# Exercise 01 – IPv4 Addresses

**CMPE 151 Spring 2018**

## Part 1: Calculating Subnet Information

For a host with address configuration `5.228.229.195/27`, list the following:

- Binary representation:
- Network address.
- Subnet broadcast address.
- Range of host addresses.

For a host with address configuration `192.4.4.67/23`, list the following:

- Binary representation:
- Network address.
- Subnet broadcast address.
- Range of host addresses.

**Part 2: FORWARDING TABLE LOOKUPS**

Which of the following addresses matches this prefix?

- **PREFIX**: 32.0.0.0/4:
- **ADDRESSES**
    - 110.119.22.0:
    - 46.209.10.0:
    - 5.0.1.0:
    - 33.33.1.0:
    - 96.21.3.0:

Which of the following IP prefixes does the IP address match? Which prefix would be used to forward a packet with this address?

- **ADDRESS:** 95.254.36.0
- **PREFIXES**
    - 95.254.46.0/20:
    - 95.254.37.0/24:
    - 95.254.36.0/24:
    - 95.254.40.0/23:

Which of the prefixes in the list contains both addresses?

- **ADDRESSES**
    - 229.65.47.0
    - 229.65.56.0
- **PREFIXES**
    - 229.65.32.0/20:
    - 229.65.49.0/20:
    - 229.65.37.0/19:
    - 229.65.35.0/21:

## Part 3: Subnet Overlapping

**Can there be two different but overlapping IP address ranges, defined using the <**address>/<mask length> **notation, where neither contains the other? Prove your answer (if you say yes, give an example; if you say no, give a proof).**

## Part 4: Routing Table – More Specific and Less Specific routes

**Can a router's IP routing table contain both more specific route and a less specific route, both forwarding packets to different next hop routers? Explain why or why not? If yes, include why this may occur.**