PRACTICAL:2

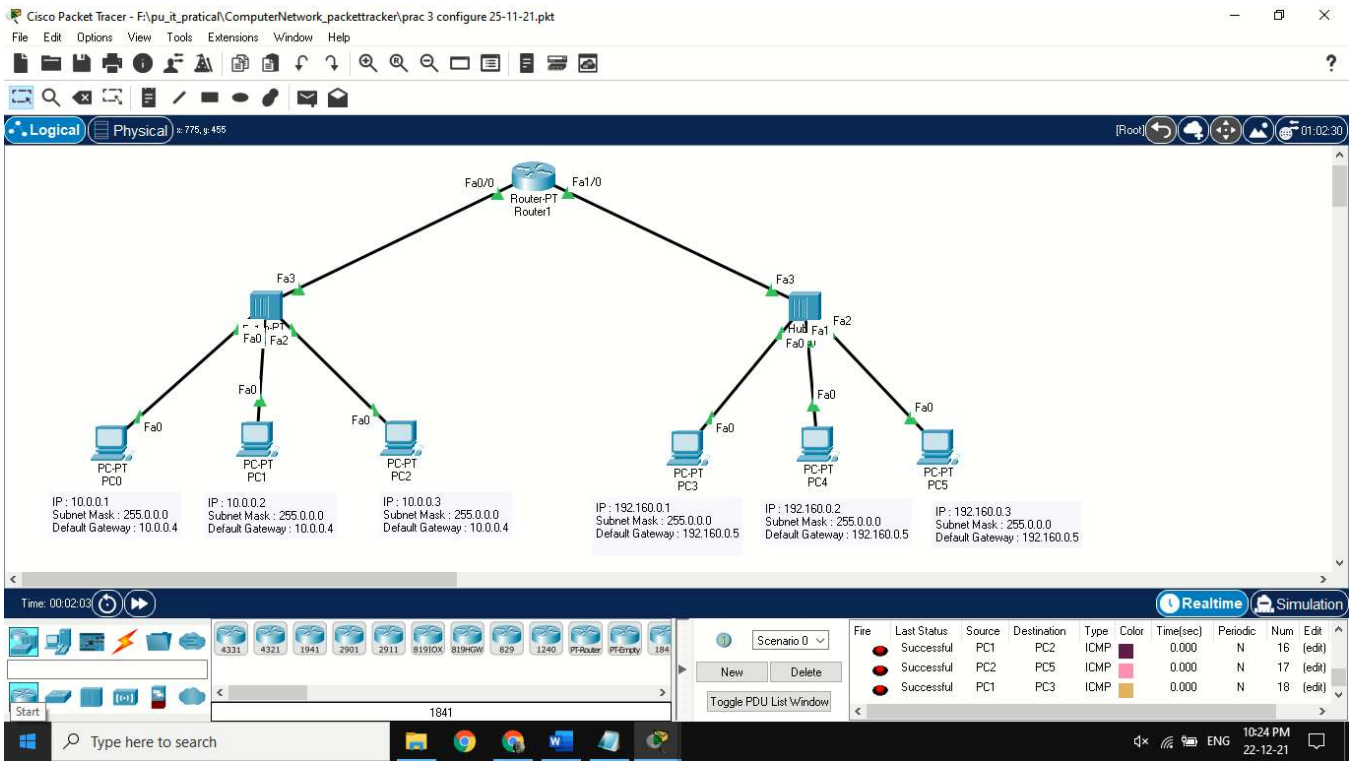
AIM: Make a connection using Router.

Theory:

➢ IP address Range:

1. Class A:- 0 - 127
   N.H.H.H n=8, h=24
   Subnet mask is 255.0.0.0
2. Class B:- 128-191
   N.N.H.H n=16, h=16
   Subnet mask is 255.255.0.0
3. Class C:- 192 – 223
   N.N.N.H n=24, h=8
   Subnet mask is 255.255.255.0
4. Class D:- 224 - 239 (multicasting)
5. Class E:- 240 - 255 (experiment)

➢ Implementation:



- **Steps to connect router with switches.**

1. Then assign IP address to all the PC.
2. Then click on router and go to CLI(command line interface).
3. When you see “would you like to enter initial configuration dialog?” Type n and press enter key.
4. Write enable
5. Write configure
6. Write terminal
7. Write hostname Hemil
8. Write Interface giga 0/0/0
9. Write Ip address 10.0.0.9 255.255.255.0
10. Write no shut
11. Then write exit
12. Write interface giga0/0/1
13. Write ip address 192.0.0.9 255.255.255.0
14. Write no shut.
15. Now connection between two switches has been made, and now to transport data from pc0 to pc6
16. Write their side of ip address of router in the default gateway in the config.

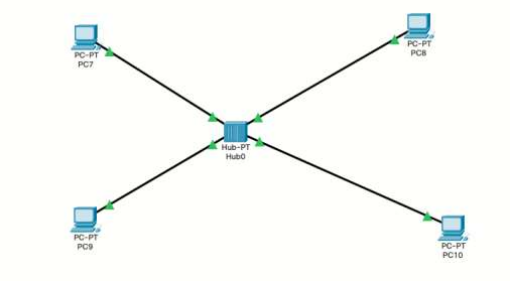
PRACTICAL:3

AIM: To study behaviour of generic devices used for networking.

