VISVESVARAYA TECHNOLOGICAL UNIVERSITY

"JnanaSangama", Belgaum -590014, Karnataka.

LAB RECORD

Computer Network Lab (23CS5PCCON)

Submitted by

Shreya Soni(1BM22CS268)

in partial fulfilment for the award of the degree of

BACHELOR OF ENGINEERING

in

COMPUTER SCIENCE AND ENGINEERING

B.M.S. COLLEGE OF ENGINEERING

(Autonomous Institution under VTU)

BENGALURU-560019

Academic Year 2024-25 (odd)

B.M.S. College of Engineering

Bull Temple Road, Bangalore 560019

(Affiliated To Visvesvaraya Technological University, Belgaum)

Department of Computer Science and Engineering

CERTIFICATE

This is to certify that the Lab work entitled "Computer Network (23CS5PCCON)" carried out by **Shreya Soni (1BM22CS268),** who is Bonafide student of **B.M.S. College of Engineering.** It is in partial fulfilment for the award of **Bachelor of Engineering in Computer Science and Engineering** of the Visvesvaraya Technological University, Belgaum. The Lab report has been approved as it satisfies the academic requirements of the above-mentioned subject and the work prescribed for the said degree.

Megha J Assistant Professor Department of CSE, BMSCE	Dr. Kavitha Sooda Professor & HOD Department of CSE, BMSCE

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Github Link:
https://github.com/SHREYASONI28/CNLAB_1BM22CS268

Index-Cycle-II

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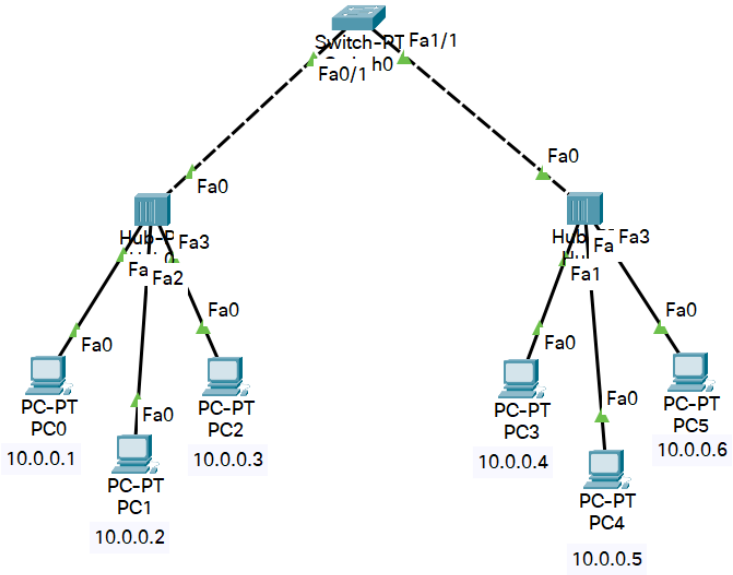
Cycle-I

Program 1

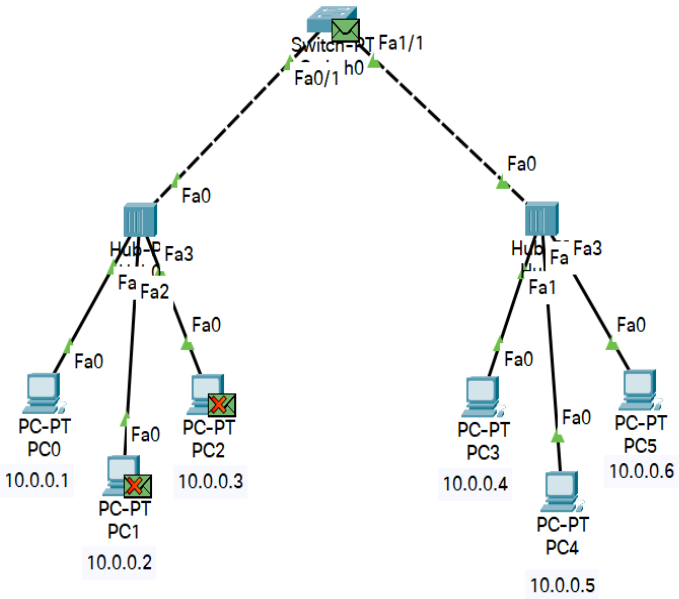
i. Create a topology involving multiple hubs and a switch connecting them to simulate with simple PDU.

