National University of Singapore
School of Computing
CS2105: Introduction to Computer Networks
Semester 1, 2018/2019

Tutorial 5
Network Layer: Data Plane

These questions will be discussed during the next week's discussion group meetings. Please be prepared to answer these questions during the session in class. Some of the questions are taken from the textbook, so please bring it along for reference.

1. **[KR, Chapter 4, R13]** What is the 32-bit binary equivalent of the IP address 202.3.14.25?
2. What is the first and last IP addresses of the subnet associated with the following IP address:
   (a) 244.233.234.12/4
   (b) 10.45.123.34/19
3. Combine the following three blocks of IP addresses into a single block:
   (a) 16.27.24.0/26
   (b) 16.27.24.64/26
   (c) 16.27.24.128/25
4. **[Modified from KR, Chapter 4, P16]**
   (a) Consider a subnet with network prefix `192.168.56.128/26`. Give an example IP address (of form `xxx.xxx.xxx.xxx`) that belongs to this network.
   (b) Suppose an ISP owns the block of addresses of the form `192.168.56.128/26`. Suppose it wants to create four subnets from this block, with each block having the same number of IP addresses. What are the network prefixes (of form `a.b.c.d/x`) for the four subnets?
5. **[Modified from KR, Chapter 4, P12]** Consider a datagram network using 8-bit addresses. Suppose a router has the following forwarding table:

Prefix Match	Interface
11	0
101	1
100	2
otherwise	3

   For each of the four interfaces, give the associated range of destination host addresses and the number of addresses in the range.

Prefix Match	Interface	IP Range	No. of IP
11	0		
101	1		
100	2		
otherwise	3		

6. What is a private IP address? Does IVLE use private or public IP address? When your laptop is connected to NUS network, does it receive a private or public IP?