

# COSC 118 Lab Assignment 6

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## Objectives

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1. To understand subnetting and calculate subnetwork information.
2. To comprehend supernetting.

## Before You Start

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You should first download the assignment submission sheet. The tables you need to fill are provided to you.

## Part I: Exercises

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1. Textbook hands-on project 6-3 on page 303 (10 marks)
2. Textbook hands-on project 6-4 on page 303 (10 marks)

## Part II: Subnetting and Supernetting Experiments

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1. Inside your COSC 118 Appliance, download `COSC118L6P1.gns3` file from Moodle. Open it with GNS3. Complete the table in the submission sheet (10 marks). The first column is already filled.
  - i. Carefully observe the configuration of each of the VPCs. Write down the IP addresses and the subnet masks of the PCs in the submission sheet. Note that there is no PC4. It was removed to reduce the complexity of this lab.
  - ii. The configuration is using CIDR notation. Convert that into binary form then into octet form.
  - iii. Using the subnet masks, identify the network ID for each VPC. Write down the network ID in both binary form and octet form.
  - iv. For each of the VPC, what is the range of IP addresses that will share the same network ID with it? Write down your answer in the form. Your answer should look like "a.b.c.d to e.f.g.h". Hint: recall that the host id of all 0s is reserved for broadcasting and cannot be assigned to normal hosts.
2. After the sheet is fully filled, let's first identify some scenarios for a pair of PCs---let's call them PC A and PC B, that satisfy some criteria (4 marks):
  - i. A and B are inside the same network (i.e, same network ID and same prefix).
  - ii. A is NOT inside B's network, and B is not inside A's network.
  - iii. This scenario has two criteria:
    - a) PC A's network is a subnet of PC B's network (in other words, PC B's network is a supernet of PC A's network) and
    - b) Both A and B are inside A's network and also inside B's network.
  - iv. This scenario has two criteria:
    - a) PC A's network is a subnet of PC B's network (in other words, PC B's network is a supernet of PC A's network) and
    - b) A is inside B's network, but B is not inside A's network

3. For each of the scenarios, run the `ping` command from A to B and then from B to A and answer the question (16 marks)
- Did the `ping` command work?
  - If it did not work, did it fail at sending the ICMP echo request or at sending the ICMP echo reply? Hint: you can set up your Wireshark to capture the packets.
4. Bonus question: Why do you think `ping` will work in some scenarios but not in others? Why in some scenarios ICMP echo request can be sent but there will not be a reply? Hint: The `arp` command may give you some ideas. You can also use Wireshark to capture the ARP messages. (10 marks)

## Submit Your Work

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Save your submission sheet to a pdf document, and submit to Moodle.