DATA COMMUNICATION & NETWORKING LAB

CEL 222

lab 2

MALIK ZOHAIB MUSTAFA
01-134192-030
BSCS-4B

Department of Computer Sciences
BAHRIA UNIVERSITY,
ISLAMABAD

Assignment # 2

Instructions

Please read the following instructions carefully before submitting assignment: It

should be clear that your assignment will not get any credit if:

- **The assignment is submitted after due date.**
- **The Assignment is plagiarized**

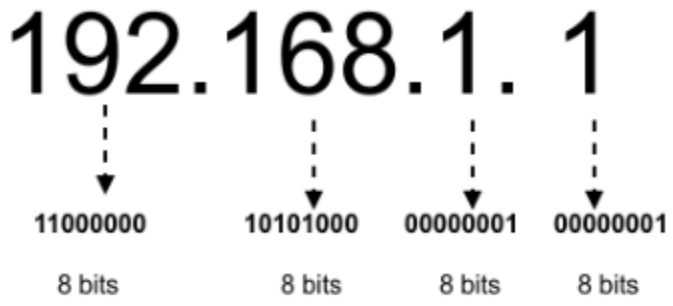
Q1: Introduction to IP Addressing (IPV4)

Answer:

IP ADDRESS - In real life IP ADDRESS is just like a home address which is used to know the exact location, or it serves as an identifier for my house. Same with Network Devices it serves as their identifier to communicate with other devices

In simple analogy *IP addressing* is used for identifying a certain *"group of networks" "group of computers"* and even *"individual devices"*. It serves as their identifiers or unique address to communicate with other devices. Every Device or Network Components has its own IP Address (just like our home, for the courier or delivery services to know our exact location).

Internet protocol version 4 in any network, is a standard protocol for assigning a logical address (IP address) to hosts. At present we are using the same protocol. It provides a unique address to the devices available in this world. Therefore, its advanced version IPV6 has been introduced, because IPV4 will no longer be used in future.
(ex. **IPV4→** 192.168.1.1) it consists of four group of numbers or decimals ranging (0-255) per group. It is divided by the period sign(.). each group are what we call *OCTET,* one octet is equivalent to 8 bits. So, an IPV4 Address has 32 bits in total.
The lower **IPV4 address** is represented in both binary and decimal form.
Binary: 11000000.10101000.00001010.00000001 Decimal: 192.168.10.1



Q2: IP Classes and their Ranges with example

IP Classes and their Ranges - In IPV4 we have 5 classes which are (class A, class B, class C, class D and class E) but only 3 classes are useable for end users which are (A, B and C). Class (D and E) are used for research purposes for the bigger companies

IP classes are categorized as follows:

- In class **A**, the first bit of the first byte always remains **OFF** (0).
- In class **B**, the first bit of the first byte always remains **ON** and the second bit of the first byte always remains **OFF**.
- In class **C**, the first two bits of the first byte always remain **ON** and the third bit of the first byte always remains **OFF**.
- In class **D**, the first three bits of the first byte always remain **ON** and the fourth bit of the first byte always remains **OFF**.
- In class **E**, the first four bits of the first byte always remain **ON.**

The IP ranges are as follows:

Class	IP Address Range (Theoretical)	Start-Bits	Application / Used for
A	**0.0.0.0 to 127.255.255.255**	**0**	**Very large networks**
B	**128.0.0.0 to 191.255.255.255**	**10**	**Medium networks**
C	**192.0.0.0 to 223.255.255.255**	**110**	**Small networks**
D	**224.0.0.0 to 239.255.255.255**	**1110**	**Multicast**
E	**240.0.0.0 to 247.255.255.255**	**1111**	**Experimental**

These are used for special purposes.

Q3: Public and Private IP address with example

Public and Private IP address - Private IP address is the address what we used inside our network or privately used by us or by our organization.

When we say Public IP address these are the one used outside our network or through Internet.

Take note that Private IP will not work outside our network as it is used only inside our network this, we have private and public IP assign Addresses

PRIVATE IP

Class A (10.0.0.0 - 10.255.255.255)

Class B (172.16.0.0 - 172.31.255.255)

Class C (192.168.0.0 - 192.168.255.255)

PUBLIC IP

Class A (1.0.0.0 - 9.255.255.255) (11.0.0.0 - 126.255.255.255)

Class B (128.16.0.0 - 172.255.255.255) (172.32.0.0 - 191.255.255.255)

Class C (192.0.0.0 - 192.167.255.255) (192.169.0.0 - 223.255.255.255)

OTHER IP

0.0.0.0 - used for default routing

127.x.x.x - used for loopbacks