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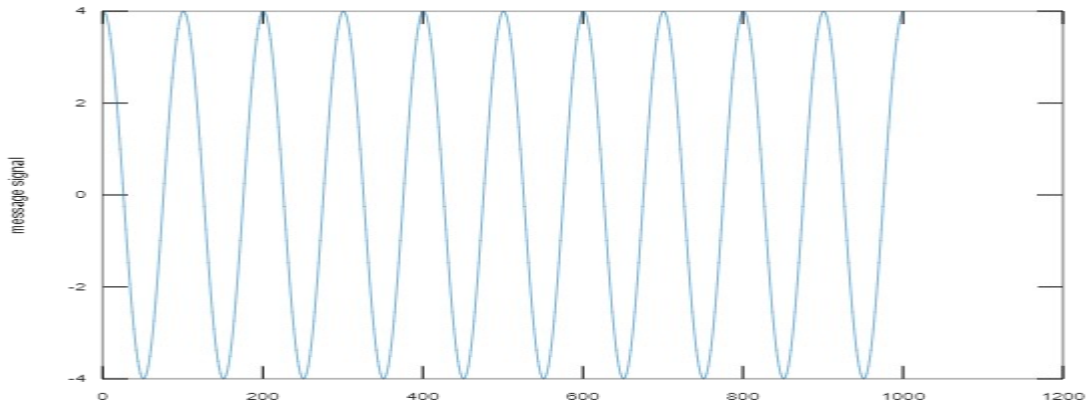
Exam Code: E2954

Assignment

Message **signal:**

```
t=0:.001:1;
% Plot sine and cosine graph
a=input("Enter the amplitude of the signal")
f=input("Enter the frequency of the signal")
m=a*cos(2*pi*f*t)
plot(m)
ylabel("message signal")
xlabel(“time”)
```

input=4,10



Plot AM signal(Amplitude Modulated signal):

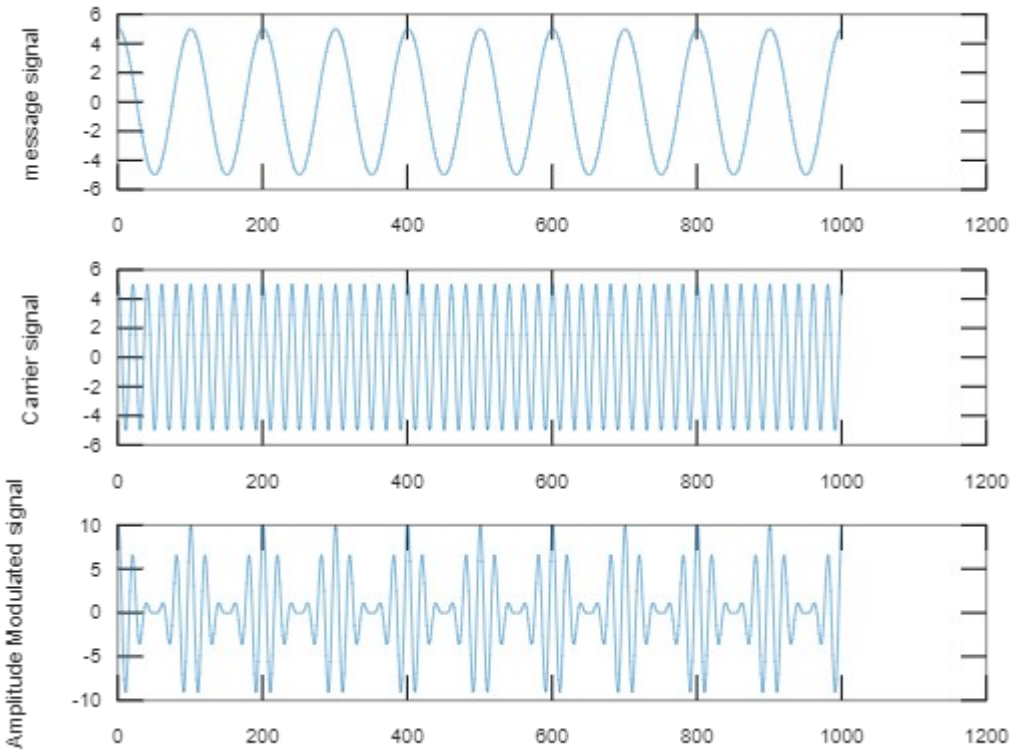
Am signal is the modified carrier signal

** Ac >> Fc

```
t=0:.001:1;
% Plot sine and cosine graph
Am=input("Enter the amplitude of the message signal")
Fm=input("Enter the frequency of the message signal")
m=Am*cos(2*pi*Fm*t)
subplot(3,1,1)
plot(m)
ylabel("message signal")
%xlabel(“time”)

Ac=input("Enter the amplitude of the carrier signal")
Fc=input("Enter the frequency of the carrier signal")
c=Ac*cos(2*pi*Fc*t)
subplot(3,1,2)
```

```
plot(c)
ylabel("Carrier signal")
%xlabel(“time”)

AM=(Ac+m).*cos(2*pi*Fc*t);
subplot(3,1,3)
plot(AM)
ylabel("Amplitude Modulated signal")
%xlabel(“time”)plot(m)
ylabel("message signal")
xlabel(“time”)

Ac=input("Enter the amplitude of the carrier signal")
Fc=input("Enter the frequency of the carrier signal")
c=Ac*cos(2*pi*Fc*t)
subplot(3,1,2)
plot(c)
ylabel("Carrier signal")
xlabel(“time”)
```

** Inputs:(5,10),(5,50)



There are three types of modulation:

1) Over modulated (input:(10,5),(100,3))
2) Under modulated (input:(10,5),(100,10))
3) Critically modulated (input:(10,5),(100,5))

**

μ = Am/Ac called modulatation index
Am=Amplitude of message signal
Ac = Amplitude of carrier signal

** If μ < 1 → under modulation

μ = 1 → Critical Modulation

μ > 1 → Over Modulation

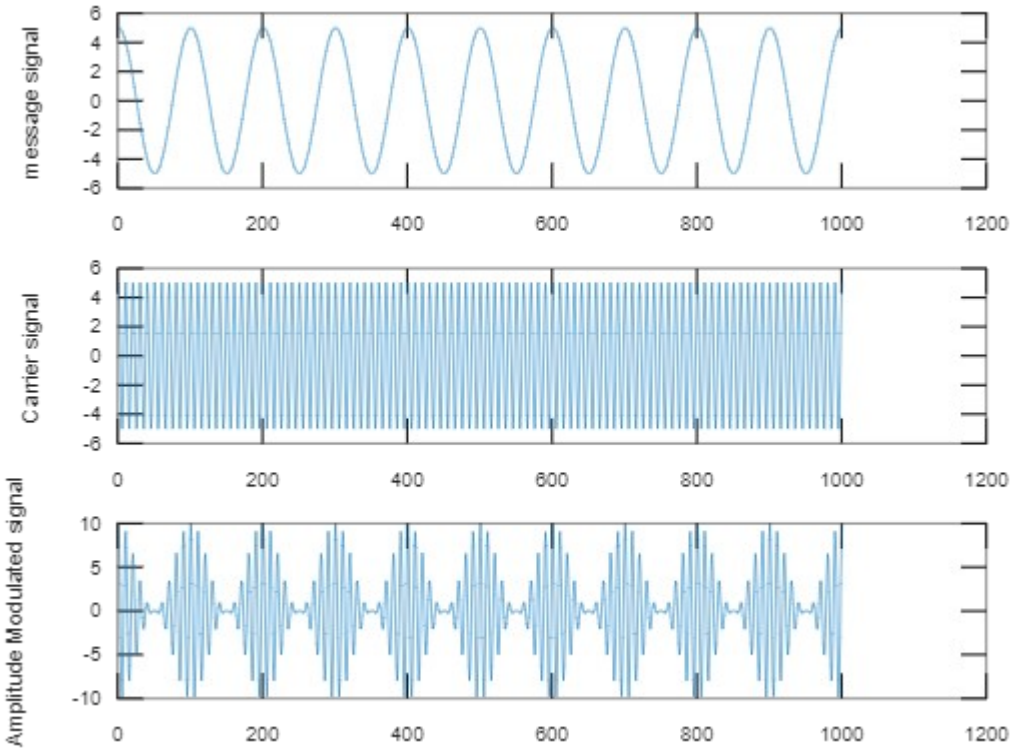
we do not prefer u>1 in real life because we have to face

certain distortion(error is happening in the reciver end).So we always prefer μ<=1