Theory:

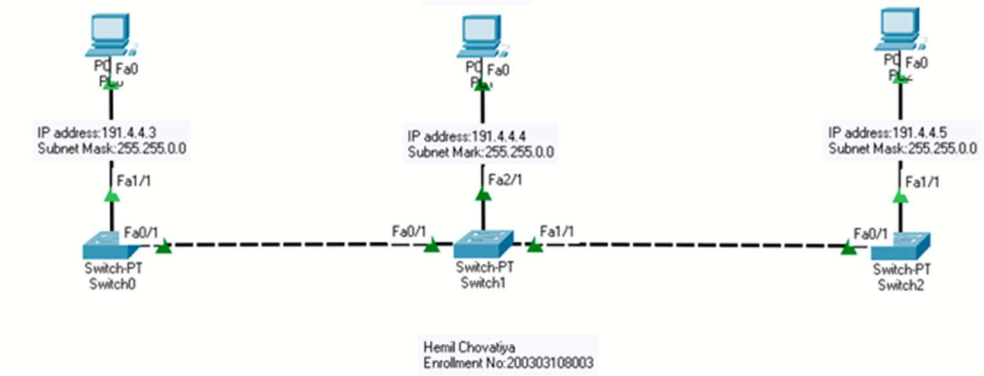
Hub: -

A hub is basically a multiport repeater. A hub connects multiple wires coming from different branches, for example, the connector in star topology which connects different stations. Hubs cannot filter data, so data packets are sent to all connected devices. In other words, collision domain of all hosts connected through Hub remains one. Also, they do not have intelligence to find out best path for data packets which leads to inefficiencies and wastage.



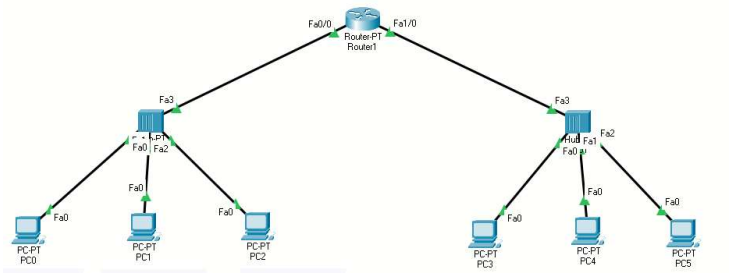
Switches:-

Switches are key building blocks for any network. They connect multiple devices, such as computers, wireless access points, printers, and servers; on the same network within a building or campus.



Router: -

Router is a hardware which is used for sharing internet access through sharing networks within local area. These routers have designed with the potential to transfer signals from a single point to the multiple exact destinations. It is essential to get a router for sharing your application and internet within your LAN



Gate Way:

In a communications network, a network node equipped for interfacing with another network that uses different protocols.

- A gateway may contain devices such as protocol translators, impedance matching devices, rate converters, fault isolators, or signal translators as necessary to provide system interoperability. It also requires the establishment of mutually acceptable administrative procedures between both networks.
- A protocol translation/mapping gateway interconnects networks with different network protocol technologies by performing the required protocol conversions.

Bridge:

A network bridge connects multiple network segments at the data link layer (Layer 2) of the OSI model. In Ethernet networks, the term bridge formally means a device that behaves according to the IEEE 802.1D standard. A bridge and switch are very much alike; a switch being a bridge with numerous ports. Switch or Layer 2 switch is often used interchangeably with bridge. Bridges can analyse incoming data packets to determine if the bridge is able to send the given packet to another segment of the network.

Repeater:

Functioning at Physical Layer. A repeater is an electronic device that receives a signal and retransmits it at a higher level and/or higher power, or onto the other side of an obstruction, so that the signal can cover longer distances. Repeater have two ports, so cannot be use to connect for more than two devices

PRACTICAL:4

AIM: To study of Hamming code.

Theory:

