# Assignment A3

**Title:** Subnetting

**Problem Statement:** Write a program in JAVA/Python to demonstrate sub netting and find the sub net masks.

**Software Requirements:**
Fedora 20 with Pentium IV and above 1 GB RAM, Eclipse IDE

**Hardware Requirements:**
120 GB HDD, Monitor, Keyboard, Mouse, modelio,

**Theory:**

**Subnetting:**

Subnetting is a process of dividing large network into the smaller networks based on layer 3 IP address. Every computer on network has an IP address that represent its location on network. Two versions of IP addresses are available IPv4 and IPv6.
In this assignment we have performed subnetting IPv4

**IPv4**

IP addresses are displayed in clotted decimal notation, and appear as four numbers separated by dots. Each number of an IP address is made from eight individual bits known as octet.
Each octet can create number value from 0 to 255.
An IP address would be 32 bits long in binary

divided into two components.
network component and host component

Network component is used to identify the network that the packet is intended for and host component is used to identify the individual host on network

IP addresses are broken into the two components:

(i) Network component: Defines network segment of device.

(ii) Host component: Defines the specific device on a particular network segment.

Subnet mask:

Subnet mask is a 32 bit long address used to distinguish between network address and host address in IP address. Subnet mask has only one purpose. to identify which part of an IP address is network address and which part is host address

In decimal notation:

IP address : 192.168.1.10
Subnet mask : 255.255.255.0
Network address is 192.168.1 and host address is 10.

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Following is the IP class table with default subnet.

| IP class | Default Subnet | Network bits | Host bits | Total hosts | Valid hosts |
|---|---|---|---|---|---|
| A | 255.0.0.0 | First 8 bits | Last 24 bits | 16.777.216 | 16.777.214 |
| B | 255.255.0.0 | First 16 bits | Last 16 bits | 65,536 | 65.534 |
| C | 255.255.2550 | First 24 bits | Last 8 bits | 256 | 254 |

Advantages of Subnetting:

(i) Subnetting breaks large network in smaller networks and smaller networks are easier to manage.

(ii) Subnetting reduces network traffic by removing collision and broadcast traffic. that overall improve performance.

(iii) Subnetting allows you to apply network security policies at the interconnection between subnets.

(iv) Subnetting allows you to save money by reducing requirement for IP range.

Outcomes:

The output will be the subnet mask of given IP address of the host.

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Conclusion: Successfully implemented the subnetting and subnet mask program in JAVA.