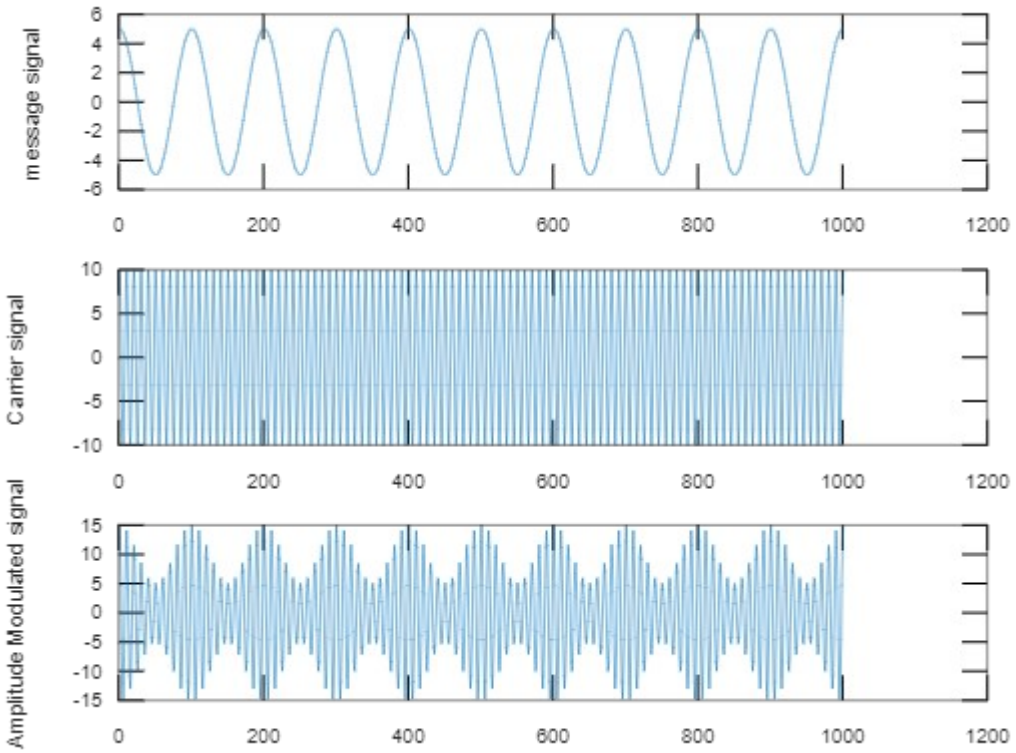
code:(same for three of them)

```
t=0:.001:1;
% Plot sine and cosine graph
Fm=input("Enter the frequency of the message signal")
Am=input("Enter the amplitude of the message signal")
m=Am*cos(2*pi*Fm*t)
subplot(3,1,1)
plot(m)
ylabel("message signal")
%xlabel(“time”)

Fc=input("Enter the frequency of the carrier signal")
Ac=input("Enter the amplitude of the carrier signal")

c=Ac*cos(2*pi*Fc*t)
subplot(3,1,2)
plot(c)
ylabel("Carrier signal")
%xlabel(“time”)

AM=(Ac+m).*cos(2*pi*Fc*t);
subplot(3,1,3)
plot(AM)
ylabel("Amplitude Modulated signal")
%xlabel(“time”)
```

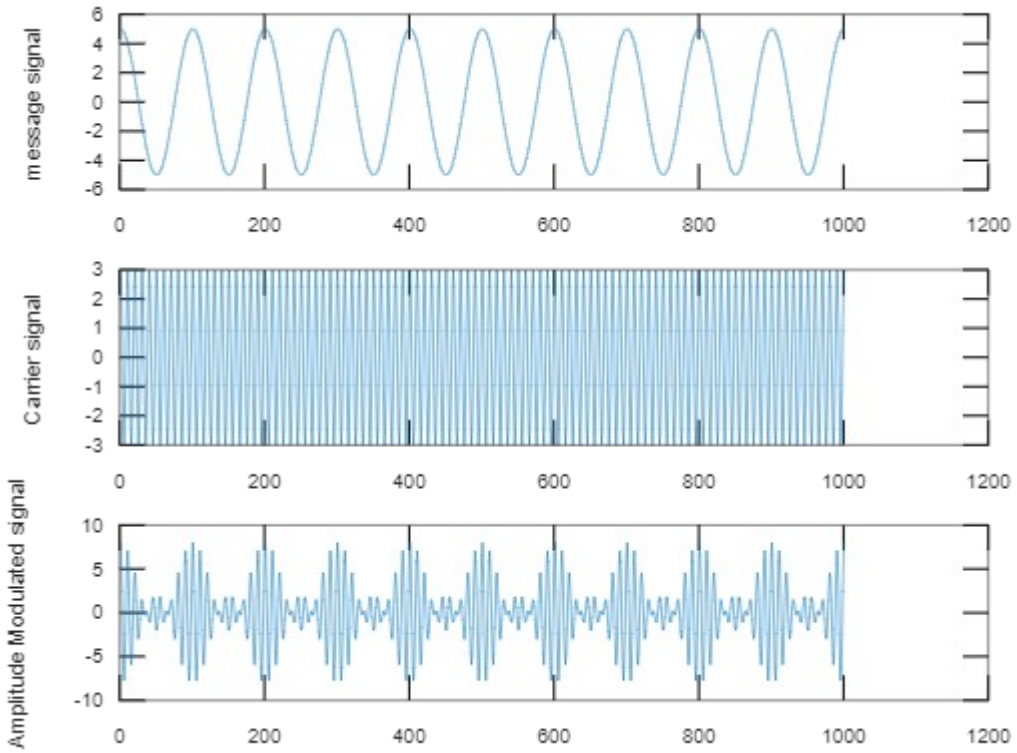
Critically modulated(Am=Ac)



Under modulated (Am<Ac)



Over modulated (Am>Ac)



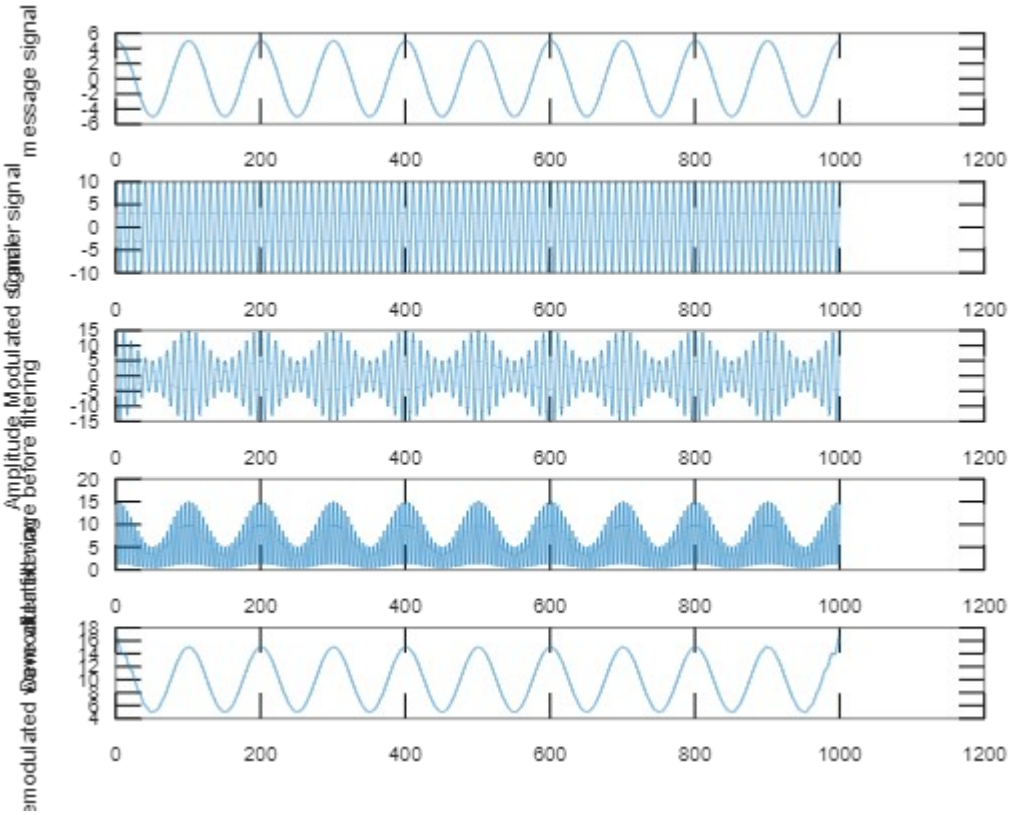
AM Demodulation

Input:(10,5),(100,10)

Code:

```
t=0:.001:1;
% Plot sine and cosine graph
Fm=input("Enter the frequency of the message signal")
Am=input("Enter the amplitude of the message signal")
m=Am*cos(2*pi*Fm*t)
subplot(5,1,1)
plot(m)
ylabel("message signal")
%xlabel(“time”)

Fc=input("Enter the frequency of the carrier signal")
Ac=input("Enter the amplitude of the carrier signal")

c=Ac*cos(2*pi*Fc*t)
subplot(5,1,2)
plot(c)
ylabel("Carrier signal")
%xlabel(“time”)

AM=(Ac+m).*cos(2*pi*Fc*t);
subplot(5,1,3)
plot(AM)
ylabel("Amplitude Modulated signal")
```

```
%xlabel(“time”)

DEMOD=AM.*cos(2*pi*Fc*t)
subplot(5,1,4)
plot(DEMOD)
ylabel('Demodulated wave before filtering')

envelope=abs(hilbert(AM))
subplot(5,1,5)
plot(envelope)
ylabel('Demodulated wave after filtering')
```



Experiment-2

Experiment of Frequency Modulated Signal

Q1) Why we prefer FM over AM ?

Ans) Because Noise immunity is very very high.

Advantages of FM:

1.Less interference and noise

2.Power consumption is less as compared to AM

3.Adjacent FM channels are separated by guard bands.

Disadvantages of FM:

1.Equipment cost is higher and has a large bandwidth.

2.The receiving are of FM signal is small

3.The antennas for FM systems should be kept close for Better consumtion.

Modulation index of FM is β = k*Am/Wm

If β > wideband FM

B < Narrowband FM

Code:

```
t=0:.001:1;
beta = input("enter the value of modulation index")

Fm=input("Enter the frequency of the message signal")
Am=input("Enter the amplitude of the message signal")
m=Am*cos(2*pi*Fm*t)
```

```
subplot(3,1,1)
plot(m)
ylabel("message signal")
%xlabel(“time”)



Fc=input("Enter the frequency of the carrier signal")
Ac=input("Enter the amplitude of the carrier signal")
c=Ac*cos(2*pi*Fc*t)
subplot(3,1,2)
plot(c)
ylabel("Carrier signal")
%xlabel(“time”)

FM=Ac*cos(2*pi*Fc*t+beta*sin(2*pi*Fm*t))
subplot(3,1,3)
plot(FM)
ylabel("Frequency modulated signal")
```

Experiment-3

Study of Generation of Amplitude Shift Keying (ASK) Signal

Encoding techniques:

1) Amplitude shift keying(ASK) (also known as ook=on off keying)
2) Frequency shift keying(FSK)(BFSK= Binary frequency shift keying)
3) Phase shift keying(PSK)

→In an ASK system,binary symbol 1 is represented by transmitting carrier wave of fixed amplitude and fixed frequency for the bit duration T second.

