31201

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Assignment - 03

- **Title** :- Subnetting.
- **Problem Defination** :- Write a program in JAVA/ Python to demonstrate subnetting and find subnet mask.
- **Objective** :- To understand the concept of subneting
- **Theory**

→ When a network is divided into smaller network, it is known as Subnetting.
→ Subnetting has the following benefits.
1.) Improve Network Security
2.) Easy Network Maintenance
3.) less Congestion in Network

→ Subnetting is done by identifying the class of the IP Address.
→ An IP address consits of 4 octets, the value of the first octet can be used to determine the class of the IP address.
→ There are five classes A, B, C, D, E
→ The class name helps us in getting a range for network ID & host ID.

This allows us to determine to tell network & total hosts per class.

- Different IP allocation Class wise

	First Octet	Network ID	Host ID
Class A	<128	8 bit	24 bit
Class B	>128 & <192	16 bit	16 bit
Class C	>192 & <224	24 bit	8 bit
Class D	>224 & < 240	—	—
Class E	>240 & < 256	—	—

→ After obtaining the network of host in a network we can divide the hosts into subnetworks.

→ Eg: let the IP be 192.168.1.127

→ This a class C IP:

Subnet Mask = 255.255.255.0

Total available host = 255

Suppose we want to divide the network into 2 subnets.

Range of 2 subnets would be

(a) 192.168.1.0 → 192.168.1.127

(b) 192.168.1.128 → 192.168.1.255

Using Subneting a host can be divided into various subnets.

Test Cases

Input	Expected O/p	Actual O/p
1) IP 192.168.1.10 No. of Subnets = 4	Class C IP Subnet Address 192.168.1.0 192.168.1.64 192.168.1.128 192.168.1.192	Success
2) IP: 10.10.10.220 ⇒ Subnets = 2	Class A IP Subnet Address 10.0.0.0 10.128.0.0	Success

Conclusion

Thus, using the concepts of subnetting, we were able to divide a network into different parts.