**EX.NO:7 IMPLEMENTATION OF SUBNETTING**

**SOURCE CODE**

import java.util.Scanner;

class Subnet{

public static void main(String args[]){

Scanner sc = new Scanner(System.in);

System.out.print("Enter the ip address: ");

String ip = sc.nextLine();

String split\_ip[] = ip.split("\\."); //SPlit the string after every .

String split\_bip[] = new String[4]; //split binary ip

String bip = "";

for(int i=0;i<4;i++){

split\_bip[i] = appendZeros(Integer.toBinaryString(Integer.parseInt(split\_ip[i]))); // “18” => 18 => 10010 => 00010010

bip += split\_bip[i];

}

System.out.println("IP in binary is "+bip);

System.out.print("Enter the number of addresses: ");

int n = sc.nextInt();

//Calculation of mask

int bits = (int)Math.ceil(Math.log(n)/Math.log(2)); /\*eg if address = 120, log 120/log 2 gives log to the base 2 => 6.9068, ceil gives us upper integer \*/

System.out.println("Number of bits required for address = "+bits);

int mask = 32-bits;

System.out.println("The subnet mask is = "+mask);

//Calculation of first address and last address

int fbip[] = new int[32];

for(int i=0; i<32;i++) fbip[i] = (int)bip.charAt(i)-48; //convert cahracter 0,1 to integer 0,1

for(int i=31;i>31-bits;i--)//Get first address by ANDing last n bits with 0

fbip[i] &= 0;

String fip[] = {"","","",""};

for(int i=0;i<32;i++)

fip[i/8] = new String(fip[i/8]+fbip[i]);

System.out.print("First address is = ");

for(int i=0;i<4;i++){

System.out.print(Integer.parseInt(fip[i],2));

if(i!=3) System.out.print(".");

}

System.out.println();

int lbip[] = new int[32];

for(int i=0; i<32;i++) lbip[i] = (int)bip.charAt(i)-48; //convert cahracter 0,1 to integer 0,1

for(int i=31;i>31-bits;i--)//Get last address by ORing last n bits with 1

lbip[i] |= 1;

String lip[] = {"","","",""};

for(int i=0;i<32;i++)

lip[i/8] = new String(lip[i/8]+lbip[i]);

System.out.print("Last address is = ");

for(int i=0;i<4;i++){

System.out.print(Integer.parseInt(lip[i],2));

if(i!=3) System.out.print(".");

}

System.out.println();

}

static String appendZeros(String s){

String temp = new String("00000000");

return temp.substring(s.length())+ s;

}

}

**SAMPLE INPUT & OUTPUT**

C:\>javac Subnet.java

C:\>java Subnet

Enter the ip address: 100.110.150.10

IP in binary is 01100100011011101001011000001010

Enter the number of addresses: 7

Number of bits required for address = 3

The subnet mask is = 29

First address is = 100.110.150.8

Last address is = 100.110.150.15