ii. Procedure along with the topology

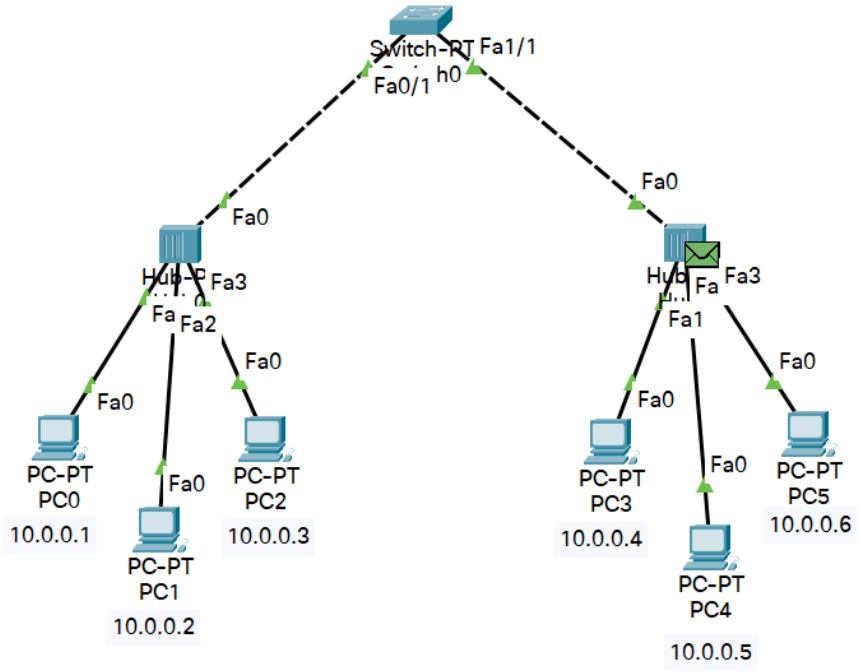


iii. Screen shots/ output

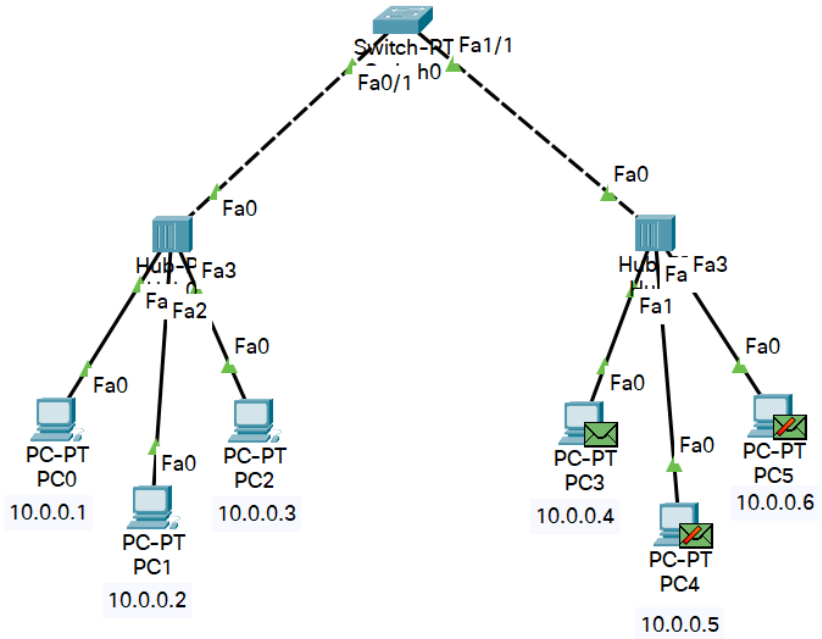
Hub behaviour at sending end



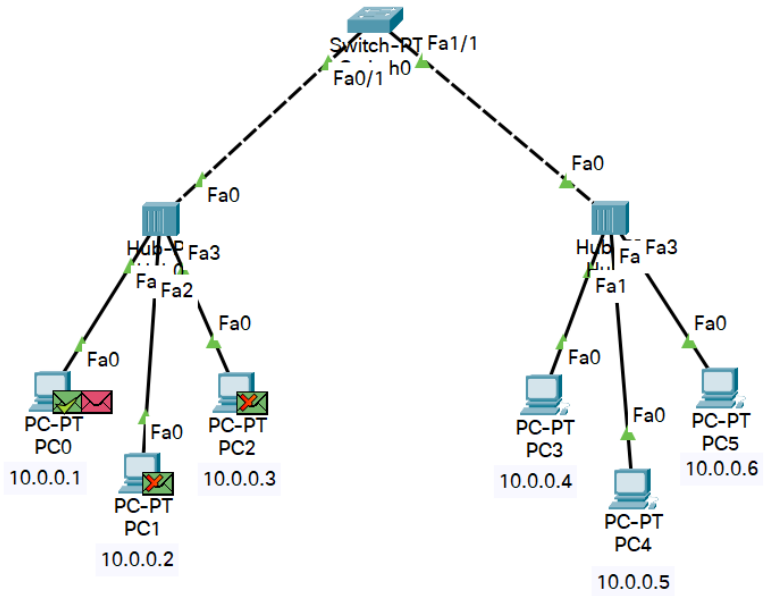
Switch behaviour



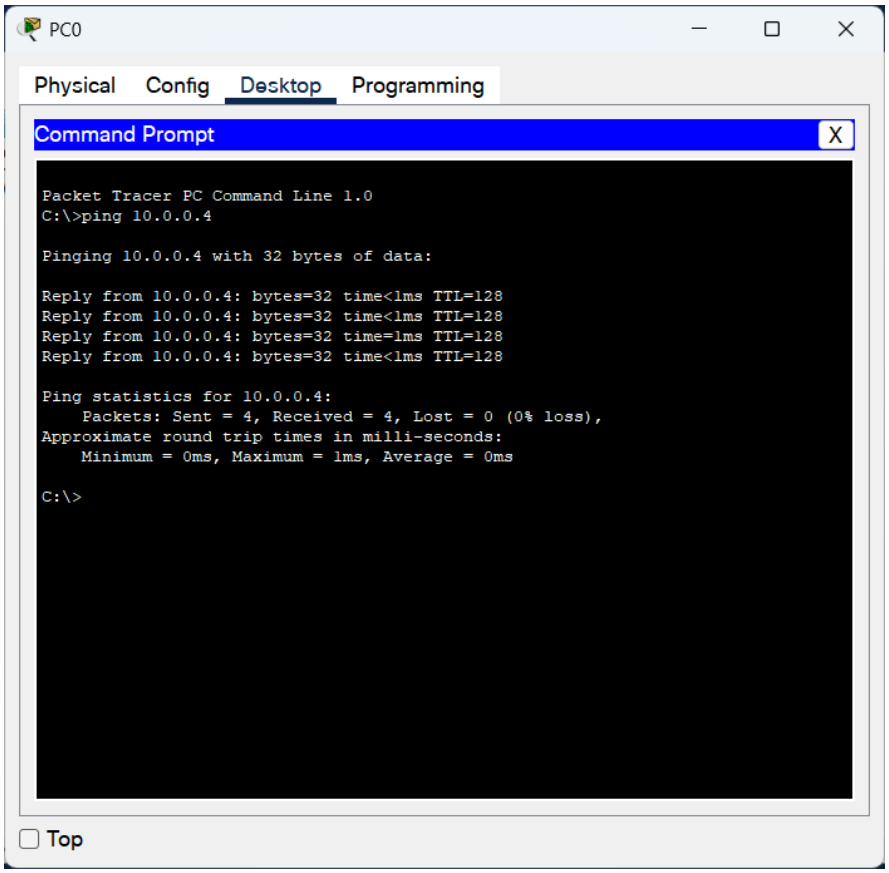
Hub behaviour at receiving end



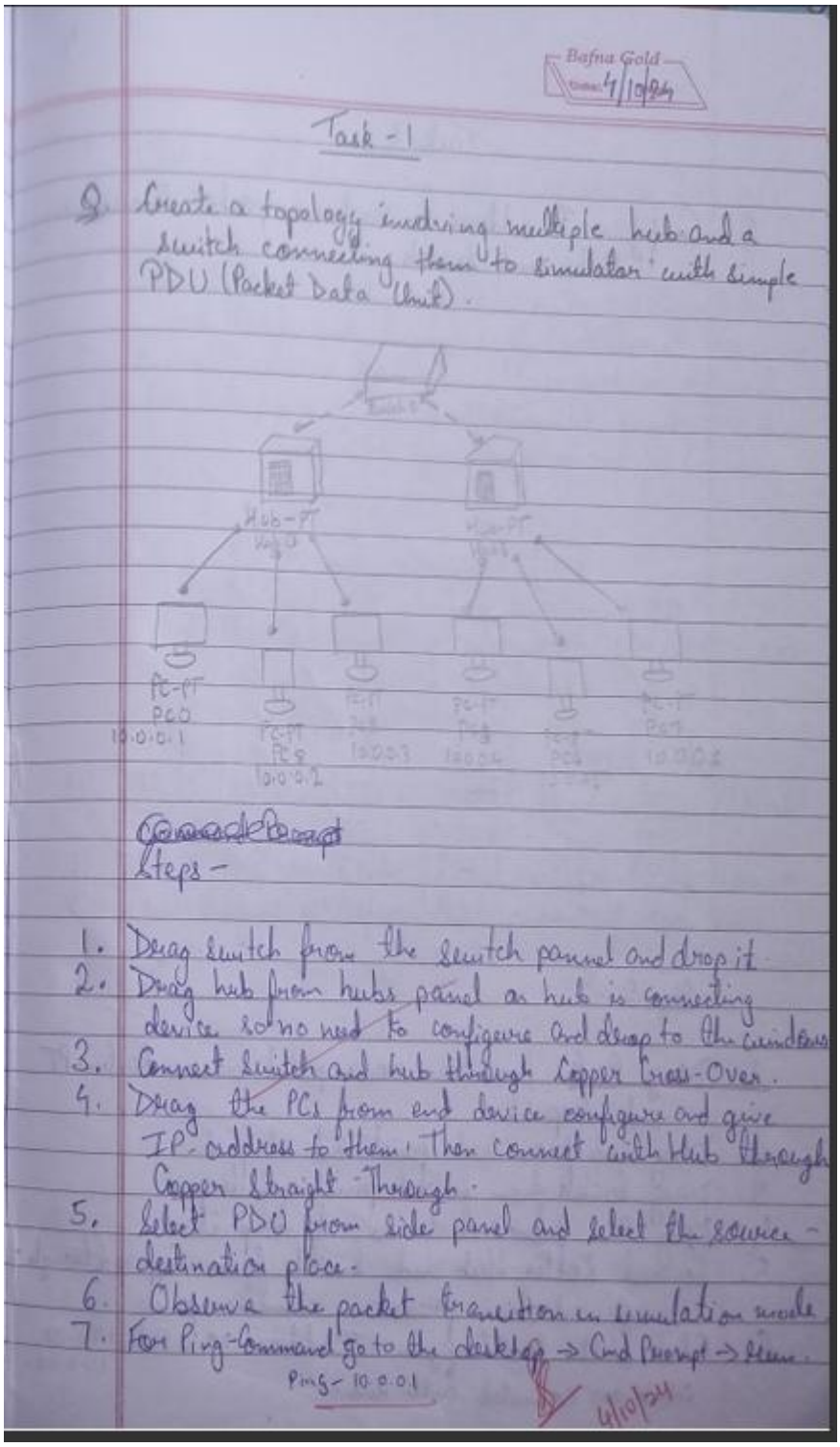
Hub behaviour when back to sender



Ping command to connectivity



iv. Observation



Bafna Gold

Date: 4/10/24

Task - 1

Q. Create a topology involving multiple hub and a switch connecting them to simulator with simple PDU (Packet Data Unit).

Hub-PT Hub0

Hub-PT Hub1

PC-PT PC0 10.0.0.1

PC-PT PC1 10.0.0.2

PC-PT PC2 10.0.0.3

PC-PT PC3 10.0.0.4

PC-PT PC4

PC-PT PC5 10.0.0.6

~~Command Prompt~~

Steps -

1. Drag switch from the switch panel and drop it.
2. Drag hub from hubs panel as hub is connecting device so no need to configure and drop to the windows
3. Connect switch and hub through Copper Cross-Over.
4. Drag the PCs from end device configure and give IP address to them. Then connect with Hub through Copper Straight Through.
5. Select PDU from side panel and select the source - destination place.
6. Observe the packet transition in simulation mode
7. For Ping-Command go to the desktop → Cmd Prompt → Ping.

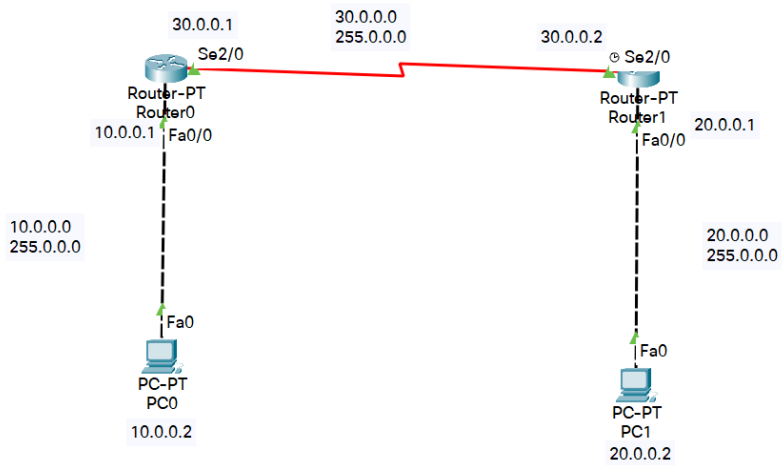
Ping - 10.0.0.1

4/10/24

Program 2

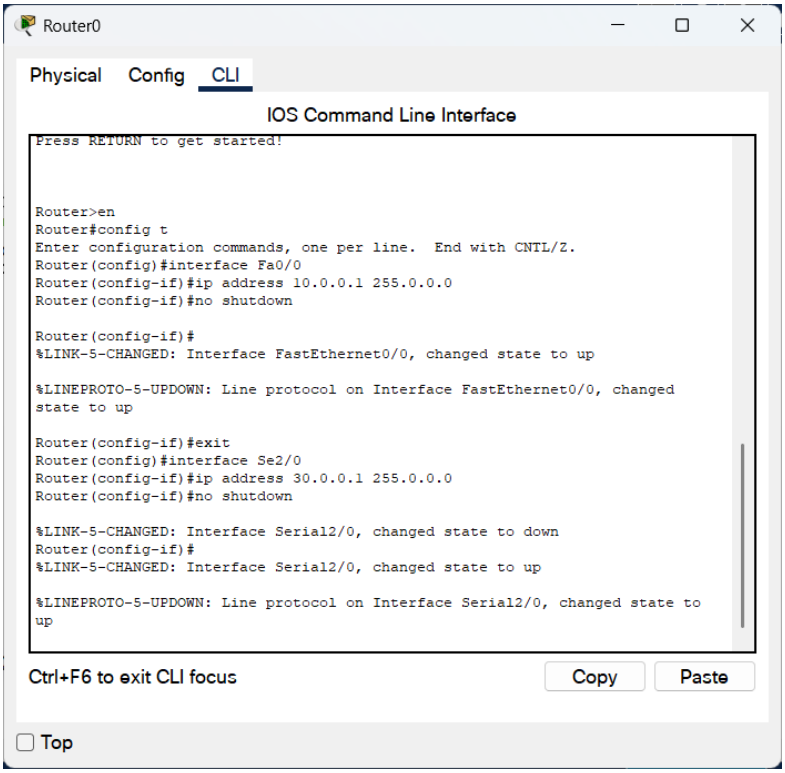
i. Configure IP address to routers in packet tracer.Explore the following messages:ping responses,destination unreachable,request timed out,reply.

ii. Procedure along with the topology

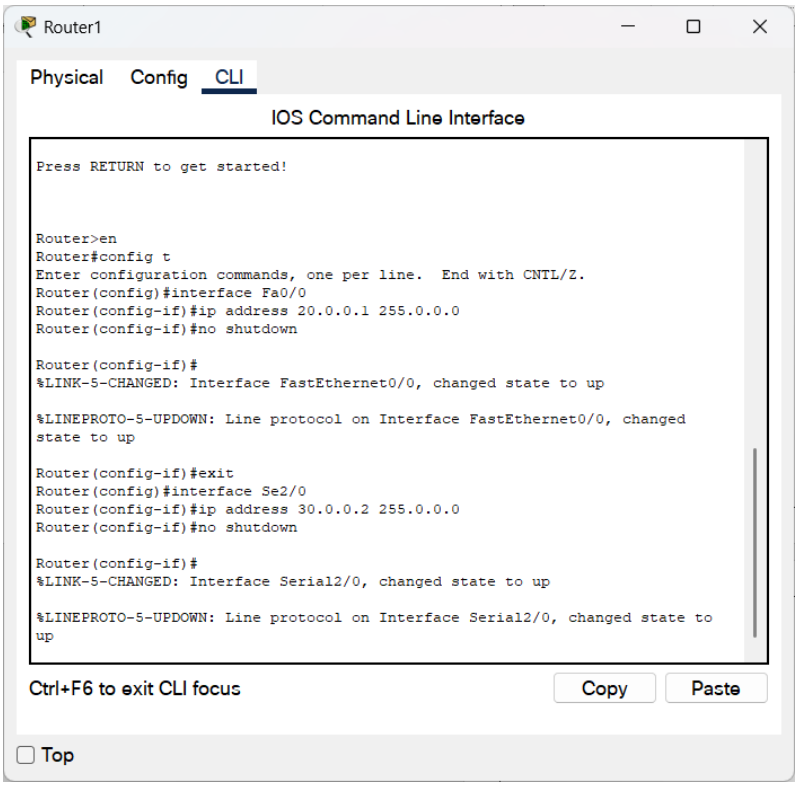


iii. Screen shots/ output

Router0 configuration



Router1 configuration



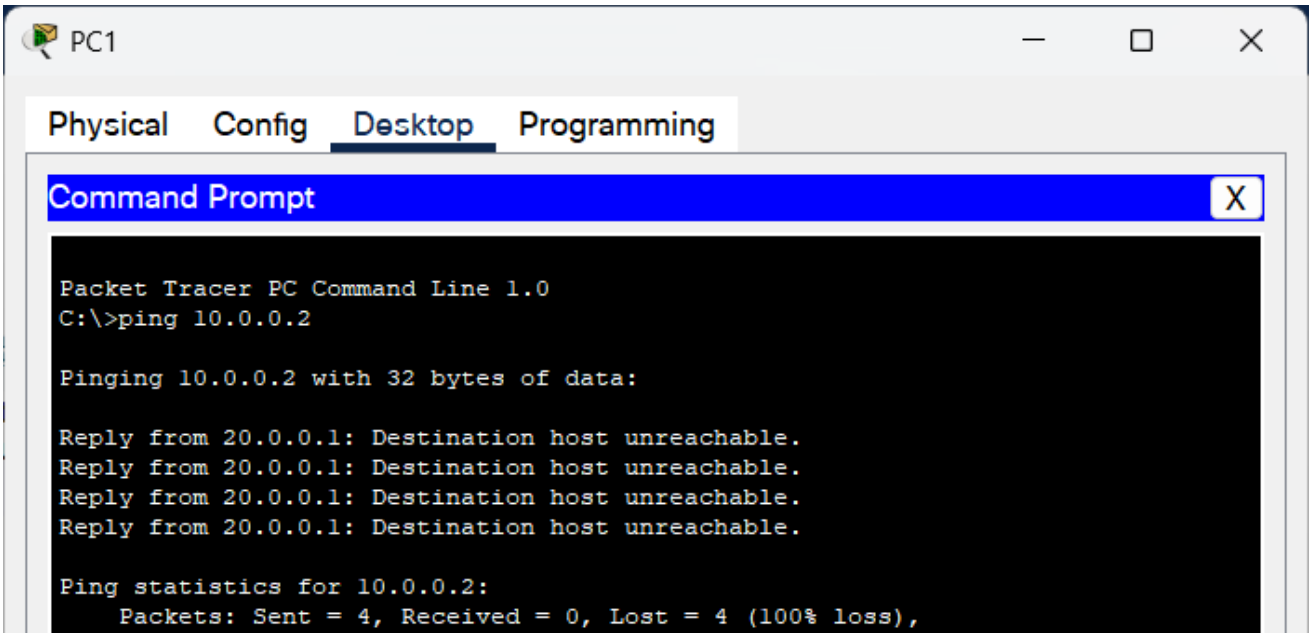
Ip route command in Router0

```
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#ip route 20.0.0.0 255.0.0.0 30.0.0.2
Router(config)#
```

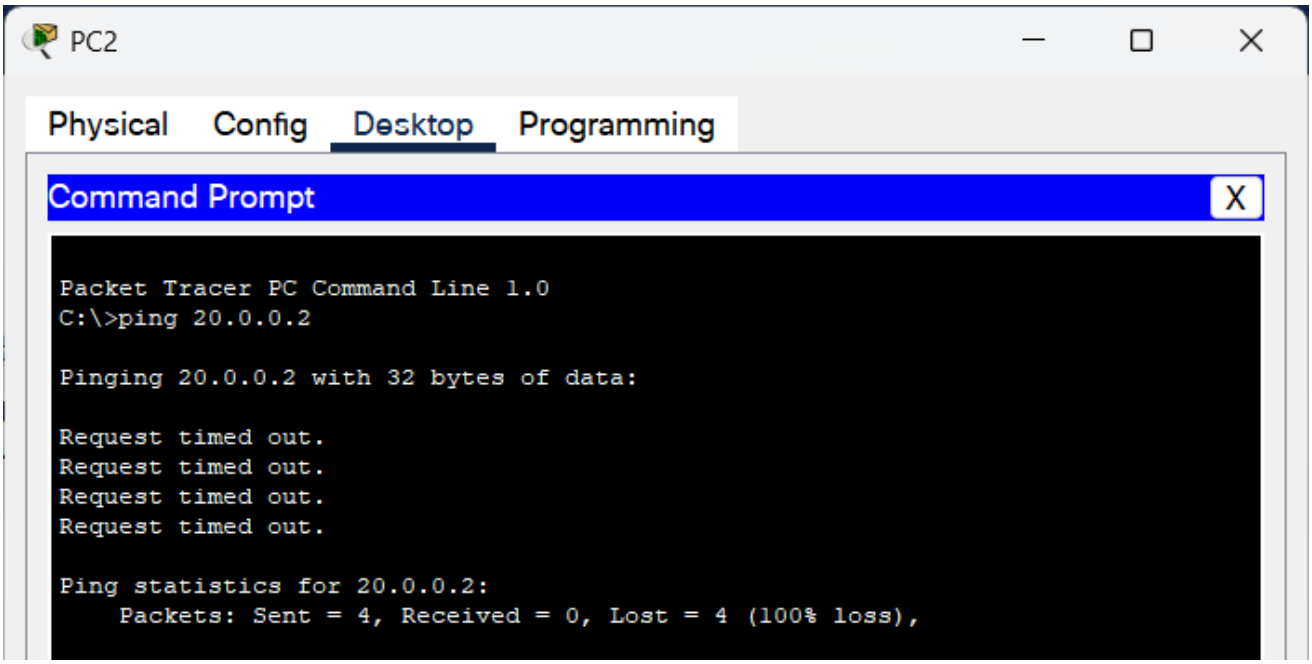
Ip route command in Router1

```
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z
Router(config)#ip route 10.0.0.0 255.0.0.0 30.0.0.1
Router(config)#
```

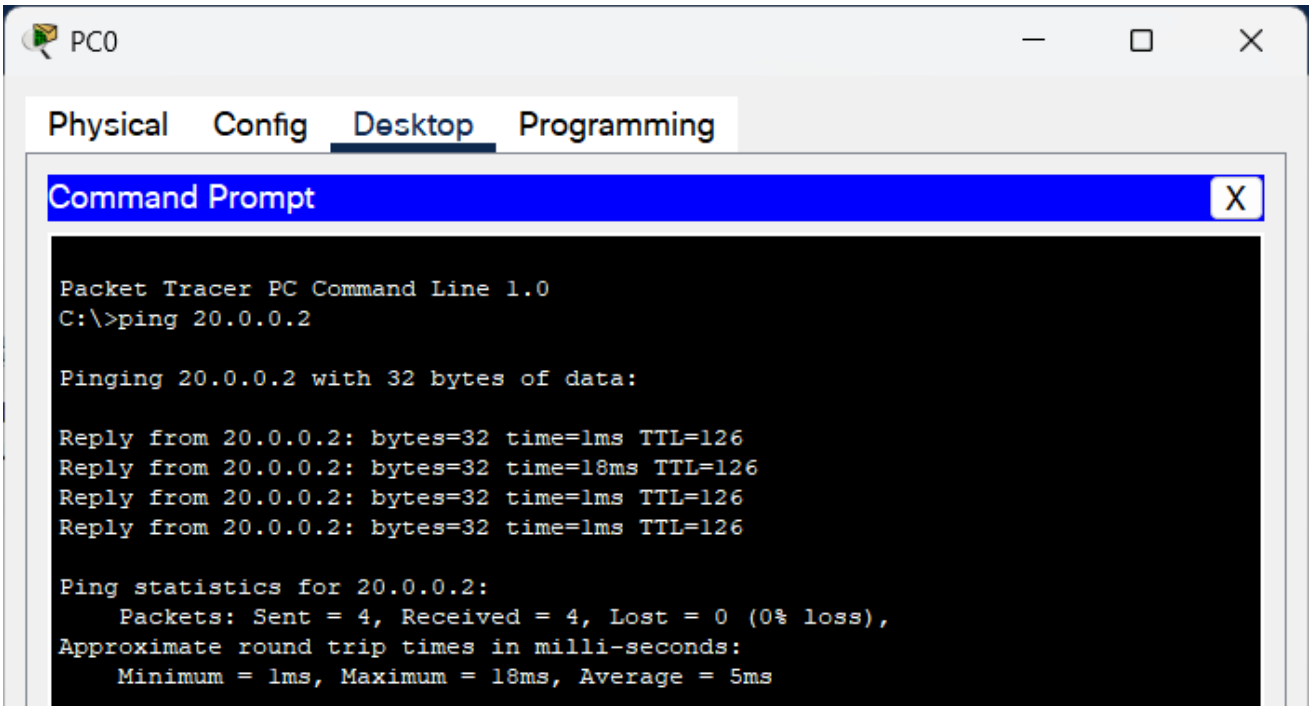
Destination host Unreachable (Before establishing network Fully)



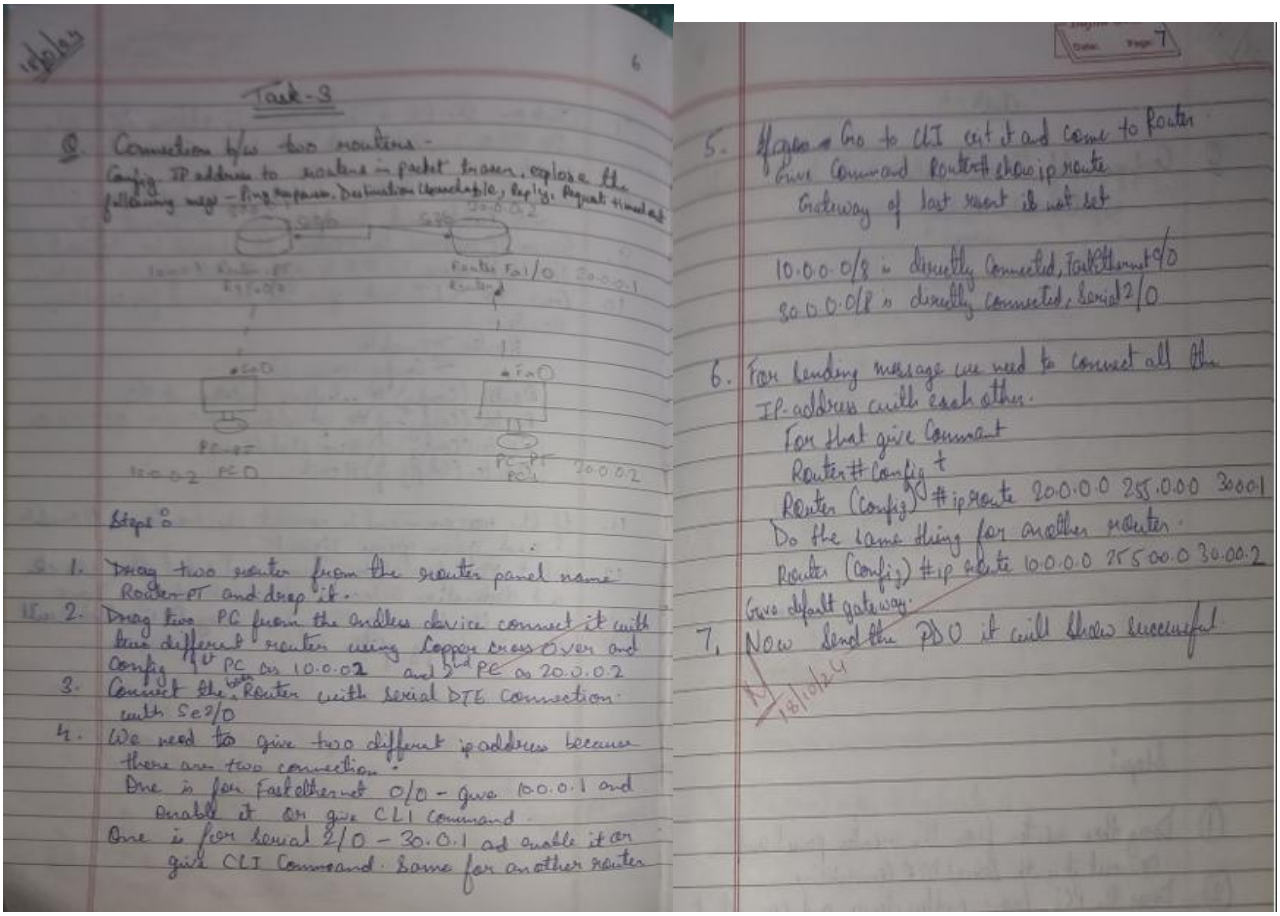
Request Timed Out



Reply from Destination



iv. Observation



Task-3

Q. Connection b/w two routers -
Config IP address to routers in packet tracer, explore the following msg - Ping response, Destination Unreachable, Req'g, Request timed out

Steps :

1. Drag two router from the router panel name Router-PT and drop it.
2. Drag two PC from the end device connect it with two different router using Copper cross over and Config 1st PC as 10.0.0.2 and 2nd PC as 20.0.0.2
3. Connect the router with serial DTE connection with Se2/0
4. We need to give two different ip address because there are two connection.
One is for Fastethernet 0/0 - give 10.0.0.1 and enable it on give CLI command.
One is for Serial 2/0 - 30.0.1 and enable it on give CLI Command. Same for another router

5. Go to CLI cut it and come to Router
Give Command Router# show ip route
Gateway of last resort is not set
10.0.0.0/8 is directly connected, FastEthernet 0/0
30.0.0.0/8 is directly connected, Serial 2/0

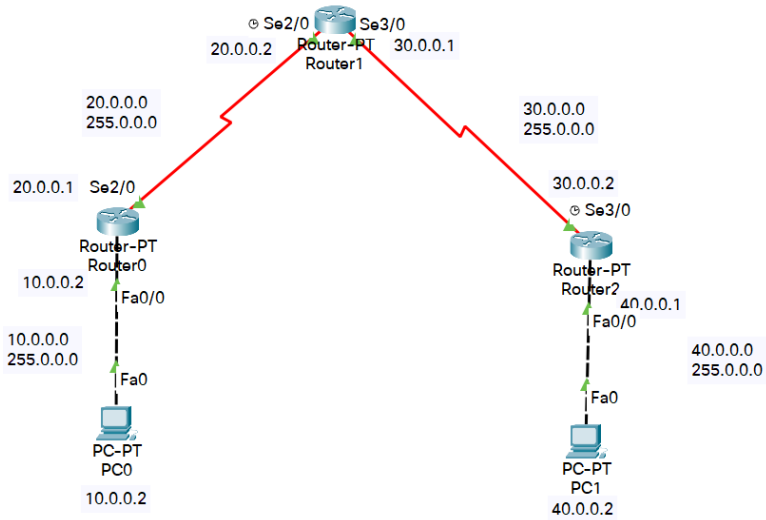
6. For sending message we need to connect all the IP address with each other.
For that give Command
Router# Config t
Router (Config) # ip route 20.0.0.0 255.0.0.0 30.0.0.1
Do the same thing for another router.
Router (Config) # ip route 10.0.0.0 255.0.0.0 30.0.0.2
Give default gateway.
7. Now send the PDU it will show successful

18/10/24

Program 3

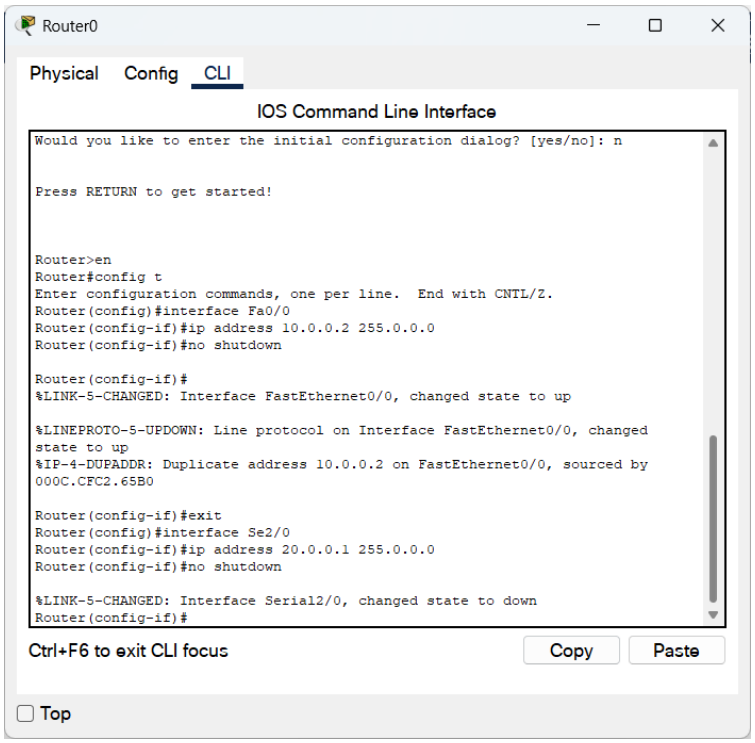
i. Configure default route, static route to the router

ii. Procedure along with the topology

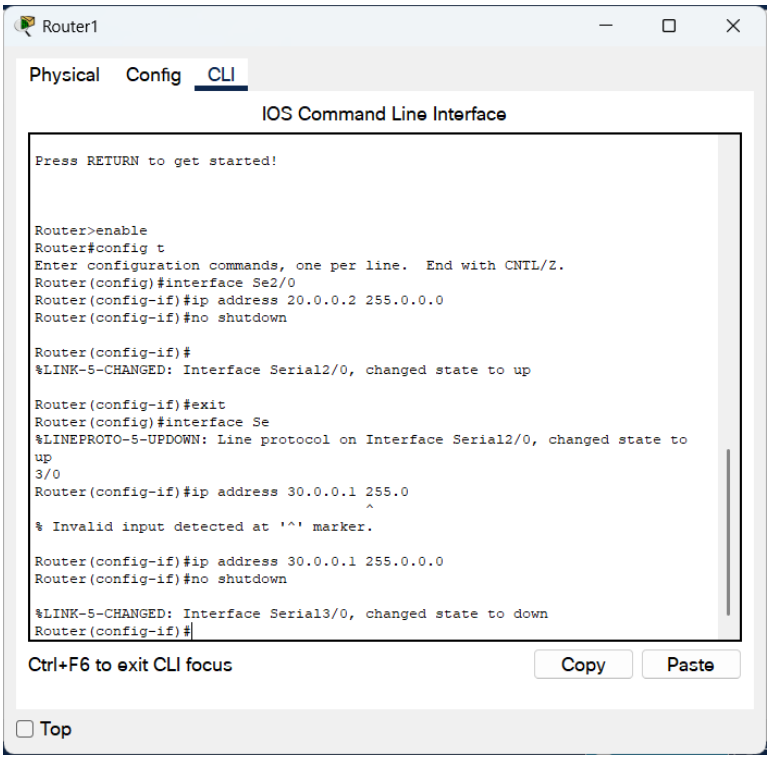


iii. Screen shots/ output

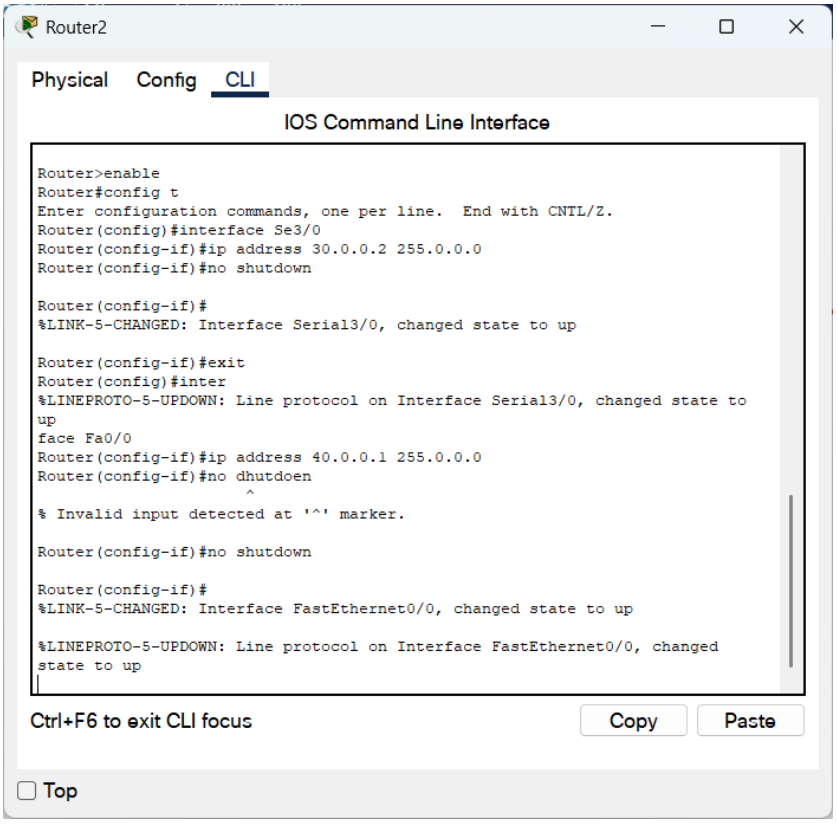
Router0 configuration



Router1 configuration

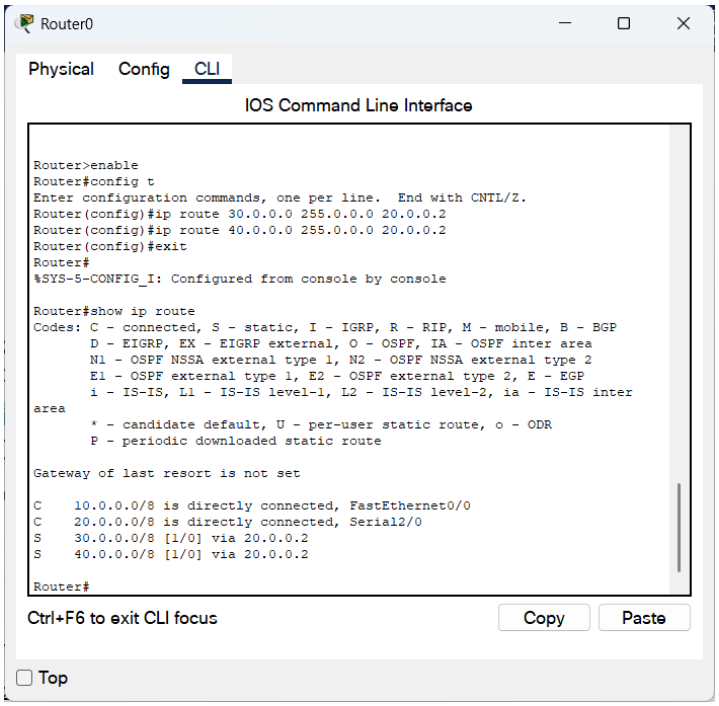


Router2 configuration

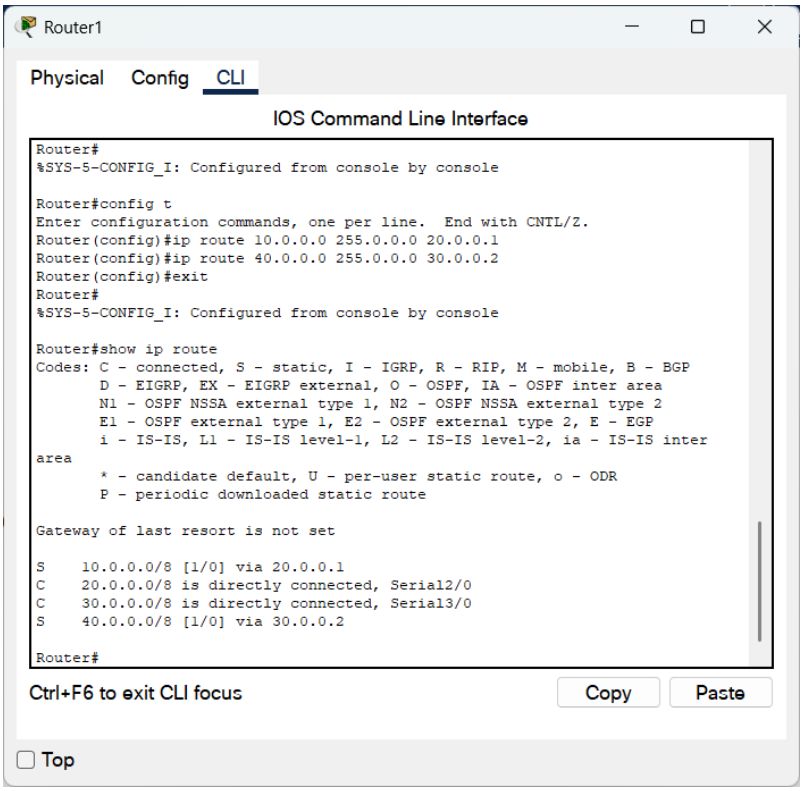


Static Routing:

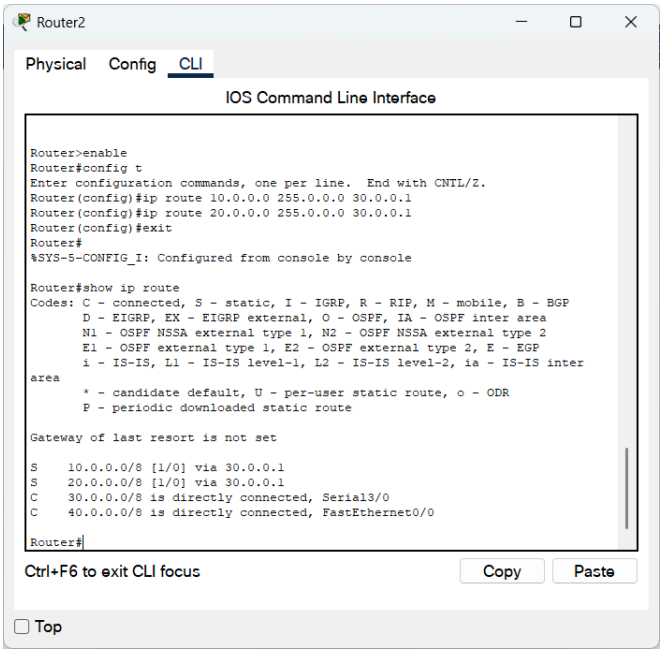
Router0



Router1

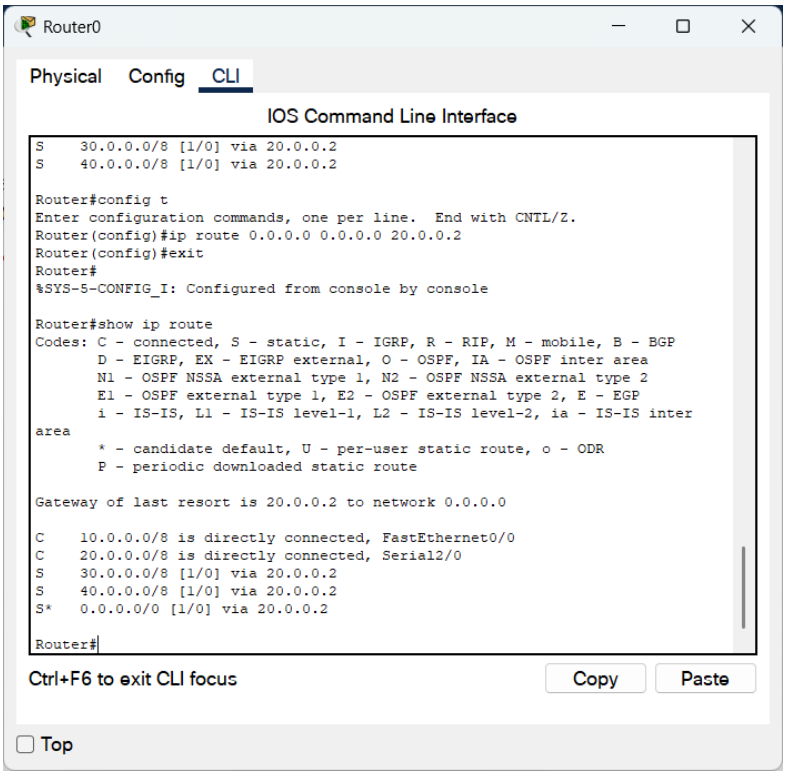


Router2

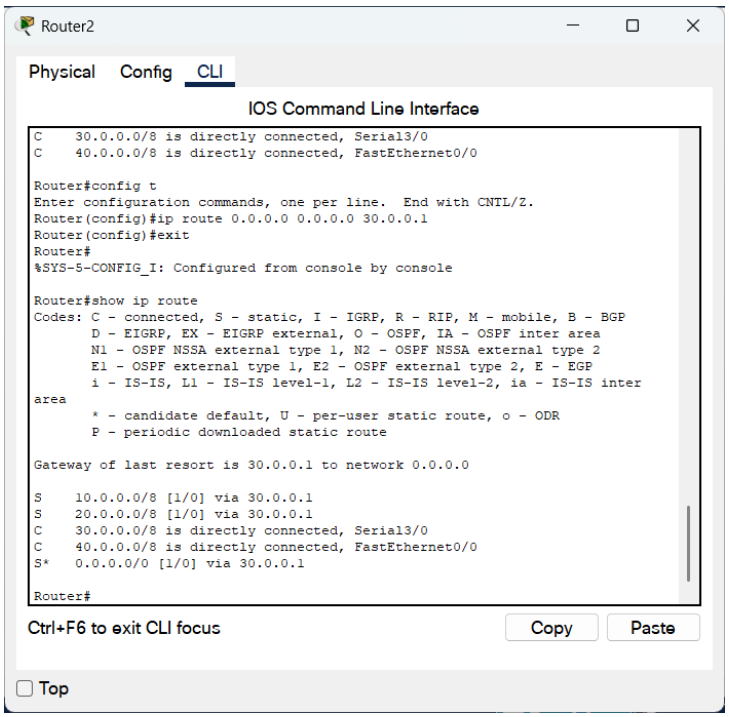


Dynamic Routing:

Route0



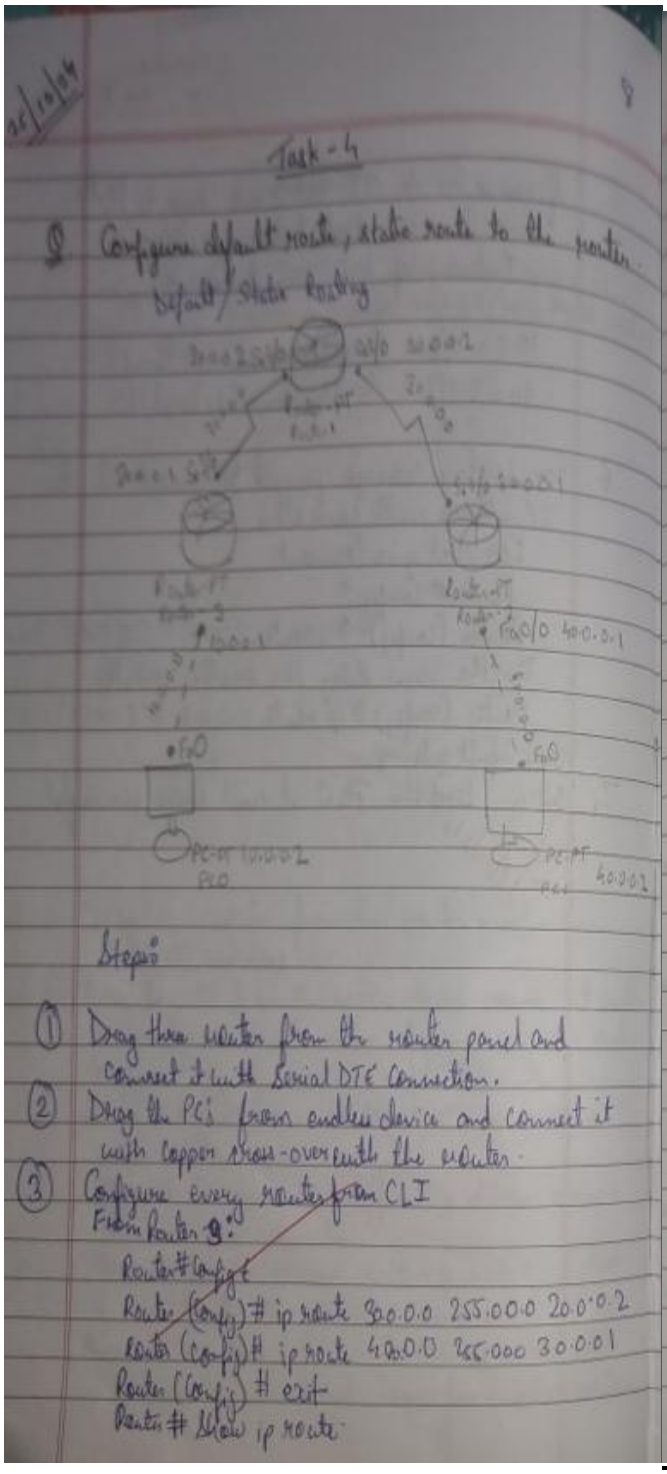
Router2



Pinging:

```
C:\>ping 40.0.0.2

Pinging 40.0.0.2 with 32 bytes of data:

Reply from 40.0.0.2: bytes=32 time=21ms TTL=125
Reply from 40.0.0.2: bytes=32 time=17ms TTL=125
Reply from 40.0.0.2: bytes=32 time=25ms TTL=125
Reply from 40.0.0.2: bytes=32 time=2ms TTL=125

Ping statistics for 40.0.0.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 2ms, Maximum = 25ms, Average = 16ms
```

iv. Observation



Task - 4

Q. Configure default route, static route to the router.

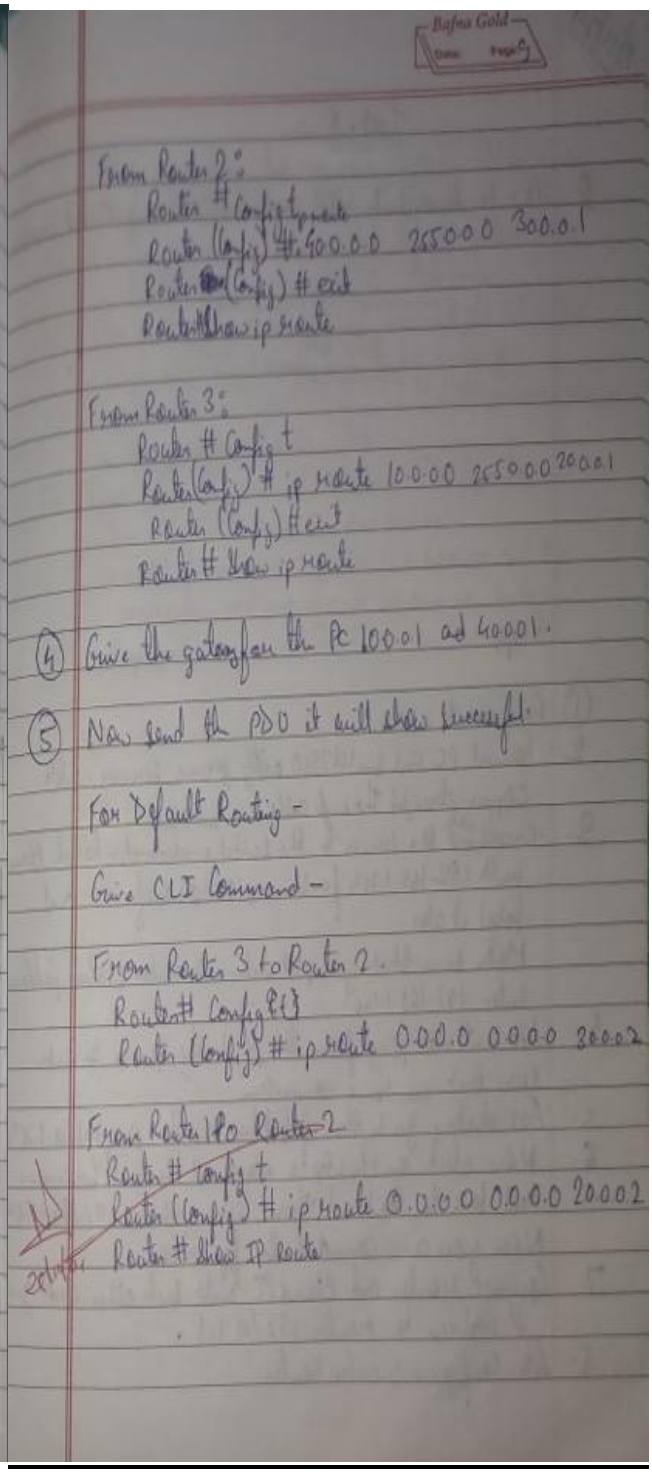
Default / Static Routing

Steps:

1. Drag three router from the router panel and connect it with Serial DTE Connection.
2. Drag the PCs from end device and connect it with copper cross-over with the router.
3. Configure every router from CLI

From Router 1:

Router# Config t
Router (Config)# ip route 30.0.0 255.000 20.0.0.2
Router (Config)# ip route 40.0.0 255.000 30.0.01
Router (Config)# exit
Router# show ip route



From Router 2:

Router # Config t
Router (Config) # 40.0.0.0 255.0.0.0 30.0.1
Router (Config) # exit
Router# show ip route

From Router 3:

Router # Config t
Router (Config) # ip route 10.0.00 255.0.0.0 20.0.1
Router (Config) # exit
Router # show ip route

4. Give the gateway for the PC 10.0.1 and 40.0.1.
5. Now send the PDU it will show successful.

For Default Routing -

Give CLI Command -

From Router 3 to Router 2.

Router# Config t
Router (Config) # ip route 0.0.0.0 0.0.0.0 30.0.2

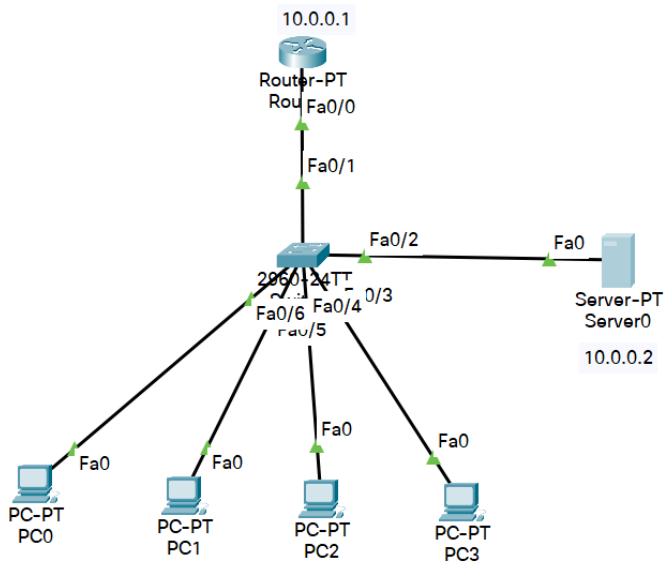
From Router 1 to Router 2

Router # config t
Router (Config) # ip route 0.0.0.0 0.0.0.0 20.0.2
Router # show IP route

Program 4

i. Configure DHCP within a LAN and outside LAN.

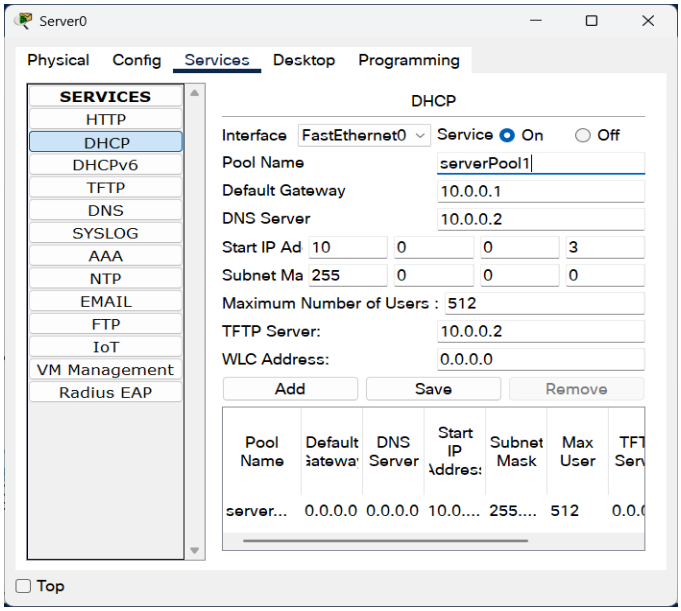
ii. Procedure along with the topology



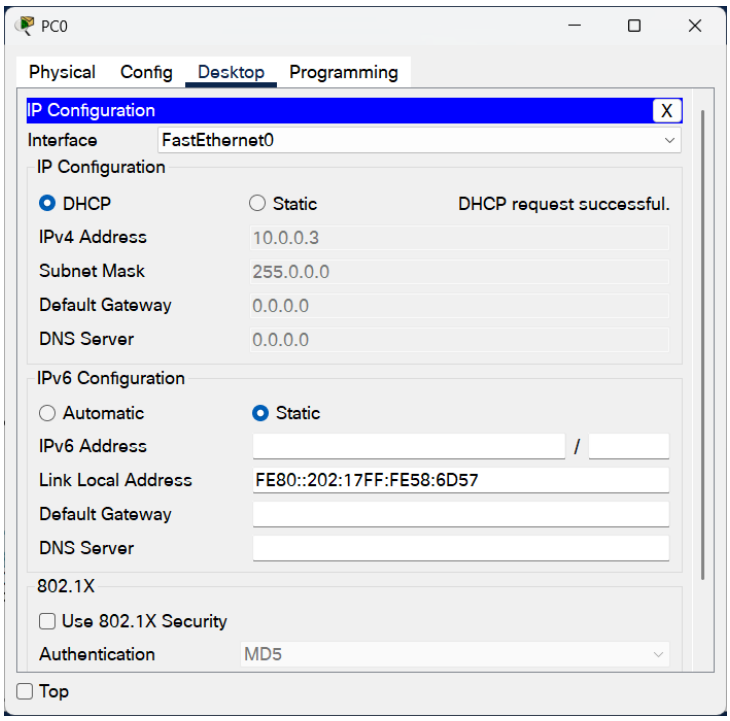
iii. Screen shots/ output

DHCP Within LAN

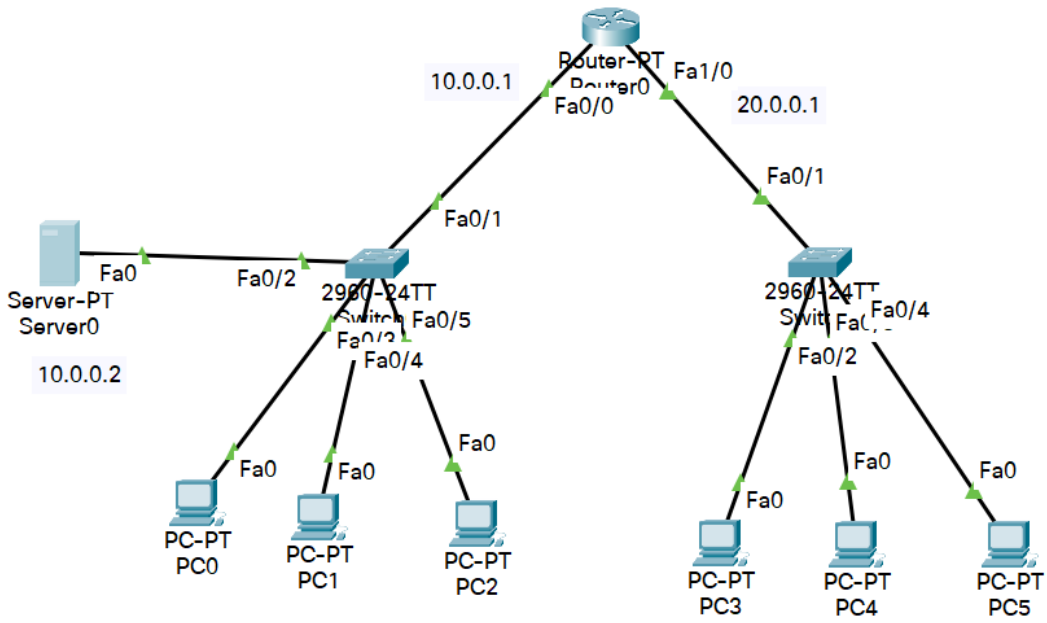
DHCP Configuration



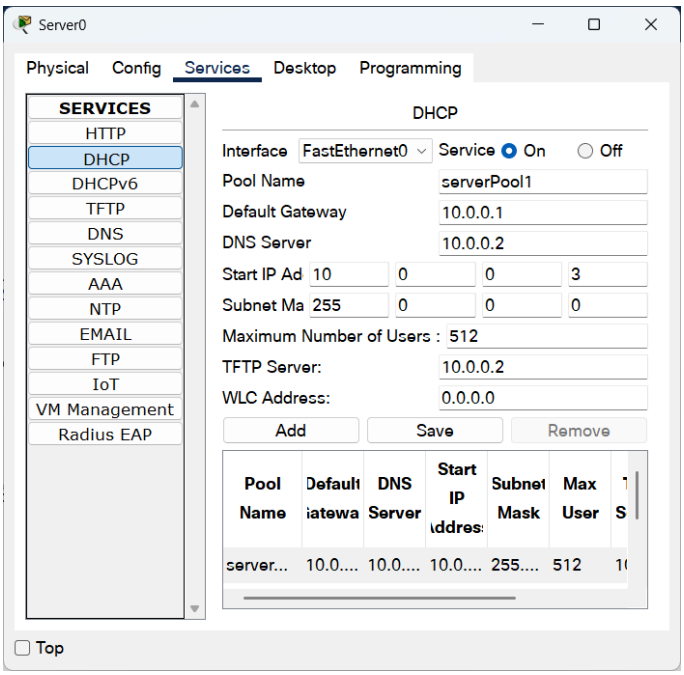
PC settings



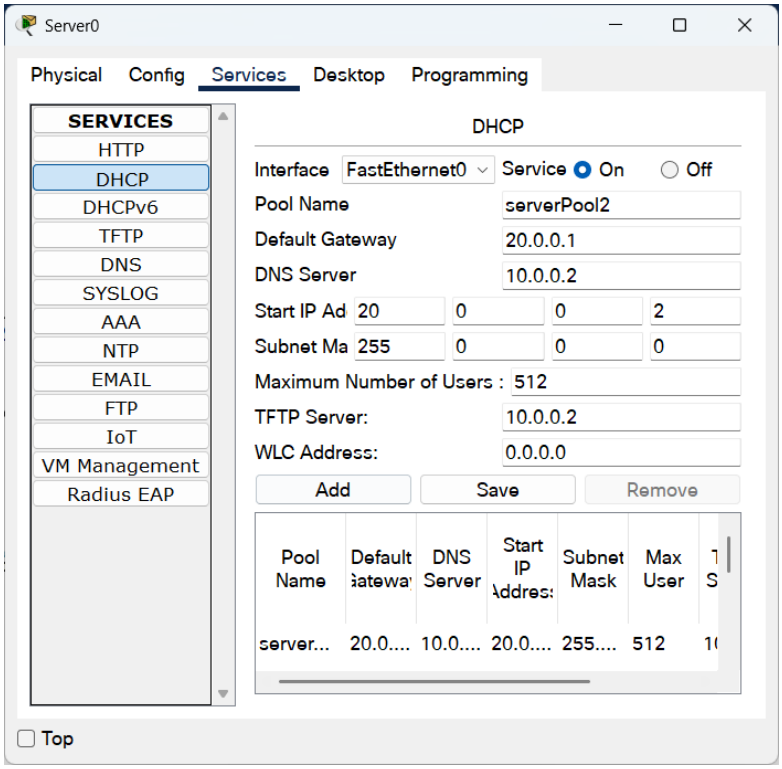
DHCP outside LAN:



DHCP configuration for inside LAN



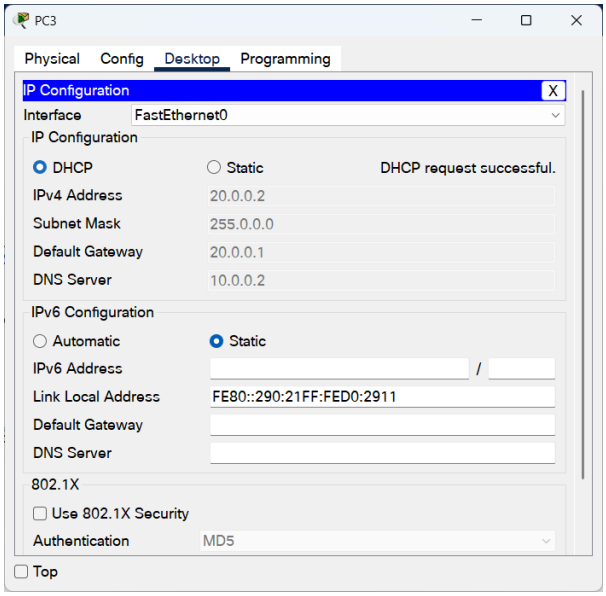
DHCP configuration for outside LAN



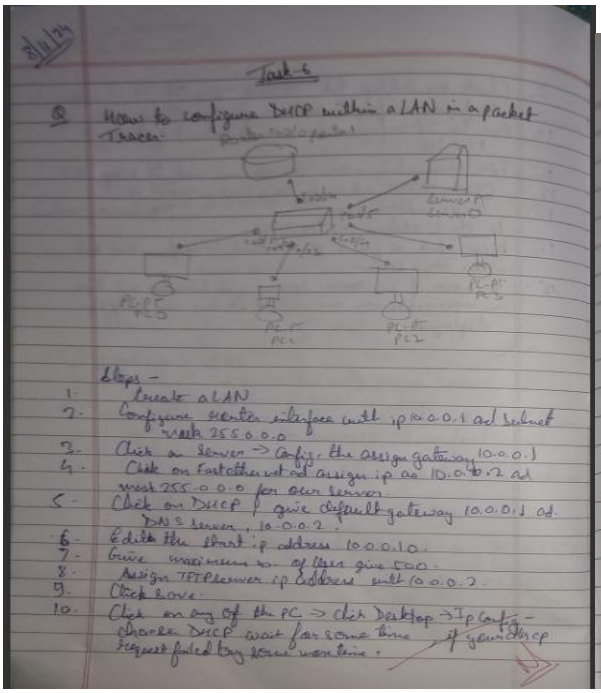
Ip helper command in Router

```
Router(config-if)#exit
Router(config)#interface Fa1/0
Router(config-if)#ip helper-address 10.0.0.2
Router(config-if)#
```

PC setting in another network



iv. Observation

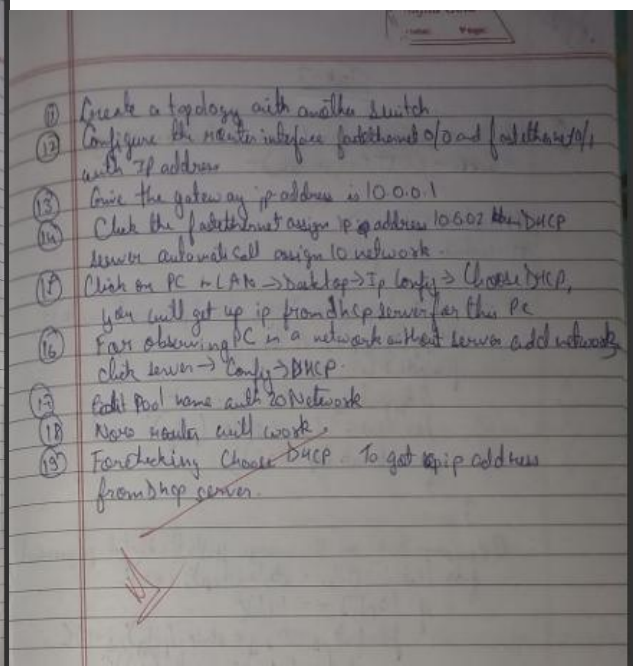


Task-6

Q. How to configure DHCP within a LAN in a packet Tracer.

Steps -

1. Create a LAN
2. Configure router interface with ip 10.0.0.1 and subnet mask 255.0.0.0
3. Click on server → Config, the assign gateway 10.0.0.1
4. Click on FastEthernet and assign ip as 10.0.0.2 and mask 255.0.0.0 for our server.
5. Click on DHCP, give default gateway 10.0.0.1 and DNS server, 10.0.0.2.
6. Edit the start ip address 10.0.0.10.
7. Give maximum no. of users give 500.
8. Assign TFTP server ip address with 10.0.0.2
9. Click save.
10. Click on any of the PC → click Desktop → Ip Config - Choose DHCP wait for some time, if your dhcp request failed by some reason.

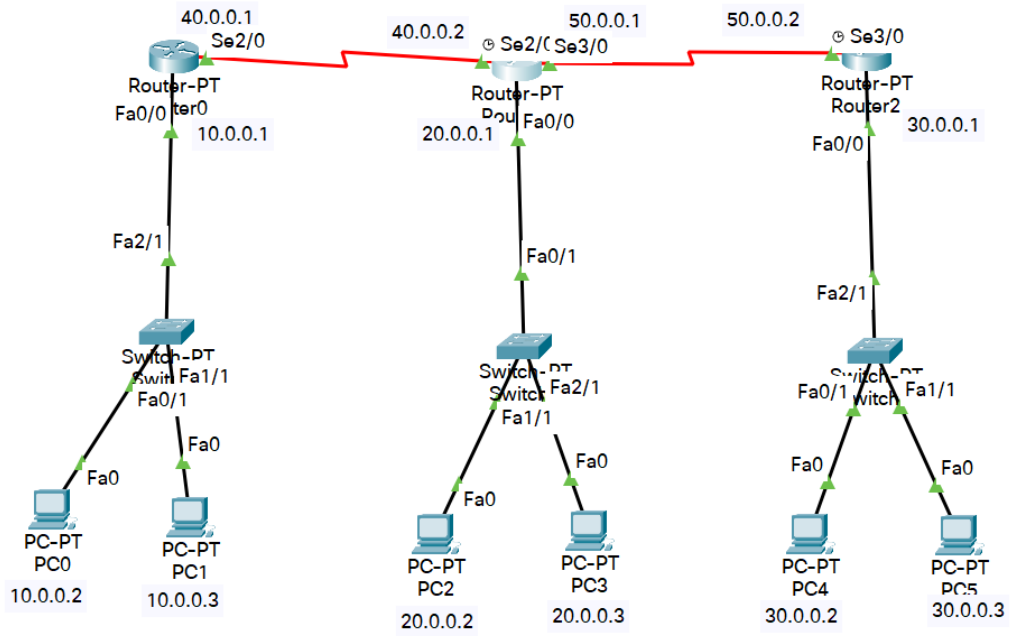


11. Create a topology with another switch
12. Configure the router interface fastethernet 0/0 and fastethernet 0/1 with IP address
13. Give the gateway ip address is 10.0.0.1
14. Click the fastethernet assign ip address 10.0.0.2 the DHCP server automatically assign 10 network.
15. Click on PC → LAN → Desktop → Ip Config → Choose DHCP, you will get up ip from dhcp server for the PC
16. For observing PC in a network without server add network click server → Config → DHCP.
17. Edit Pool name with 20 Network
18. Now router will work.
19. For checking Choose DHCP. To get ip address from dhcp server.

Program 5

i. Configure RIP routing Protocol in Routers

ii. Procedure along with the topology



iii. Screen shots/ output

Router0

```
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#router rip
Router(config-router)#network 10.0.0.0
Router(config-router)#network 40.0.0.0
Router(config-router)#end
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter
area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

C    10.0.0.0/8 is directly connected, FastEthernet0/0
C    40.0.0.0/8 is directly connected, Serial2/0
```

Router1

```
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#router rip
Router(config-router)#network 40.0.0.0
Router(config-router)#network 50.0.0.0
Router(config-router)#network 20.0.0.0
Router(config-router)#end
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter
area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

R    10.0.0.0/8 [120/1] via 40.0.0.1, 00:00:08, Serial2/0
C    20.0.0.0/8 is directly connected, FastEthernet0/0
R    30.0.0.0/8 [120/1] via 50.0.0.2, 00:00:10, Serial3/0
C    40.0.0.0/8 is directly connected, Serial2/0
C    50.0.0.0/8 is directly connected, Serial3/0
```

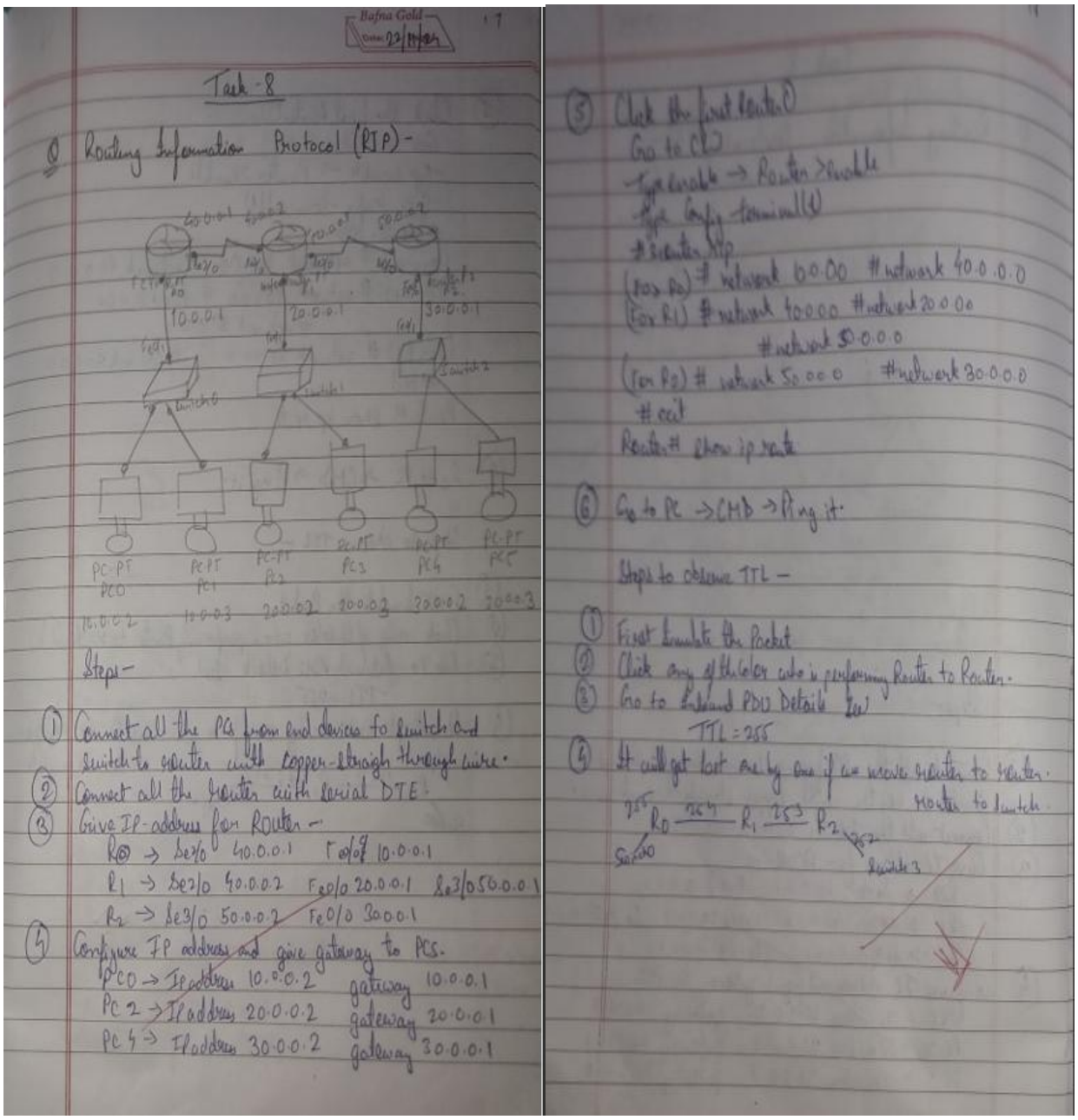
Router2

```
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#router rip
Router(config-router)#network 30.0.0.0
Router(config-router)#network 50.0.0.0
Router(config-router)#end
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter
area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

R    10.0.0.0/8 [120/2] via 50.0.0.1, 00:00:28, Serial3/0
R    20.0.0.0/8 [120/1] via 50.0.0.1, 00:00:28, Serial3/0
C    30.0.0.0/8 is directly connected, FastEthernet0/0
R    40.0.0.0/8 [120/1] via 50.0.0.1, 00:00:28, Serial3/0
C    50.0.0.0/8 is directly connected, Serial3/0
```

Pinging:

```
Packet Tracer PC Command Line 1.0
C:\>ping 20.0.0.2

Pinging 20.0.0.2 with 32 bytes of data:

Request timed out.
Reply from 20.0.0.2: bytes=32 time=9ms TTL=126
Reply from 20.0.0.2: bytes=32 time=1ms TTL=126
Reply from 20.0.0.2: bytes=32 time=9ms TTL=126

Ping statistics for 20.0.0.2:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 9ms, Average = 6ms
```

iv. Observation



Task - 8

Q Routing Information Protocol (RIP) -

Steps -

1. Connect all the PCs from end devices to switch and switch to router with copper-straight through wire.
2. Connect all the router with serial DTE.
3. Give IP-address for Router -
   R0 → Se2/0 40.0.0.1 Fe0/0 10.0.0.1
   R1 → Se2/0 40.0.0.2 Fe0/0 20.0.0.1 Se3/0 50.0.0.1
   R2 → Se3/0 50.0.0.2 Fe0/0 30.0.0.1
4. Configure IP address and give gateway to PCs.
   PC0 → IP address 10.0.0.2 gateway 10.0.0.1
   PC 2 → IP address 20.0.0.2 gateway 20.0.0.1
   PC 4 → IP address 30.0.0.2 gateway 30.0.0.1
5. Click the first Router
   Go to CLI
   Type enable → Router > enable
   Type config terminal
   # router rip
   (For R0) # network 60.0.0 # network 40.0.0.0
   (For R1) # network 40.0.0 # network 20.0.0
   # network 50.0.0.0
   (For R2) # network 50.0.0 # network 30.0.0.0
   # exit
   Router# show ip route
6. Go to PC → CMD → Ping it.

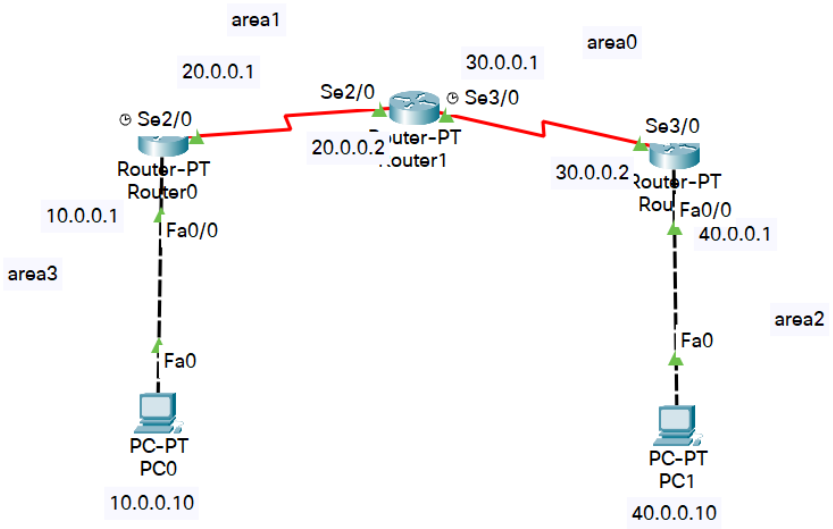
Steps to observe TTL -

1. First simulate the Packet
2. Click any of the later who is performing Router to Router.
3. Go to Inbound PDU Details
   TTL = 255
4. It will get lost one by one if we move router to router. router to switch.

Program 6

i. Configure OSPF routing protocol

ii. Procedure along with the topology



iii. Screen shots/ output

Encapsulation:

Router0

```
Router>enable
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#interface Fa0/0
Router(config-if)#ip address 10.0.0.1 255.0.0.0
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed
state to up

Router(config-if)#exit
Router(config)#interface Se2/0
Router(config-if)#ip address 20.0.0.1 255.0.0.0
Router(config-if)#encapsulation ppp
Router(config-if)#clock rate 64000
Router(config-if)#no shutdown

%LINK-5-CHANGED: Interface Serial2/0, changed state to down
Router(config-if)#exit
Router(config)#
```

Router1

```
Router>enable
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#interface Se2/0
Router(config-if)#ip address 20.0.0.2 255.0.0.0
Router(config-if)#encapsulation ppp
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface Serial2/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to
up

Router(config-if)#exit
Router(config)#interface Se3/0
Router(config-if)#ip address 30.0.0.1 255.0.0.0
Router(config-if)#encapsulation ppp
Router(config-if)#clock rate 64000
Router(config-if)#no dhutdown
                    ^
% Invalid input detected at '^' marker.

Router(config-if)#no shutdown
```

Router2

```
Router>enable
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#interface Fa0/0
Router(config-if)#ip address 40.0.0.1 255.0.0.0
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed
state to up
%IP-4-DUPADDR: Duplicate address 40.0.0.1 on FastEthernet0/0, sourced by
000D.BDDA.0123

Router(config-if)#exit
Router(config)#interface Se3/0
Router(config-if)#ip address 30.0.0.2 255.0.0.0
Router(config-if)#encapsulation ppp
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface Serial3/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/0, changed state to
up
```

OSPF Routing Protocol

Router0

```
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#router ospf 1
Router(config-router)#router-id 1.1.1.1
Router(config-router)#network 10.0.0.0 0.255.255.255 area 3
Router(config-router)#network 20.0.0.0 0.255.255.255 area 1
Router(config-router)#end
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#sho
00:27:19: %OSPF-5-ADJCHG: Process 1, Nbr 2.2.2.2 on Serial2/0 from LOADING to FULL, Loading Done
w ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

C    10.0.0.0/8 is directly connected, FastEthernet0/0
     20.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C       20.0.0.0/8 is directly connected, Serial2/0
C       20.0.0.2/32 is directly connected, Serial2/0
O IA 30.0.0.0/8 [110/128] via 20.0.0.2, 00:00:02, Serial2/0
O IA 40.0.0.0/8 [110/129] via 20.0.0.2, 00:00:02, Serial2/0
```

Router1

```
Router>enable
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#router ospf 1
Router(config-router)#router-id 2.2.2.2
Router(config-router)#network 20.0.0.0 0.255.255.255 area 1
Router(config-router)#network 30.0.0.0 0.255.255.255 area 0
Router(config-router)#end
Router#
%SYS-5-CONFIG_I: Configured from console by console

00:26:21: %OSPF-5-ADJCHG: Process 1, Nbr 3.3.3.3 on Serial3/0 from LOADING to FULL, Loading Done

00:27:18: %OSPF-5-ADJCHG: Process 1, Nbr 1.1.1.1 on Serial2/0 from LOADING to FULL, Loading Done

Router#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

     20.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C       20.0.0.0/8 is directly connected, Serial2/0
C       20.0.0.1/32 is directly connected, Serial2/0
     30.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C       30.0.0.0/8 is directly connected, Serial3/0
C       30.0.0.2/32 is directly connected, Serial3/0
O IA 40.0.0.0/8 [110/65] via 30.0.0.2, 00:02:00, Serial3/0
```

Router2

```
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#router ospf 1
Router(config-router)#router-id 3.3.3.3
Router(config-router)#network 40.0.0.0 0.255.255.255 area 2
Router(config-router)#network 30.0.0.0 0.255.255.255 area 0
Router(config-router)#end
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#
00:26:19: %OSPF-5-ADJCHG: Process 1, Nbr 2.2.2.2 on Serial3/0 from LOADING to FULL, Loading Done

Router#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

O IA 20.0.0.0/8 [110/128] via 30.0.0.1, 00:02:45, Serial3/0
     30.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C       30.0.0.0/8 is directly connected, Serial3/0
C       30.0.0.1/32 is directly connected, Serial3/0
C    40.0.0.0/8 is directly connected, FastEthernet0/0
```

Configure Loopback address

Router0

```
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#interface loopback 0

Router(config-if)#
%LINK-5-CHANGED: Interface Loopback0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback0, changed state to
up

Router(config-if)#ip address 172.16.1.252 255.255.0.0
Router(config-if)#no shutdown
```

Router1

```
Router>enable
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#interface loopback 0

Router(config-if)#
%LINK-5-CHANGED: Interface Loopback0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback0, changed state to
up

Router(config-if)#ip address 172.16.1.253 255.255.0.0
Router(config-if)#no shutdown
Router(config-if)#
```

Router2

```
Router>enable
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#interface loopback 0

Router(config-if)#
%LINK-5-CHANGED: Interface Loopback0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback0, changed state to
up

Router(config-if)#ip address 172.16.1.254 255.255.0.0
Router(config-if)#no shutdown
Router(config-if)#
```

