PRACTICAL NO. 07

AIM OF PRACTICAL :

Write a C Program to translate Dotted Decimal IP Address into 32 Bit Binary Address

LEARNING OBJECTIVES: -

1. To know translation of IP addresses.
2. To know 32 bit IP addressing sytem.

LEARNING OUTCOMES: -

1. To implement a C program to translate Dotted Decimal IP Address into 32 Bit Binary Address.
2. To apply the operation of dotted decimal into 32 Binary bit address.

After studying this practical students are able to:

1. To know IP addressing in detail.
2. To know IP addressing for setting up network.

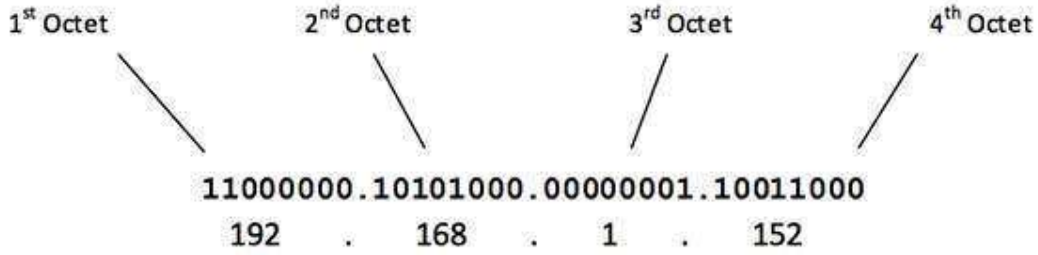
SOFTWARE REQUIRED:-

SN	Name of Equipment/ Items / Software Tool	Specification	Qty Required
1.	Hardware : Computer System	Computer (i3-i5 preferable) , RAM minimum 2GB onwards	**As per batch size**
2.	Operating System	Windows 7 or Later Version / LINUX version 5.0 or Later Version	
3	Software	Turbo C/ C++ Version 3.0 or Later Version	

THEORY-

Internet Protocol hierarchy contains several classes of IP Addresses to be used efficiently in various situations as per the requirement of hosts per network. Broadly, the IPv4 Addressing system is divided into five classes of IP Addresses. All the five classes are identified by the first octet of IP Address.

The first octet referred here is the left most of all. The octets numbered as follows depicting dotted decimal notation of IP Address −



The number of networks and the number of hosts per class can be derived by this formula −

Number of networks	= 2^network_bits
Number of Hosts/Network	= 2^host_bits – 2

Class A Address

The first bit of the first octet is always set to 0 (zero). Thus the first octet ranges from 1 – 127, i.e.

```
00000001 - 01111111
       1 - 127
```

Class A addresses only include IP starting from 1.x.x.x to 126.x.x.x only. The IP range 127.x.x.x is reserved for loopback IP addresses.

The default subnet mask for Class A IP address is 255.0.0.0 which implies that Class A addressing can have 126 networks (2^7-2) and 16777214 hosts (2^{24}-2).

Class A IP address format is
thus: 0NNNNNNN.HHHHHHHH.HHHHHHHH.HHHHHHHH

Class B Address

An IP address which belongs to class B has the first two bits in the first octet set to 10, i.e.

```
10000000 - 10111111
     128 - 191
```

Class B IP Addresses range from 128.0.x.x to 191.255.x.x. The default subnet mask for Class B is 255.255.x.x.

Class B has 16384 (2^{14}) Network addresses and 65534 (2^{16}-2) Host addresses.

Class B IP address format
is: 10NNNNNN.NNNNNNNN.HHHHHHHH.HHHHHHHH

Class C Address

The first octet of Class C IP address has its first 3 bits set to 110, that is −

```
11000000 - 11011111
     192 - 223
```

Class C IP addresses range from 192.0.0.x to 223.255.255.x. The default subnet mask for Class C is 255.255.255.x.

Class C gives 2097152 (2^{21}) Network addresses and 254 (2^{8}-2) Host addresses.

Class C IP address format
is: 110NNNNN.NNNNNNNN.NNNNNNNN.HHHHHHHH

Class D Address

Very first four bits of the first octet in Class D IP addresses are set to 1110, giving a range of −

```
11100000 - 11101111
     224 - 239
```

Class D has IP address range from 224.0.0.0 to 239.255.255.255. Class D is reserved for Multicasting. In multicasting data is not destined for a particular host, that is why there is no need to extract host address from the IP address, and Class D does not have any subnet mask.

Class E Address

This IP Class is reserved for experimental purposes only for R&D or Study. IP addresses in this class ranges from 240.0.0.0 to 255.255.255.254. Like Class D, this class too is not equipped with any subnet mask.

OBSERVATION TABLE/PROGRAMMING/SIMULATION MODEL:

OUTPUT / RESULTS & ANALYSIS:

LIST OF PRE-LAB QUESTIONS/MODEL ANSWERS:

1 What is the length of IPV4 address?

Ans

2 What is the length of IPV6 address?

Ans

3 What is the Difference between IPV4 and IPV6?

Ans

4 What is the Features of IPv4?

Ans

5 What is the Features of IPv6?

Ans

LIST OF POST-LABQUESTIONS/MODEL ANSWERS:

(Based on results/ Output)

1 What is IPv4?

Ans

2 What is Network part of ipv4?

Ans

3 What is Subnet number?

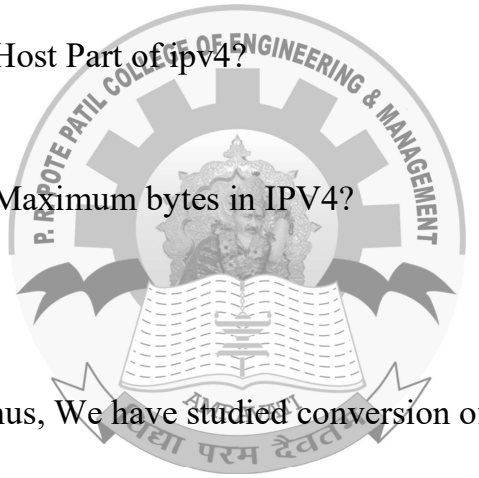
Ans

4 What is Host Part of ipv4?

Ans

5 What is Maximum bytes in IPV4?

Ans



CONCLUSION:-Thus, We have studied conversion of dotted decimal IP address to binary

ASSESSMENT SCHEME:-

Pre-Lab Test (2)	**In Lab performance (5)**	**Post Lab Test (3)**	**Record (5)**	**Total (15)**