Department of Computer Science and Engineering
Faculty of Engineering, University of Moratuwa
CS 2033 – Data Communication and Networking
B. Sc. Engineering Semester 3

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Index No **210518H**

Lab 5 : IP Addressing

1. How many octets are there in an IP address?

   4

2. How many bits per octet?

   8

3. List all the private IP address blocks.

   Class A: 10.0.0.0 to 10.255.255.255

   Class B: 172.16.0.0 to 172.31.255.255

   Class C: 192.168.0.0 to 192.168.255.255

4. Determine the network and broadcast addresses, number of hosts for the given IPv4 addresses, and prefixes in the following table.:

Host IP address	Network address	Number of hosts	Broadcast address
192.168.100.25/28	**192.168.100.16**	**14**	**192.168.100.31**
172.30.10.130/30	**172.30.10.128**	**2**	**172.30.10.131**
10.1.113.75/19	**10.1.96.0**	**8190**	**10.1.127.255**
172.16.104.99/27	**172.16.104.96**	**30**	**172.16.104.127**
128.107.14.191/22	**128.107.12.0**	**1022**	**128.107.13.255**

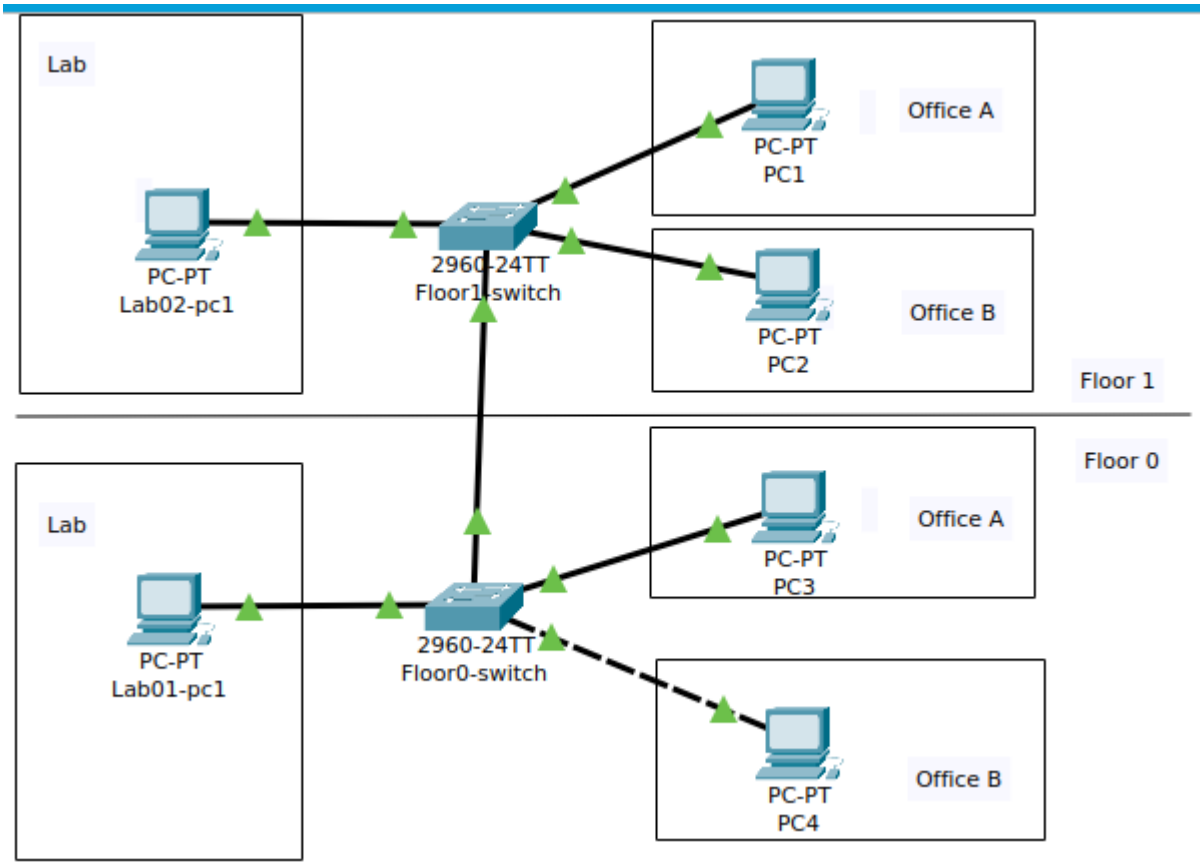
4. You are given an IP block of 10.10.10.0/24

   a. subnet and allocate IP addresses to a laboratory with 30 computers and 2 offices with 5 computers each in an optimal way, and complete the following table

