller networks from a single large network for which only fulfill our host's requirement but also offer several other networking benefits.

Netmasks:
Netmasks or subnet mask are a shorthand for referring to ranges of consecutive IP address in the Internet protocol They used for defining networking rules eg. routers & final Entity communicating on the internet will have a unique internet protocol address. Most commonly, these addresses are written human-readable notation as follows:
192.168.0.1.

Page No.
Date

A netmask is a shorthand for describing for describing a range of IP addresses. A netmask may describe just a single IP address. 192.168.0.1/32 just the address 192.168.0.1

The left hand side of a network (192.168.0.1) specifies a the host IP address. The right hand side specify (eg /32) how many digits of the host address are significant, when considered as a binary number. Non-significant bits in the binary form are treated are wild card.

For instance in the netmask 192.168.0.1/32, the host address is 192.168.0.1. This can be written in binary as 11000000.10101000.11111111.00000001. To match this netmask, an address must have match 32 digits. ie- have the binary digit in each position. This means only one address will be matched by this pattern.

The netmask 192.168.0.1/31 states that the last binary digit is not significant, so will match two addresses.
192.168.0.0 and 192.168.0.1.

Test case:

1) Enter IP : 192.168.1.20
BINARY IP : 11000000.10101000.00000001.00010100
Enter the number of addresses in each subnet : 14.
IP belongs to class : C
Default Mask : 255.255.255.0
HOST BITS : 4 SUBNET BITS : 4.
Subnet Mask
No of Subnets : 16.
No of host per Subnet : 14
Binary : 11111111.11111111.11111111.11110000
Decimal : 255.255.255.240

Network Address :
Binary : 11000000.10101000.00000001.00010000
Decimal : 192.168.1.16.

Conclusion :
Learnt about subneting and IP address, and implemented the code using JAVA.