→The binary symbol 0 will be represented by not transmitting any wave for another bit duration T second.

FSK:

→Less susceptible to error than ASK.

→used for upto 1200bps on voice grade lines.

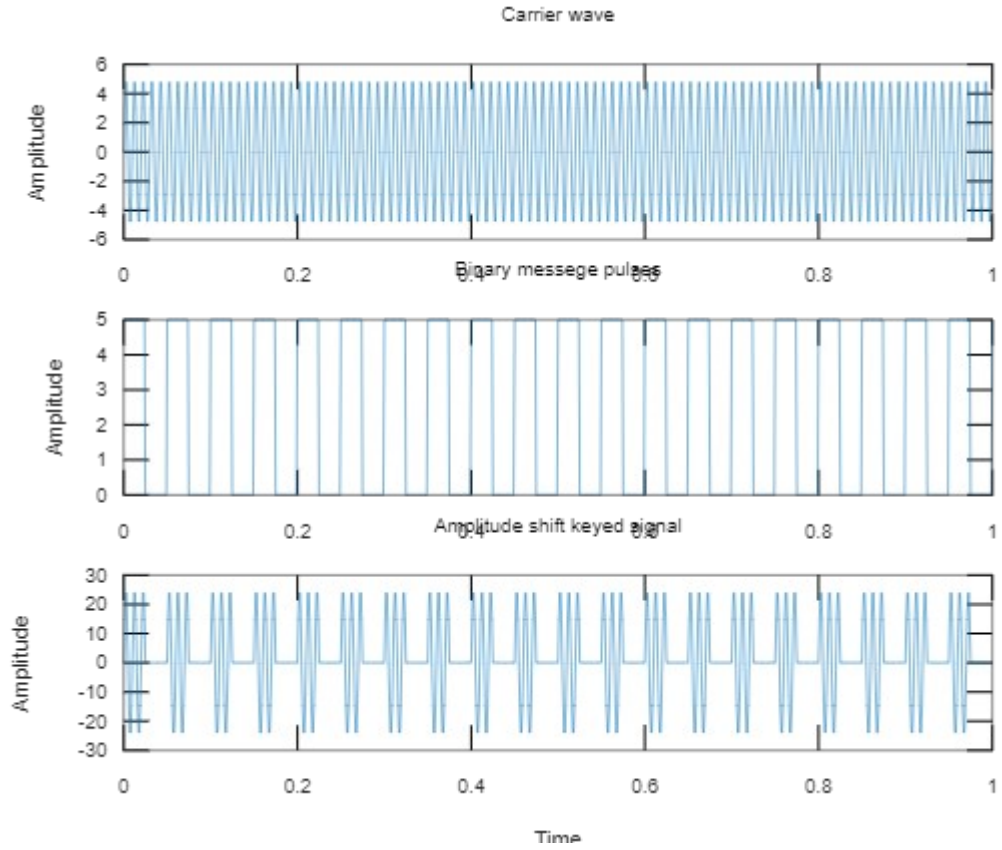
→high frequency radio

→even higher frequency on LANs using co-axial cable

ASK=Input(100,20,5)

Code:

```
fc=input('Enter the fequency of sive wave carrier');
fp=input('Enter the frequency of peeiodic binary pulse(Messege):');
amp=input('Enter the amplitude (for carrier & binary pulse
messege');

t=0:0.001:1;
c=amp.*sin(2*pi*fc*t);
subplot(3,1,1)
plot(t,c)
xlabel('Time')
ylabel('Amplitude')
title('Carrier wave')

m=amp/2.*square(2*pi*fp*t)+(amp/2)
subplot(3,1,2)
plot(t,m)
xlabel('Time')
ylabel('Amplitude')
title('Binary messege pulses')

w=c.*m;
subplot(3,1,3)
plot(t,w)
xlabel('Time')
ylabel('Amplitude')
title('Amplitude shift keyed signal')
```



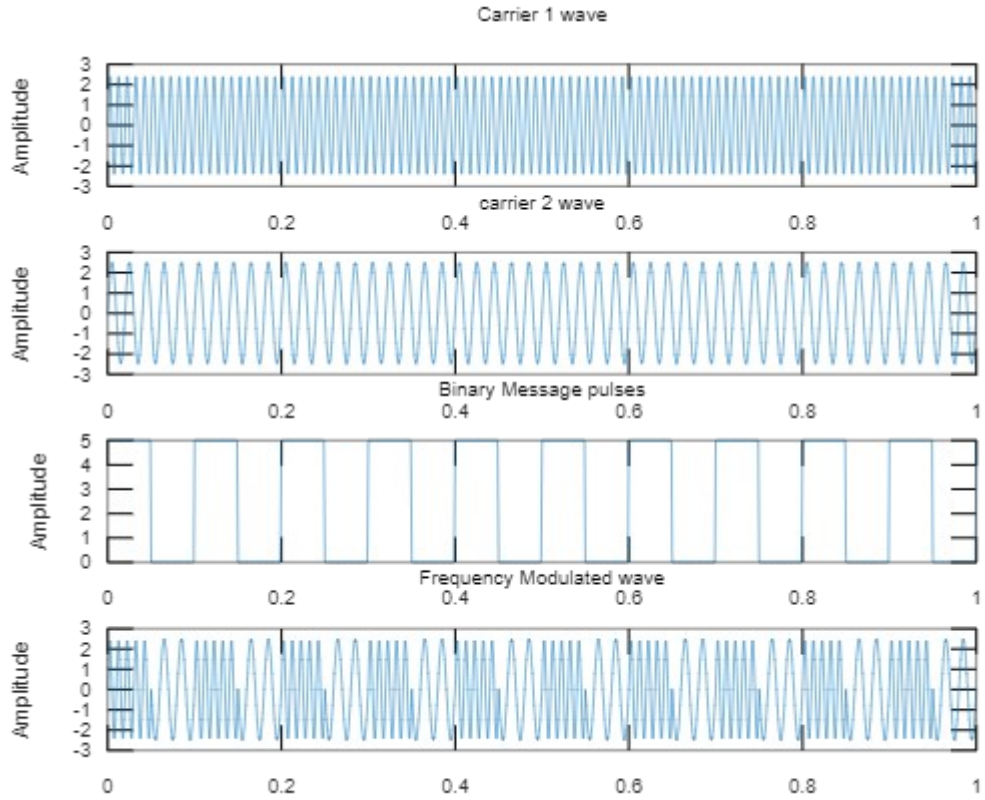
FSK(Frequency Modulated Signal)

Input: (!00,50,10,5)

Code:

```
fc1=input("Enter the frequency of 1st sine wave carrier");
fc2=input("Enter the frequency of 2nd sine wave carrier");
fp=input("Enter the frequency of periodic Binary pulse (Message):");

amp=input("Enter the amplitude (For both carrier & Binary Pulse
message");

amp=amp/2
t=0:0.001:1;%for setting the sampling signal
c1=amp.*sin(2*pi*fc1*t);%for generating 1st carrier sine wave
c2=amp.*sin(2*pi*fc2*t);%for generating 2nd carrier sine wave
subplot(4,1,1);
```

```
plot(t,c1)
ylabel('Amplitude')
title('Carrier 1 wave')

subplot(4,1,2)
plot(t,c2)
ylabel("Amplitude")
title('carrier 2 wave')

m=amp.*square(2*pi*fp*t)+amp;%for generating square wave message
subplot(4,1,3)
plot(t,m)
ylabel('Amplitude')
title('Binary Message pulses')

for i=0:1000
    if m(i+1)==0
        mm(i+1)=c2(i+1);
    else
        mm(i+1)=c1(i+1);
    end
end

subplot(4,1,4)
plot(t,mm)
ylabel('Amplitude')
title('Frequency Modulated wave')
```



PSK(Phase shift keying)

Input: [0 1 0 0 1 1 1 0]

Code: clear;

clc;

b = input('Enter the Bit stream \n '); %b = [0 1 0 1 1 1 0];

n = length(b);

t = 0:.01:n;

x = 1:1:(n+1)*100;

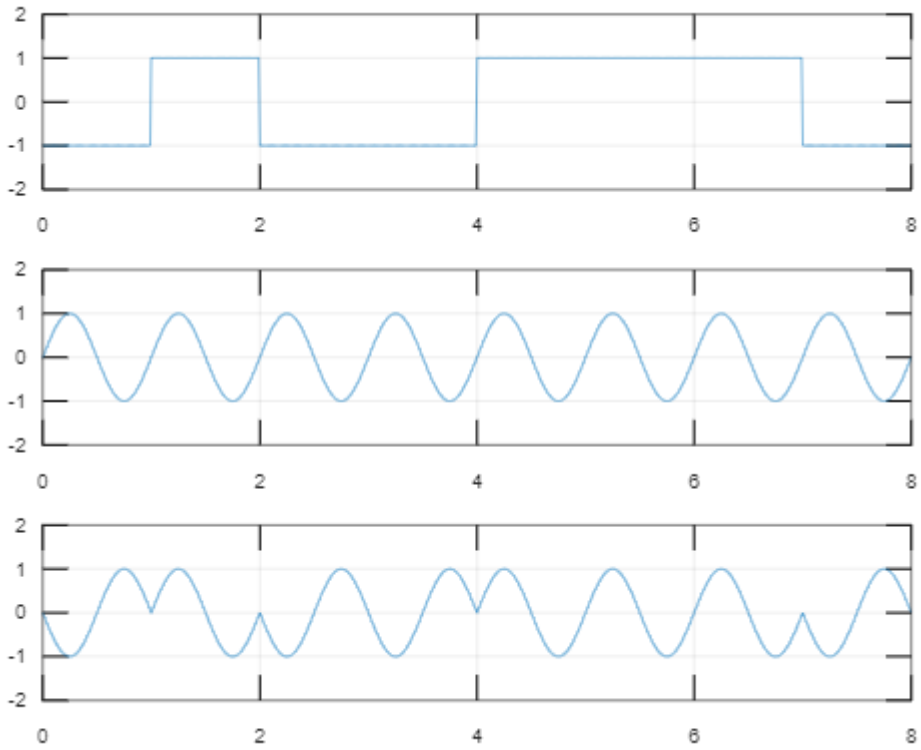
for i = 1:n

if (b(i) == 0)

b_p(i) = -1;

else

```
b_p(i) = 1;
end
for j = i:.1:i+1
bw(x(i*100:(i+1)*100)) = b_p(i);
end
end
bw = bw(100:end);
sint = sin(2*pi*t);
st = bw.*sint;
subplot(3,1,1)
plot(t,bw)
grid on ; axis([0 n -2 +2])
subplot(3,1,2)
plot(t,sint)
grid on ; axis([0 n -2 +2])
subplot(3,1,3)
plot(t,st)
grid on ; axis([0 n -2 +2])
```

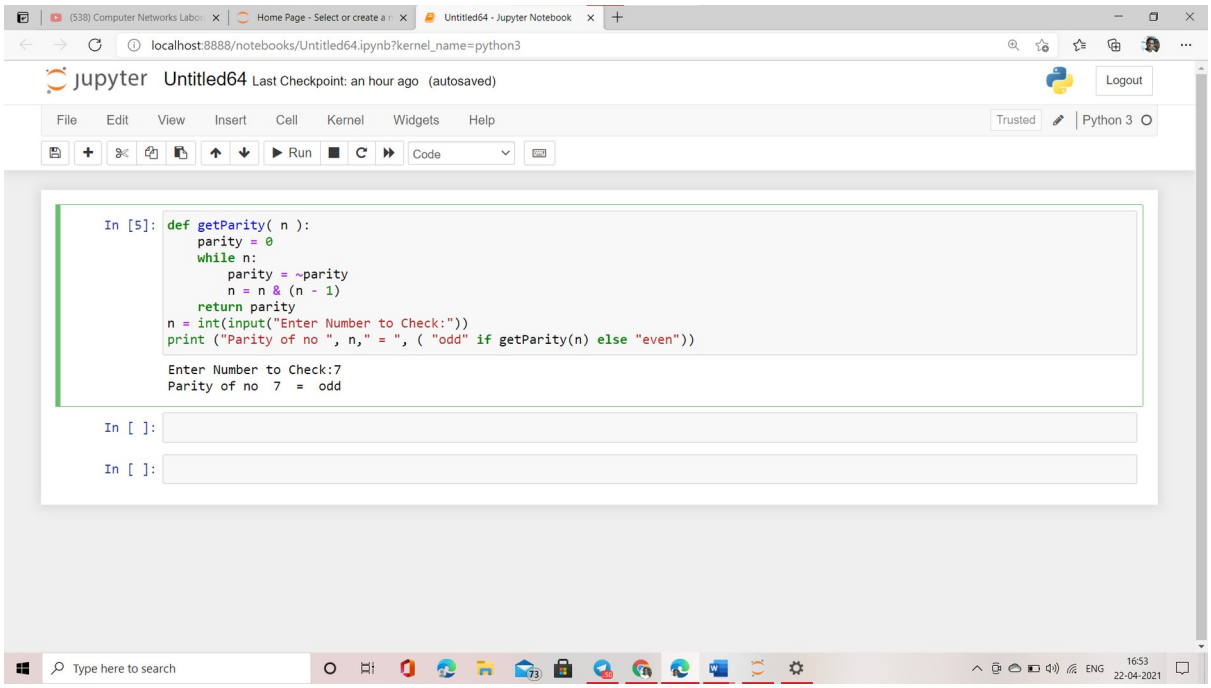


1.Check parity

Code:

```
def getParity( n ):
    parity = 0
    while n:
        parity = ~parity
        n = n & (n - 1)
    return parity
n = int(input("Enter Number to Check:"))
print ("Parity of no ", n," = ", ( "odd" if getParity(n) else "even"))
```

Output:



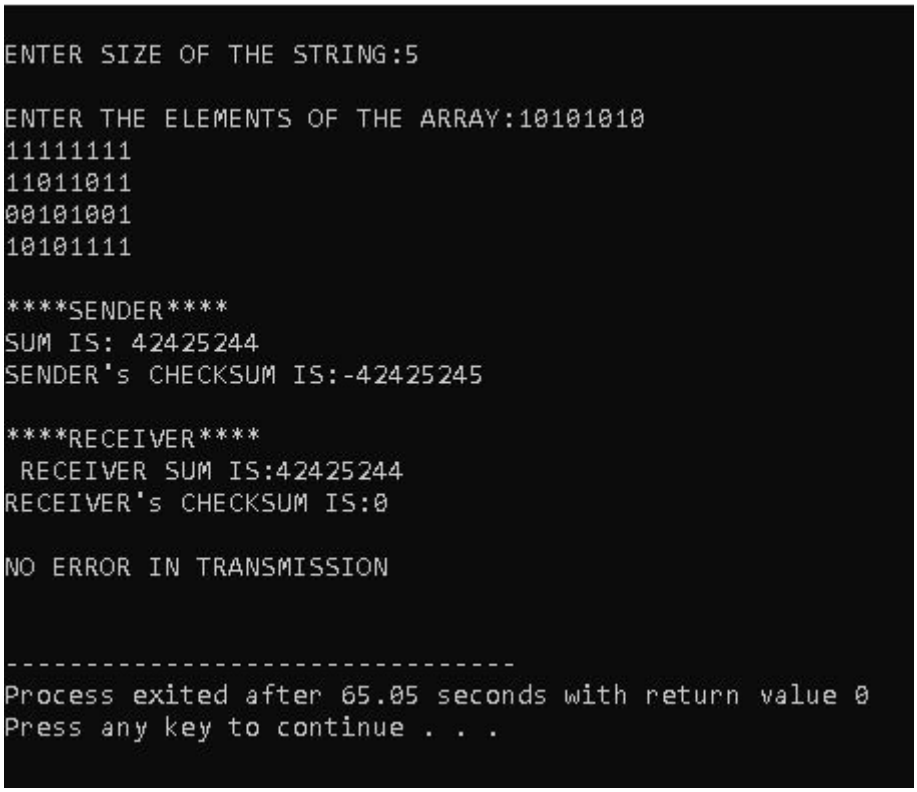
2.C program to check checksum

Code:

```
#include<stdio.h>
#include<math.h>

 int sender(int b[10],int k)
 {
        int checksum,sum=0,i;
        printf("\n****SENDER****\n");

for(i=0;i<k;i++)
                sum+=b[i];
                printf("SUM IS: %d",sum);

        checksum=~sum;
        printf("\nSENDER's CHECKSUM IS:%d",checksum);
        return checksum;
```

```
}

int receiver(int c[10],int k,int scheck)
{
int checksum,sum=0,i;
        printf("\n\n****RECEIVER****\n");
        for(i=0;i<k;i++)
                sum+=c[i];
        printf(" RECEIVER SUM IS:%d",sum);
        sum=sum+scheck;
        checksum=~sum;
        printf("\nRECEIVER's CHECKSUM IS:%d",checksum);
                return checksum;
  }
int main(void)
   {
        int a[10],i,m,scheck,rcheck;
        printf("\nENTER SIZE OF THE STRING:");
        scanf("%d",&m);
        printf("\nENTER THE ELEMENTS OF THE ARRAY:");
        for(i=0;i<m;i++)
        scanf("%d",&a[i]);
        scheck=sender(a,m);
        rcheck=receiver(a,m,scheck);
        if(rcheck==0)
                printf("\n\nNO ERROR IN TRANSMISSION\n\n");
        else
                printf("\n\nERROR DETECTED");
return 0;
}
```

Output:



3.C program to check crc

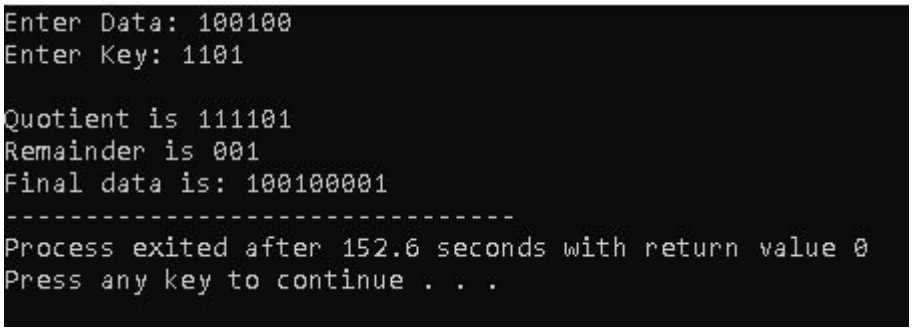
Code:

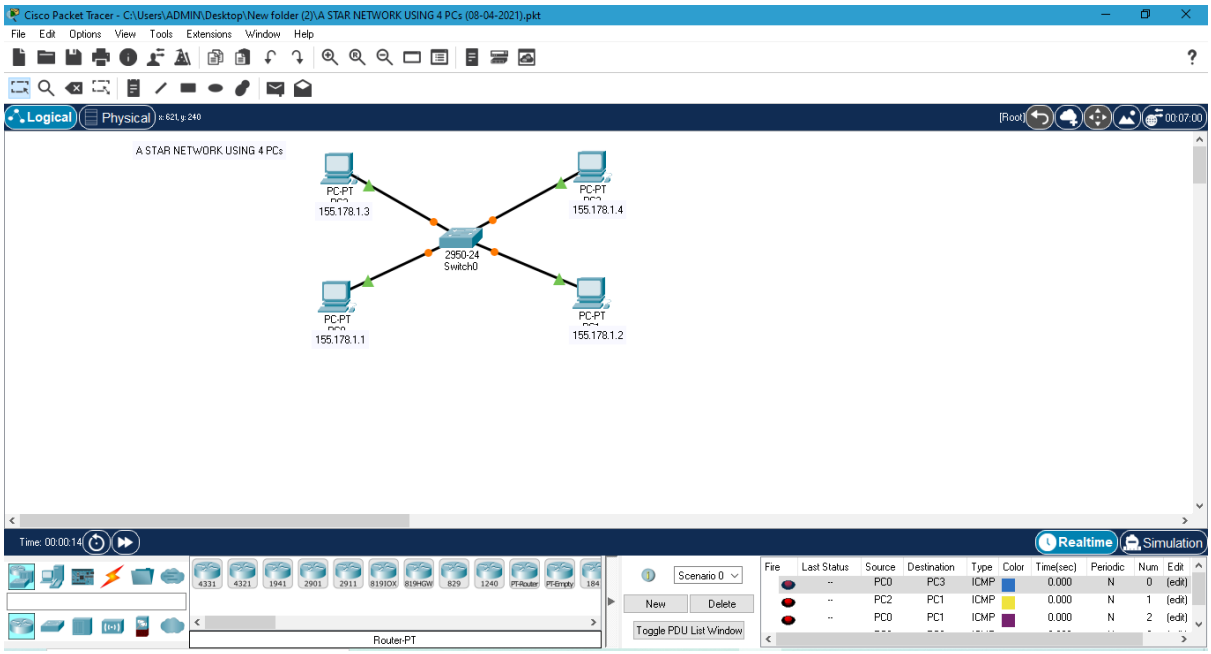
```
#include <stdio.h>
#include <string.h>
int main(void)
 {
        int i,j,keylen,msglen;
        char input[100],
key[30],temp[30],quot[100],rem[30],key1[30];
        printf("Enter Data: ");
        gets(input);
        printf("Enter Key: ");
        gets(key);
        keylen=strlen(key);
        msglen=strlen(input);
```

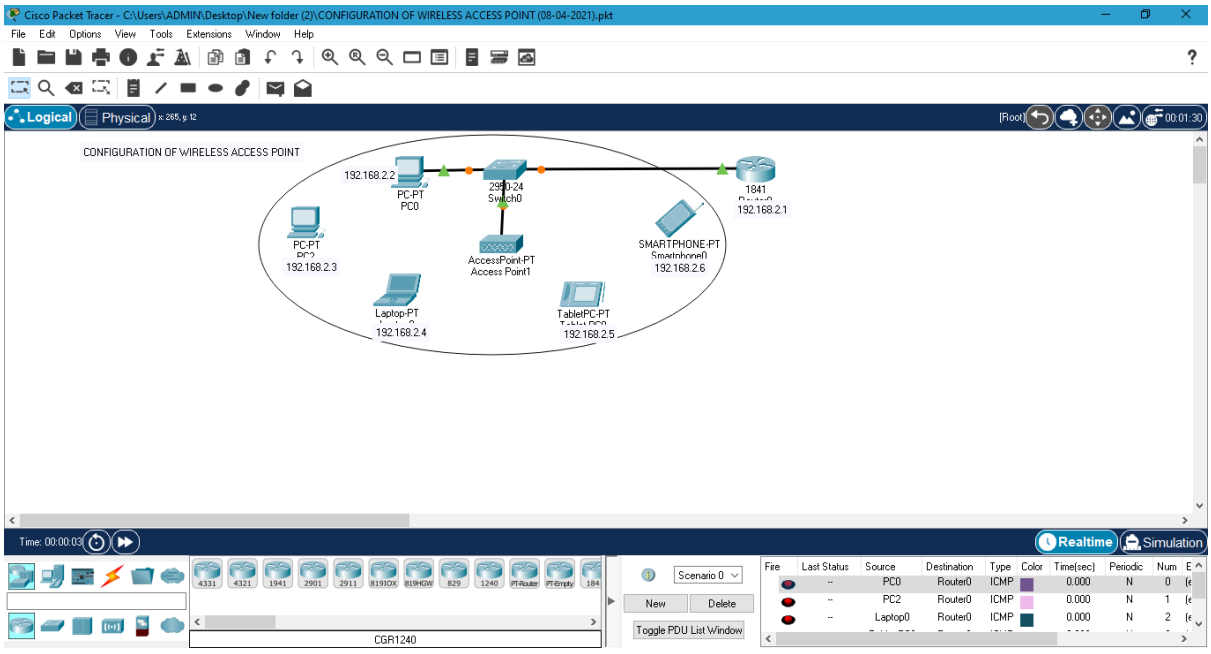
```
strcpy(key1,key);
for (i=0;i<keylen-1;i++) {
        input[msglen+i]='0';
}
for (i=0;i<keylen;i++)
 temp[i]=input[i];
for (i=0;i<msglen;i++) {
        quot[i]=temp[0];
        if(quot[i]=='0')
         for (j=0;j<keylen;j++)
         key[j]='0'; else
         for (j=0;j<keylen;j++)
         key[j]=key1[j];
        for (j=keylen-1;j>0;j--) {
                if(temp[j]==key[j])
                 rem[j-1]='0'; else
                 rem[j-1]='1';
        }
        rem[keylen-1]=input[i+keylen];
        strcpy(temp,rem);
}
strcpy(rem,temp);
printf("\nQuotient is ");
for (i=0;i<msglen;i++)
 printf("%c",quot[i]);
printf("\nRemainder is ");
for (i=0;i<keylen-1;i++)
 printf("%c",rem[i]);
printf("\nFinal data is: ");
for (i=0;i<msglen;i++)
```

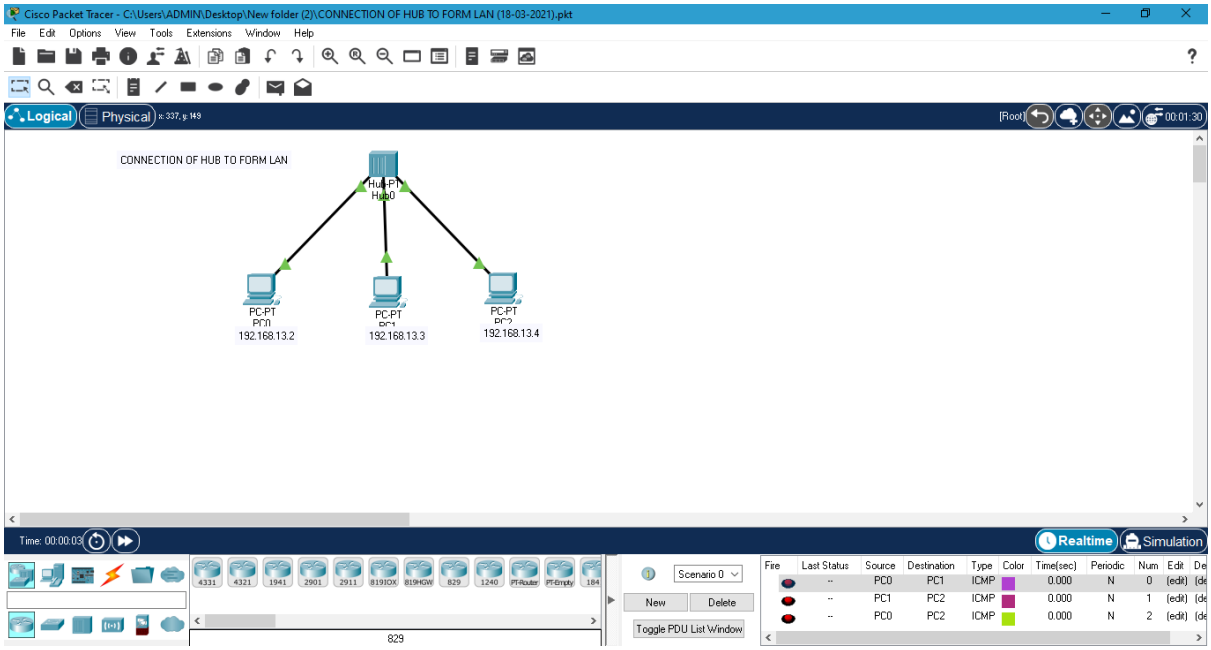
```
        printf("%c",input[i]);
       for (i=0;i<keylen-1;i++)
        printf("%c",rem[i]);
return 0;
}
```

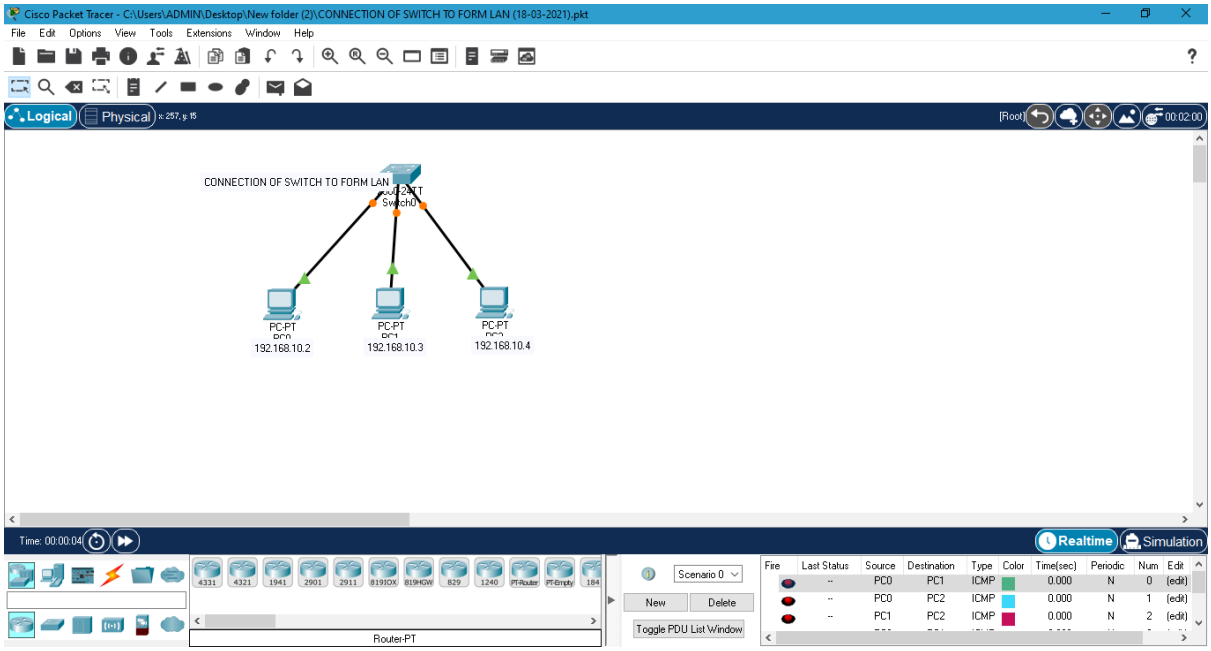
Output:

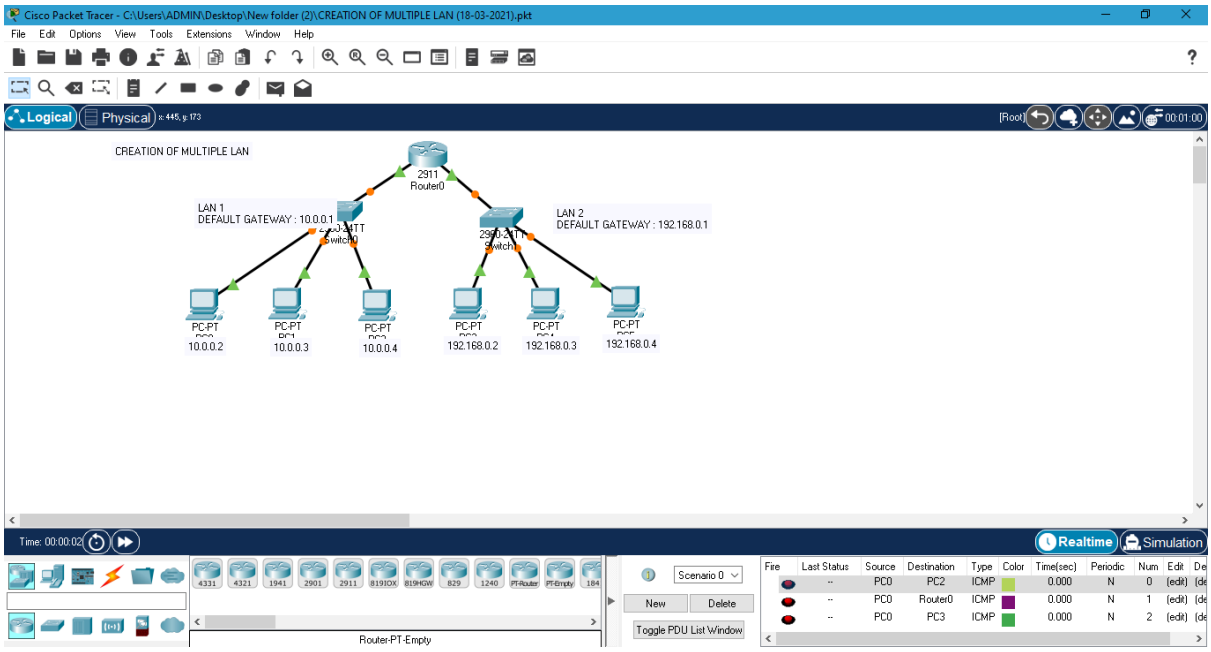


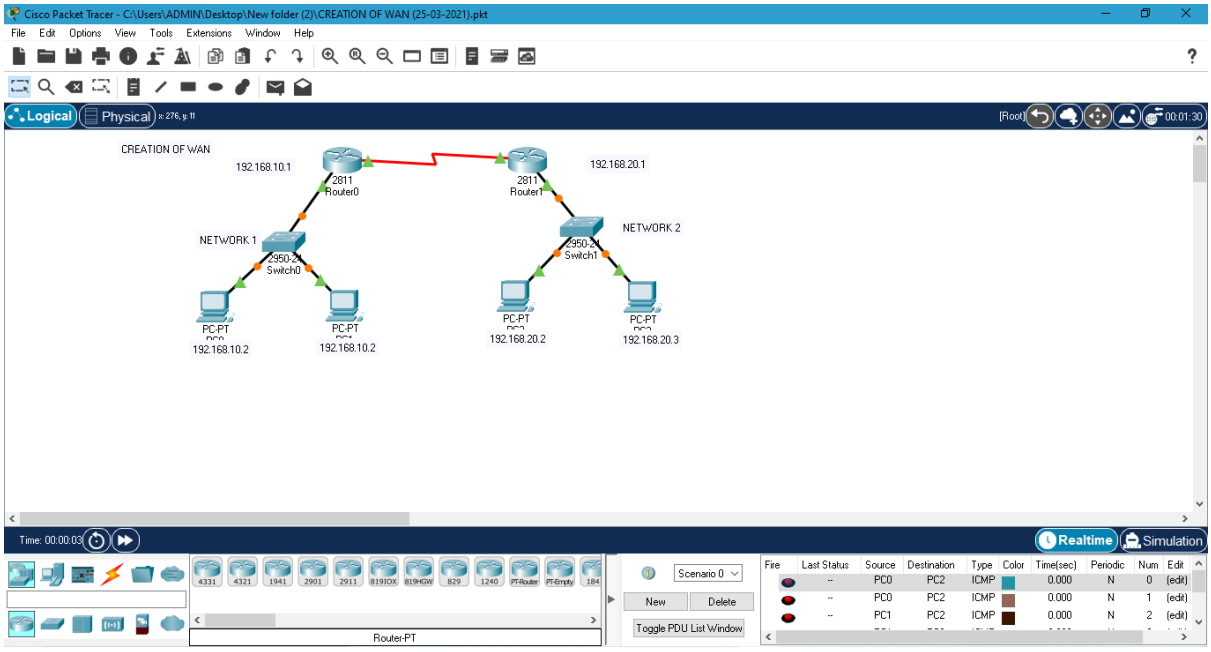

Cisco Packet Tracer - C:\Users\ADMIN\Desktop\New folder (2)\A STAR NETWORK USING 4 PCs (08-04-2021).pkt
File Edit Options View Tools Extensions Window Help
Logical
Physical
A STAR NETWORK USING 4 PCs
PC-PT
155.178.1.3
PC-PT
155.178.1.4
2950-24
Switch0
PC-PT
155.178.1.1
PC-PT
155.178.1.2
Realtime
Simulation
Router-PT
Scenario 0
New
Delete
Toggle PDU List Window

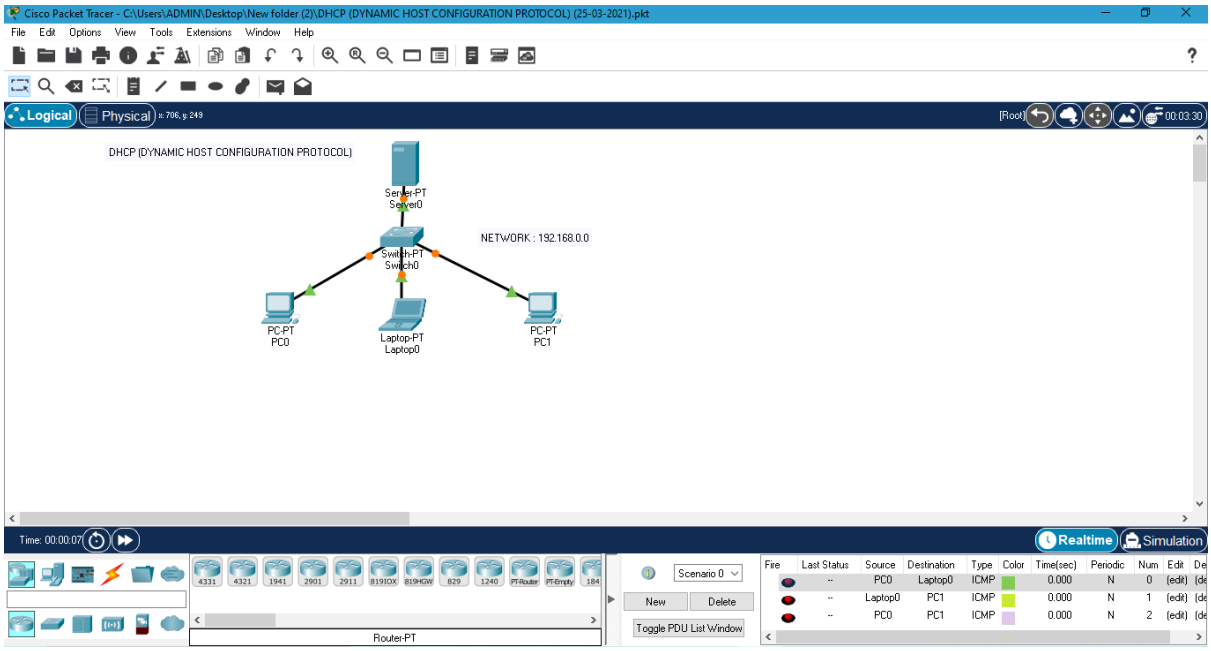

Cisco Packet Tracer - C:\Users\ADMIN\Desktop\New folder (2)\CONFIGURATION OF WIRELESS ACCESS POINT (08-04-2021).pkt
File Edit Options View Tools Extensions Window Help
Logical
Physical
CONFIGURATION OF WIRELESS ACCESS POINT
192.168.2.2
PC-PT
PC0
2950-24
Switch0
1841
192.168.2.1
PC-PT
192.168.2.3
AccessPoint-PT
Access Point1
SMARTPHONE-PT
192.168.2.6
Laptop-PT
192.168.2.4
TabletPC-PT
192.168.2.5
Realtime
Simulation
CGR1240
Scenario 0
New
Delete
Toggle PDU List Window

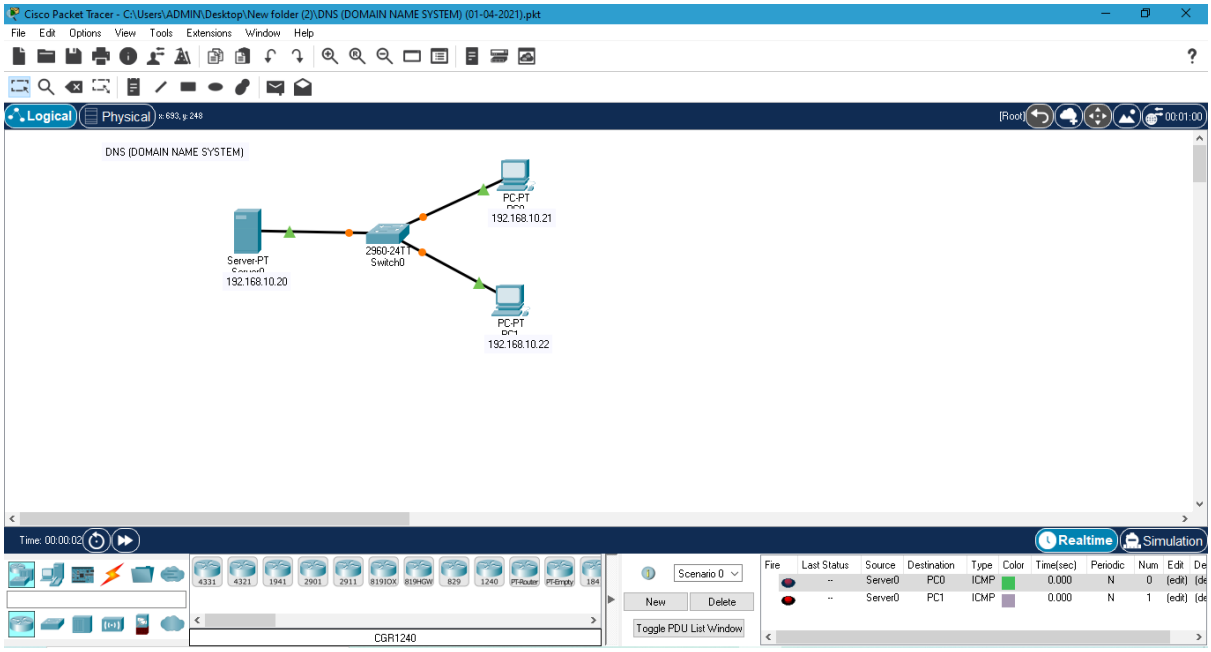

Cisco Packet Tracer - C:\Users\ADMIN\Desktop\New folder (2)\CONNECTION OF HUB TO FORM LAN (18-03-2021).pkt
File Edit Options View Tools Extensions Window Help
Logical
Physical
[Root]
CONNECTION OF HUB TO FORM LAN
Hub-PT
Hub0
PC-PT
PC0
192.168.13.2
PC-PT
192.168.13.3
PC-PT
192.168.13.4
Time: 00:00:03
Realtime
Simulation
829
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
PC0
PC1
ICMP
0.000
N
0
(edit)
PC1
PC2
ICMP
0.000
N
1
(edit)
PC0
PC2
ICMP
0.000
N
2
(edit)

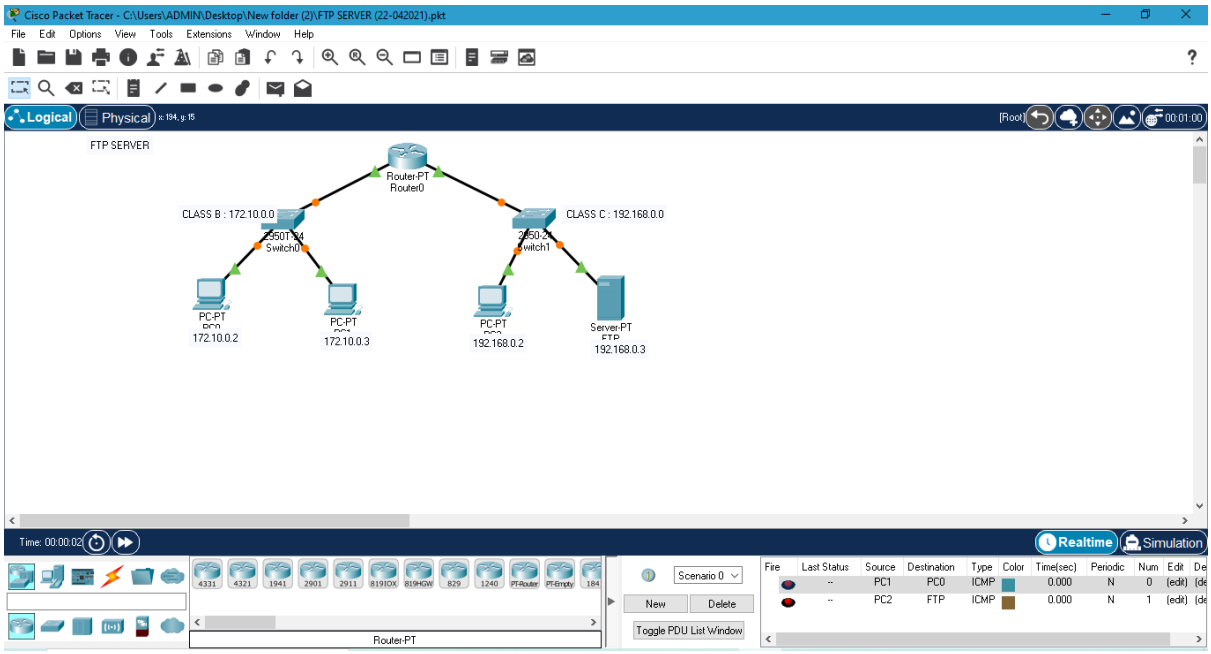

Cisco Packet Tracer - C:\Users\ADMIN\Desktop\New folder (2)\CONNECTION OF SWITCH TO FORM LAN (18-03-2021).pkt
File Edit Options View Tools Extensions Window Help
Logical
Physical
[Root]
CONNECTION OF SWITCH TO FORM LAN
Switch0
PC-PT
192.168.10.2
PC-PT
192.168.10.3
PC-PT
192.168.10.4
Time: 00:00:04
Realtime
Simulation
Router-PT
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
PC0
PC1
ICMP
0.000
N
0
(edit)
PC0
PC2
ICMP
0.000
N
1
(edit)
PC1
PC2
ICMP
0.000
N
2
(edit)

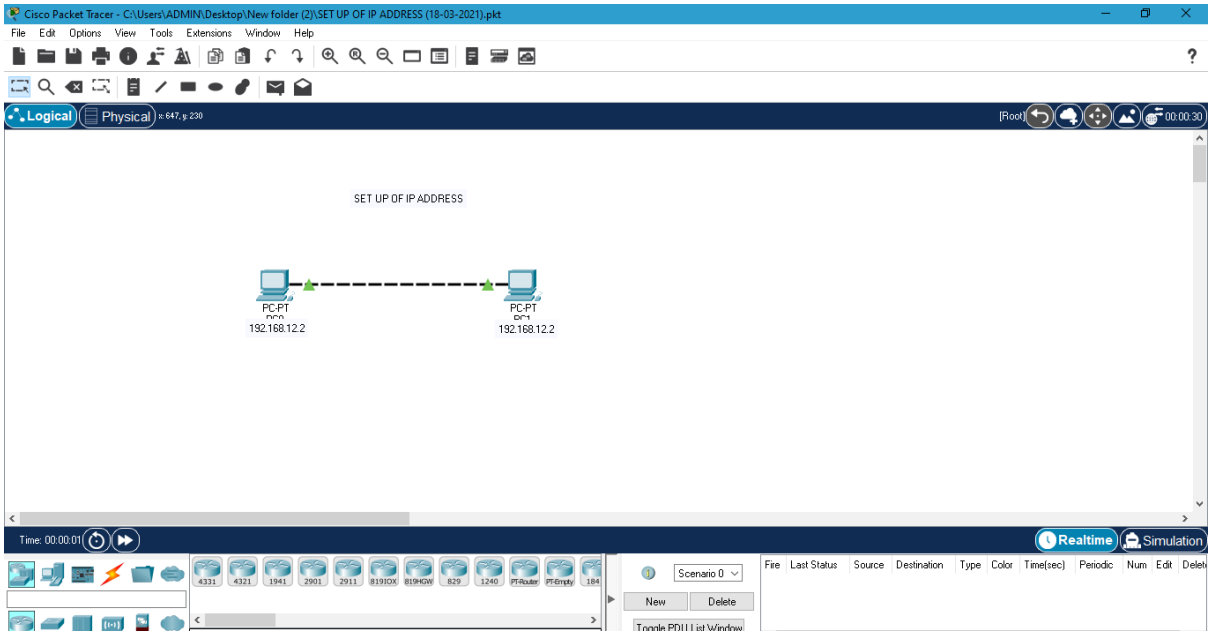

Cisco Packet Tracer - C:\Users\ADMIN\Desktop\New folder (2)\CREATION OF MULTIPLE LAN (18-03-2021).pkt
File Edit Options View Tools Extensions Window Help
Logical
Physical
CREATION OF MULTIPLE LAN
2911
Router0
LAN 1
DEFAULT GATEWAY : 10.0.0.1
LAN 2
DEFAULT GATEWAY : 192.168.0.1
Switch0
Switch1
PC-PT
10.0.0.2
10.0.0.3
10.0.0.4
192.168.0.2
192.168.0.3
192.168.0.4
Time: 00:00:02
Realtime
Simulation
Router-PT-Empty
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
PC0
PC2
ICMP
0.000
N
(edit)
Router0
PC3

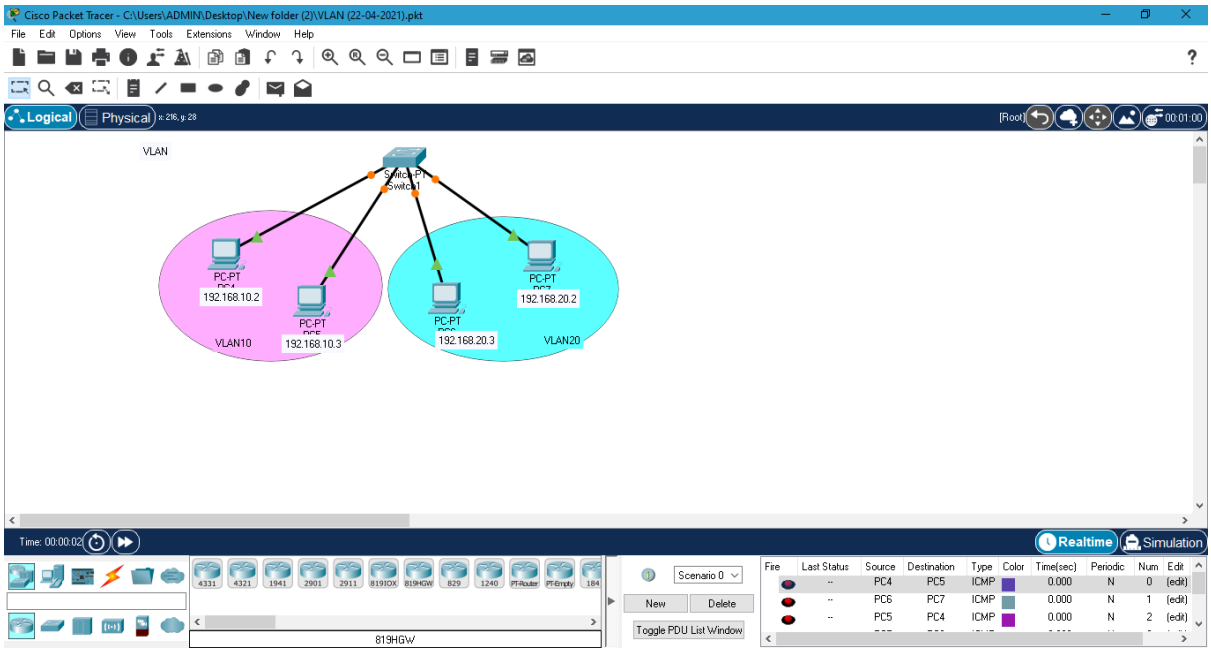

Cisco Packet Tracer - C:\Users\ADMIN\Desktop\New folder (2)\CREATION OF WAN (25-03-2021).pkt
File Edit Options View Tools Extensions Window Help
Logical
Physical
CREATION OF WAN
192.168.10.1
192.168.20.1
2811
Router0
Router1
NETWORK 1
NETWORK 2
2950-24
Switch0
Switch1
PC-PT
192.168.10.2
192.168.20.2
192.168.20.3
Time: 00:00:03
Realtime
Simulation
Router-PT
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
PC0
PC2
ICMP
0.000
N
(edit)
PC1

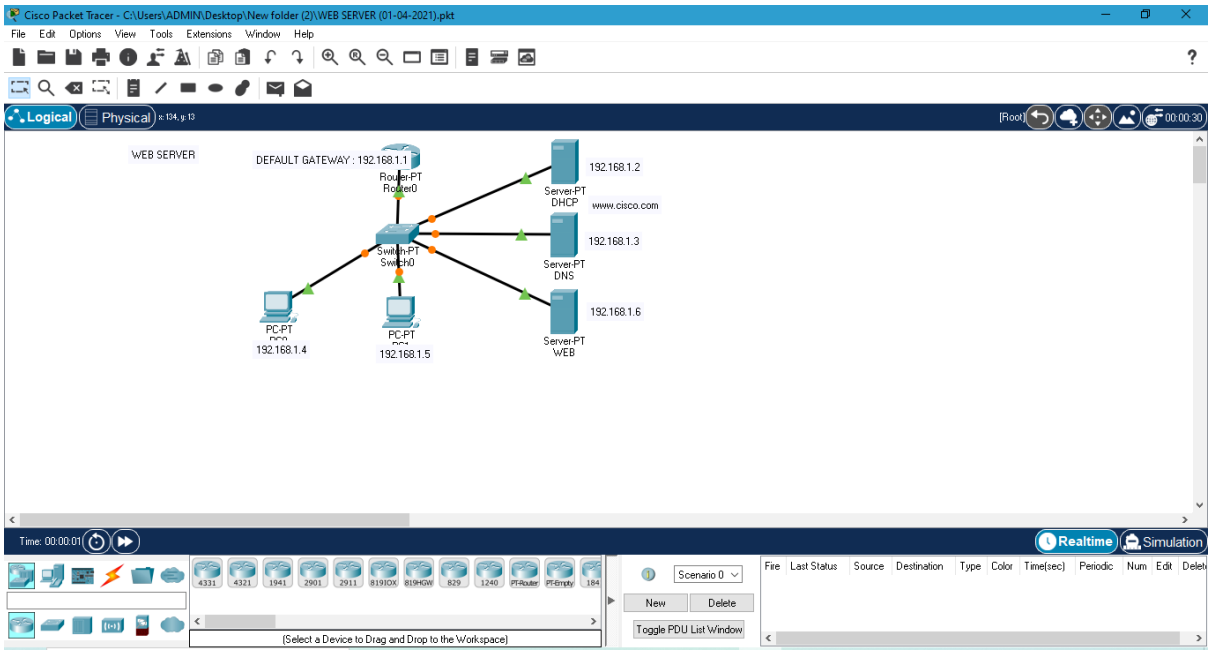

Cisco Packet Tracer - C:\Users\ADMIN\Desktop\New folder (2)\DHCP (DYNAMIC HOST CONFIGURATION PROTOCOL) (25-03-2021).pkt
File Edit Options View Tools Extensions Window Help
Logical
Physical
DHCP (DYNAMIC HOST CONFIGURATION PROTOCOL)
Server-PT Server0
Switch-PT Switch0
NETWORK : 192.168.0.0
PC-PT PC0
Laptop-PT Laptop0
PC-PT PC1
Time: 00:00:07
Realtime
Simulation
Router-PT
Scenario 0
New
Delete
Toggle PDU List Window
Fire Last Status Source Destination Type Color Time(sec) Periodic Num Edit
PC0 Laptop0 ICMP 0.000 N 0 (edit)
Laptop0 PC1 ICMP 0.000 N 1 (edit)
PC0 PC1 ICMP 0.000 N 2 (edit)


Cisco Packet Tracer - C:\Users\ADMIN\Desktop\New folder (2)\DNS (DOMAIN NAME SYSTEM) (01-04-2021).pkt
File Edit Options View Tools Extensions Window Help
Logical
Physical
DNS (DOMAIN NAME SYSTEM)
PC-PT
192.168.10.21
Server-PT
192.168.10.20
2960-24TT Switch0
PC-PT
192.168.10.22
Time: 00:00:02
Realtime
Simulation
CGR1240
Scenario 0
New
Delete
Toggle PDU List Window
Fire Last Status Source Destination Type Color Time(sec) Periodic Num Edit
Server0 PC0 ICMP 0.000 N 0 (edit)
Server0 PC1 ICMP 0.000 N 1 (edit)


Cisco Packet Tracer - C:\Users\ADMIN\Desktop\New folder (2)\FTP SERVER (22-042021).pkt
File Edit Options View Tools Extensions Window Help
Logical
Physical
[Root]
FTP SERVER
Router-PT
Router0
CLASS B : 172.10.0.0
CLASS C : 192.168.0.0
2950T-24
Switch0
2950-24
Switch1
PC-PT
172.10.0.2
PC-PT
172.10.0.3
PC-PT
192.168.0.2
Server-PT
FTP
192.168.0.3
Time: 00:00:02
Realtime
Simulation
Router-PT
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
PC1
PC0
ICMP
0.000
N
0
(edit)
PC2
FTP
ICMP
0.000
N
1
(edit)


Cisco Packet Tracer - C:\Users\ADMIN\Desktop\New folder (2)\SET UP OF IP ADDRESS (18-03-2021).pkt
File Edit Options View Tools Extensions Window Help
Logical
Physical
[Root]
SET UP OF IP ADDRESS
PC-PT
192.168.12.2
PC-PT
192.168.12.2
Time: 00:00:01
Realtime
Simulation
Scenario 0
New
Delete
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit


Cisco Packet Tracer - C:\Users\ADMIN\Desktop\New folder (2)\VLAN (22-04-2021).pkt
File Edit Options View Tools Extensions Window Help
Logical
Physical
VLAN
Switch-PT
Switch1
PC-PT
192.168.10.2
PC-PT
192.168.10.3
VLAN10
PC-PT
192.168.20.2
PC-PT
192.168.20.3
VLAN20
Time: 00:00:02
Realtime
Simulation
819HGW
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
PC4
PC5
ICMP
0.000
N
0
(edit)
PC6
PC7
ICMP
0.000
N
1
(edit)
PC5
PC4
ICMP
0.000
N
2
(edit)


Cisco Packet Tracer - C:\Users\ADMIN\Desktop\New folder (2)\WEB SERVER (01-04-2021).pkt
File Edit Options View Tools Extensions Window Help
Logical
Physical
WEB SERVER
DEFAULT GATEWAY : 192.168.1.1
Router-PT
Router0
Switch-PT
Switch0
192.168.1.2
Server-PT
DHCP
www.cisco.com
192.168.1.3
Server-PT
DNS
192.168.1.6
Server-PT
WEB
PC-PT
192.168.1.4
PC-PT
192.168.1.5
Time: 00:00:01
Realtime
Simulation
(Select a Device to Drag and Drop to the Workspace)
Scenario 0
New
Delete
Toggle PDU List Window