Location	Network address	Broadcast address	First usable address	Last usable address
Laboratory	**10.10.10.0**	**10.10.10.31**	**10.10.10.1**	**10.10.10.30**
Office A	**10.10.10.32**	**10.10.10.39**	**10.10.10.33**	**10.10.10.38**
Office B	**10.10.10.40**	**10.10.10.47**	**10.10.10.41**	**10.10.10.46**

b. Create a network as shown in the picture below, as shown laboratory computers and office computers are distributed among two floors. Each floor has a switch to connect computers. These switches are connected using ethernet interfaces.

Note: In the network engineering lab, there are 6 workstations, each equipped with three computers, and a switch. You can assume each workstation to be a floor (as mentioned in the diagram above) and take one computer each for Lab-pc, Office A and Office B. For this lab a single group requires two workstations. Thus, arrange into groups of 8 or 9 so that there will be three student groups at a time in the lab, each group having two workstations.



c. Assign IP addresses to each computer based on your IP address plan.

Lab01-pc1 : 10.10.10.1

Lab02-pc1 : 10.10.10.2

PC3 (Office A) : 10.10.10.33

PC1 (Office A) : 10.10.10.34

PC4 (Office B) : 10.10.10.41

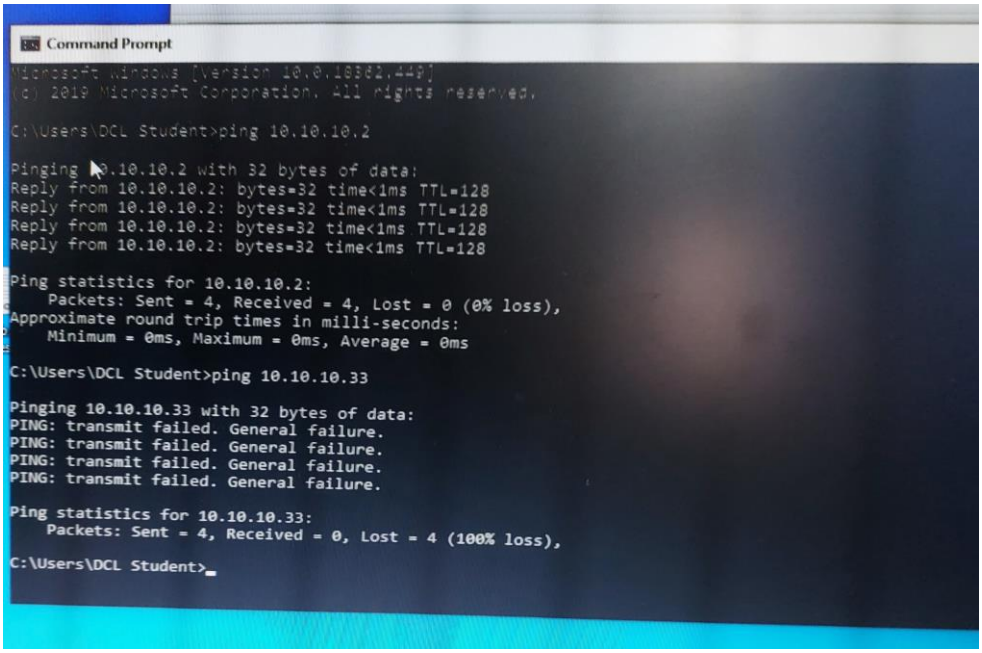
PC2 (Office B) : 10.10.10.42

d. Ping to different computers as given in the table, write your observation, and state why you could/could not ping.

Computer from → to	Observation	Reason
Lab01-pc1 → Lab02-pc2	**Success**	**Same Subnet**
Lab01-pc1 →PC3	**Host Unreachable**	**Different Subnet**
PC3 → PC1	**Success**	**Same Subnet**
PC3 → PC4	**Host Unreachable**	**Different Subnet**

Note: Each of one of you should do an individual labsheet submission to moodle submission link.

- **Lab01-pc1**



- **PC3**