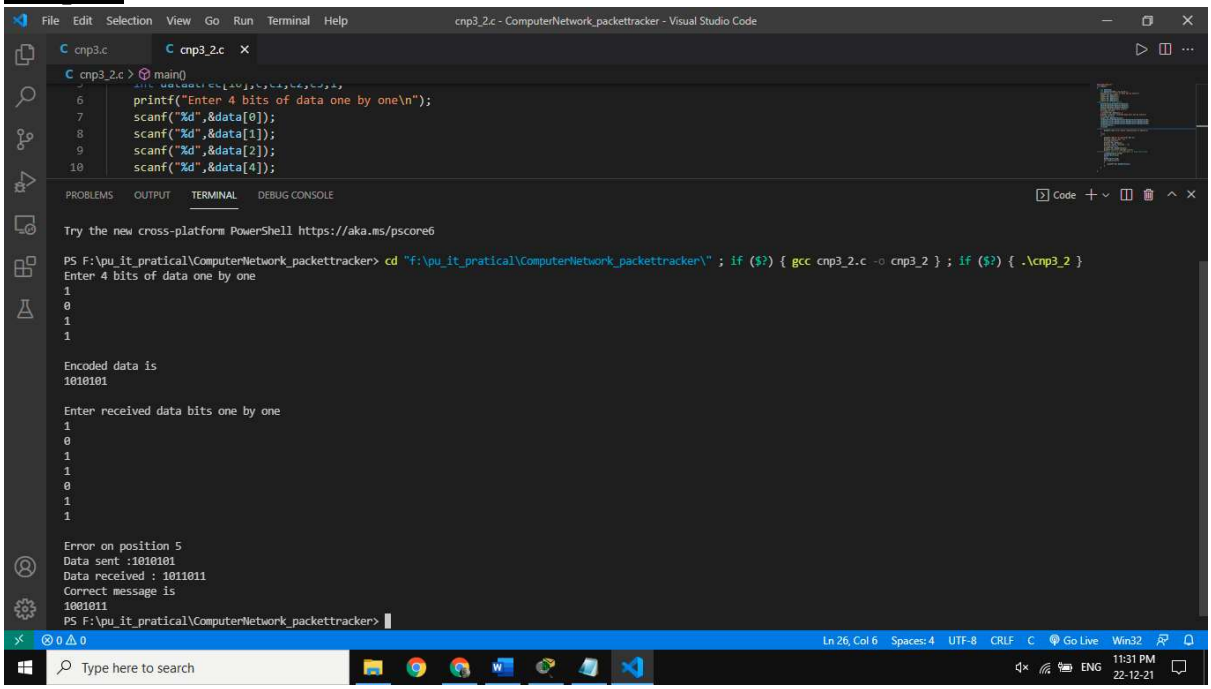
Hamming code is a set of error-correction codes that can be used to detect and correct the errors that can occur when the data is moved or stored from the sender to the receiver. Hamming code is a set of error-correction codes that can be used to detect and correct the errors that can occur when the data is moved or stored from the sender to the receiver. There are seven bits where 1st, 2nd and 4th bits are parity (even parity here) bits and others are data bits. Where 1st bit depends on 3rd, 5th, 7th bit. 2nd bit depends on 3rd, 6th, 7th bit. 3rd bit depends on 5th, 6th, 7th bit.

Code:

```
#include<stdio.h>
void main()
{
   int data[10];
   int dataatrec[10],c,c1,c2,c3,i;
   printf("Enter 4 bits of data one by one\n");
   scanf("%d",&data[0]);
   scanf("%d",&data[1]);
   scanf("%d",&data[2]);
   scanf("%d",&data[4]);
//Calculation of even parity
   data[6]=data[0]^data[2]^data[4];
   data[5]=data[0]^data[1]^data[4];
   data[3]=data[0]^data[1]^data[2];
   printf("\nEncoded data is\n");
   for(i=0;i<7;i++)
   { printf("%d",data[i]); }
   printf("\n\nEnter received data bits one by one\n");
   for(i=0;i<7;i++)
   scanf("%d",&dataatrec[i]);
   c1=dataatrec[6]^dataatrec[4]^dataatrec[2]^dataatrec[0];
   c2=dataatrec[5]^dataatrec[4]^dataatrec[1]^dataatrec[0];
   c3=dataatrec[3]^dataatrec[2]^dataatrec[1]^dataatrec[0];
   c=c3*4+c2*2+c1 ;
   if(c==0)
   {
      printf("\nNo error while transmission of data\n");
```

```
    }
     else
    {
        printf("\nError on position %d",c);
        printf("\nData sent :");
        for(i=0;i<7;i++)
        printf("%d",data[i]);
        printf("\nData received : ");
        for(i=0;i<7;i++)
        printf("%d",dataatrec[i]);
        printf("\nCorrect message is\n");
//if errorneous bit is 0 we complement it else vice versa
        if(dataatrec[7-c]==0)
        dataatrec[7-c]=1;
        else
        dataatrec[7-c]=0;
        for (i=0;i<7;i++)
        {
            printf("%d",dataatrec[i]);
        }
    }
}
```

Output:



PRACTICAL:5

AIM: : Create a VLAN on CISCO PACKET TRACER.

Theory:

A VLAN (virtual LAN) is a subnetwork which can virtually group together collections of devices on separate physical local area networks (LANs).

Steps:

1. First make a network as in the photo, and give IP address from same class to all the PCs.
2. Then click on switch 1 and go to CLI and take following steps
en > config terminal > vlan 5 > name vlan5 > exit > vlan 6 > name vlan6>exit
3. Do the same for switch 2.
4. Click on switch 1 and go to CLI and set every PC to the VLAN from vlan 5 or vlan 6. i.e. **en> config terminal > interface fastethernet 0/1 > sw a vlan 6 > exit.**
5. To successfully connect two switches take following steps in CLI of both switches.i.e. **en > config terminal > interface fastethernet 0/5 > switch m t > switch non>exit.**

After this process even if PCs are in physical connection they won't be able to transfer packet.

Implementation: