# Computer Networking: Concepts
# (CSE 3751)

## Experiment 6

### Aim

To implement subnetting and Variable Length Subnet Masking (VLSM) in a network using Cisco Packet Tracer and verify communication across subnets.

### Objectives

1. Understand IPv4 addressing, CIDR notation, subnetting, and VLSM in an IPv4 network
2. Assign subnet addresses to multiple LANs based on host requirements.
    a. Using fixed-length subnets  b. Using VLSM
3. Configure routers and PCs in Cisco Packet Tracer.
4. Verify intra-subnet and inter-subnet communication using ping commands.

**Part 1:**

***Problem Statement:*** A company receives a network 172.16.0.0/24 and wants to divide it into the following subnets:

**Subnet A:** 40 hosts  **Subnet B:** 20 hosts

**Subnet C:** 10 hosts  **Subnet D:** 5 hosts

Design the network using **fixed-length subnetting** (not VLSM). Assign IP addresses to routers and PCs, configure routing, and verify communication.

**Part 2:**

***Problem Statement:*** Design the network using VLSM for the scenario given in **Part 1**.

### Exercises:

1. Express the following classful IP addresses in CIDR notation:

    a. 195.30.10.20  b. 100.50.20.10  c. 130.10.15.25

2. Given the IP address of a device as 192.169.20.126/25. Find the subnet mask and network ID in dotted decimal notation.

3. A network with ID 200.10.20.0 is divided into 4 subnets. Find the number of hosts per subnet. Also, for all the subnets, find

    a. Subnet Address  b. First Host ID  c. Last Host ID  d. Broadcast Address

4. Design a network using VLSM for the following requirements with the given network 200.100.50.0/24. Assign IP addresses accordingly: (a) Network A: 50 hosts, (b) Network B: 25 hosts, (c) Network C: 15 hosts, (d) Network D: 10 hosts