Create Virtual Link

Router0

```
Router>enable
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#router ospf 1
Router(config-router)#area 1 virtual-link 2.2.2.2
Router(config-router)#
```

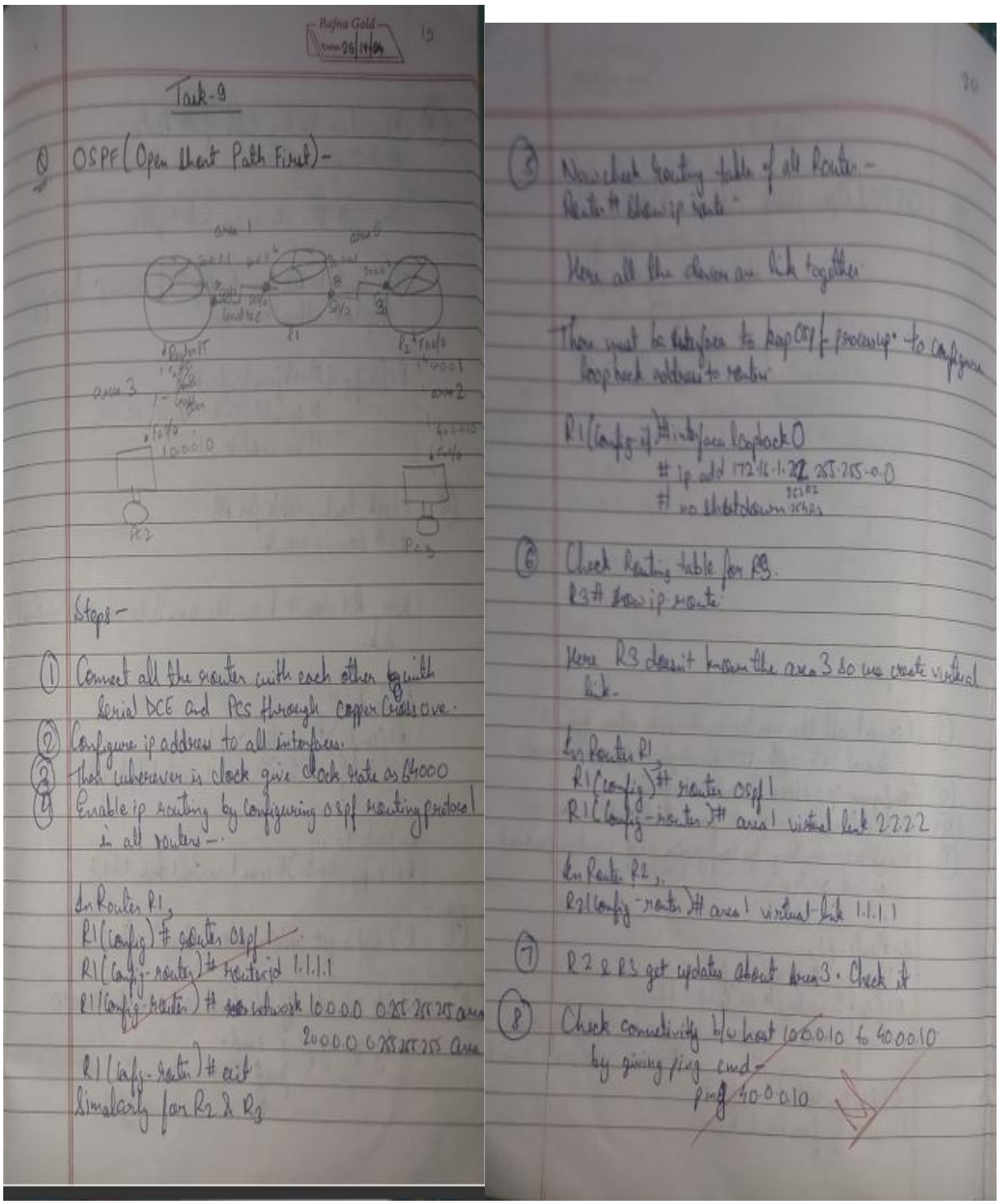
Router1

```
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#
01:11:01: %OSPF-4-ERRRCV: Received invalid packet: mismatch area ID, from
backbone area must be virtual-link but not found from 20.0.0.2, Serial2/0

01:11:11: %OSPF-4-ERRRCV: Received invalid packet: mismatch area ID, from
backbone area must be virtual-link but not found from 20.0.0.2, Serial2/0

Router(config)#route
01:11:21: %OSPF-4-ERRRCV: Received invalid packet: mismatch area ID, from
backbone area must be virtual-link but not found from 20.0.0.2, Serial2/0
r ospf 1
Router(config-router)#
01:11:31: %OSPF-4-ERRRCV: Received invalid packet: mismatch area ID, from
backbone area must be virtual-link but not found from 20.0.0.2, Serial2/0

Router(config-router)#area 1 v
01:11:41: %OSPF-4-ERRRCV: Received invalid packet: mismatch area ID, from
backbone area must be virtual-link but not found from 20.0.0.2, Serial2/0
irtual-link 1.1.1.1
Router(config-router)#
01:11:56: %OSPF-5-ADJCHG: Process 1, Nbr 1.1.1.1 on OSPF_VL0 from LOADING to
FULL, Loading Done
```

Pinging

```
C:\>ping 40.0.0.10

Pinging 40.0.0.10 with 32 bytes of data:

Reply from 40.0.0.10: bytes=32 time=24ms TTL=125
Reply from 40.0.0.10: bytes=32 time=18ms TTL=125
Reply from 40.0.0.10: bytes=32 time=18ms TTL=125
Reply from 40.0.0.10: bytes=32 time=20ms TTL=125

Ping statistics for 40.0.0.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 18ms, Maximum = 24ms, Average = 20ms
```

iv. Observation



Task-9

Q OSPF (Open Short Path First) -

Steps -

1. Connect all the router with each other with Serial DCE and PCs through copper Crossover.
2. Configure ip address to all interfaces.
3. Then whenever is clock give clock rate as 64000
4. Enable ip routing by configuring ospf routing protocol in all routers -

In Router R1,
R1(config) # router ospf 1
R1(config-router) # routerid 1.1.1.1
R1(config-router) # network 10.0.0.0 0.255.255.255 area 2000.0.0.255.255.255 area
R1(config-router) # exit
Similarly for R2 & R3

3. Now check routing table of all Router -
Router # show ip route

Here all the devices are link together

There must be interface to map OSPF process up - to configure loopback address to router

R1(config-if) # interface loopback 0
ip add 172.16.1.22 255.255.0.0
no shutdown

6. Check Routing table for R3.
R3# show ip route

Here R3 doesn't know the area 3 so we create virtual link.

In Router R1
R1(config) # router ospf 1
R1(config-router) # area 1 virtual link 2.2.2.2

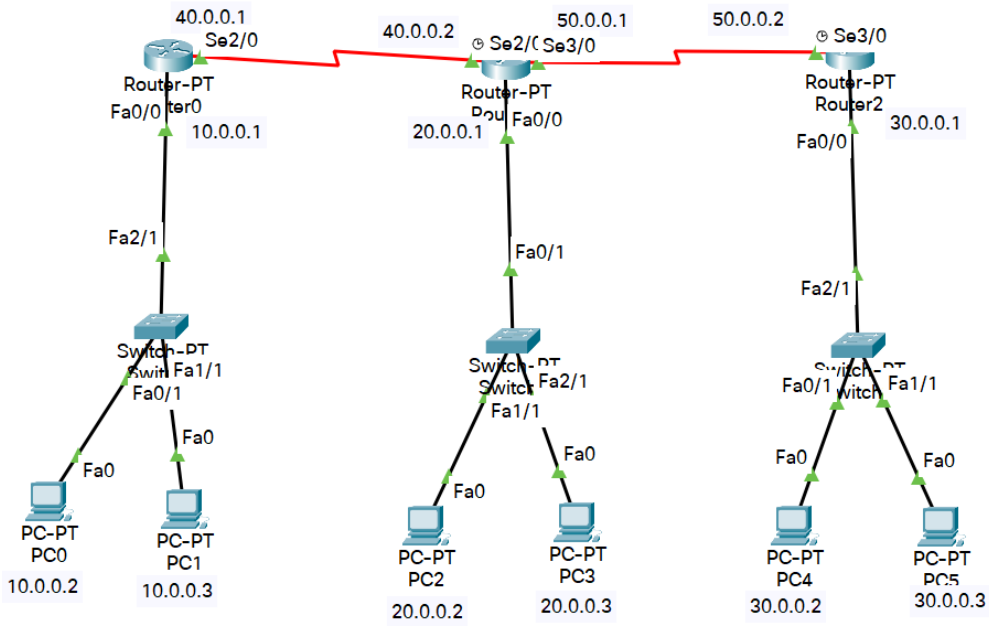
In Router R2,
R2(config-router) # area 1 virtual link 1.1.1.1

7. R2 & R3 get updates about area 3. Check it
8. Check connectivity b/w host 10.0.0.10 to 40.0.0.10 by giving ping cmd -
ping 40.0.0.10

Program 7

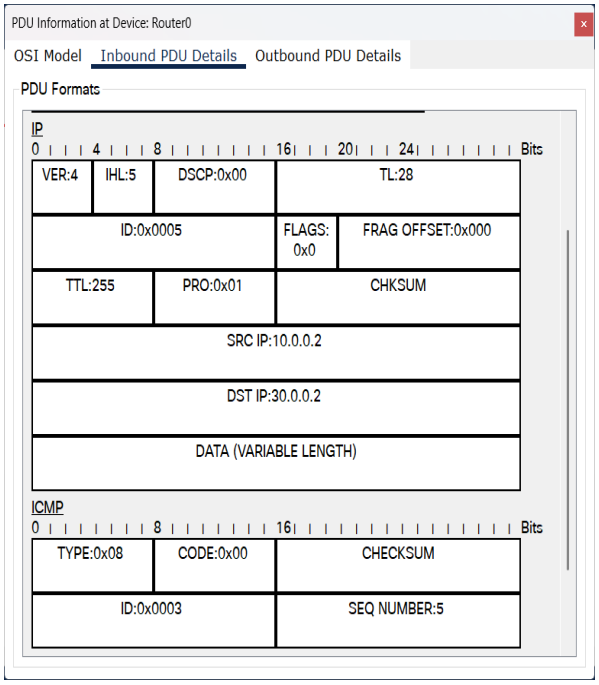
i. Demonstrate the TTL/ Life of a Packet

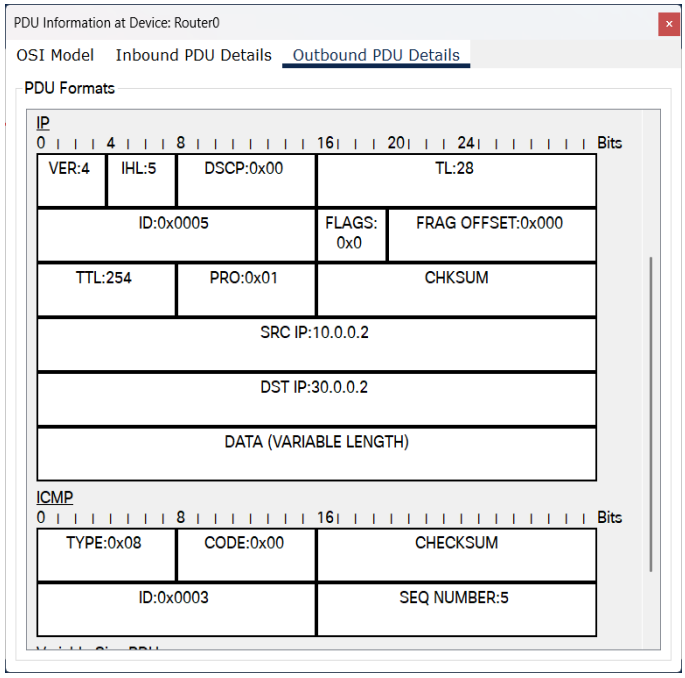
ii. Procedure along with the topology



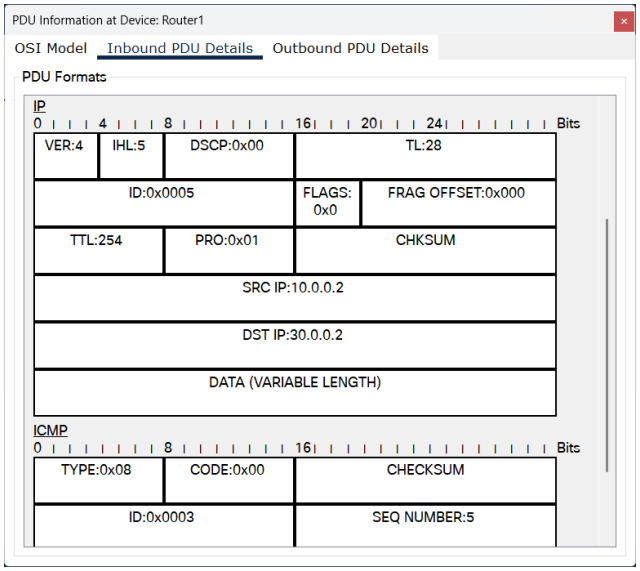
iii. Screen shots/ output

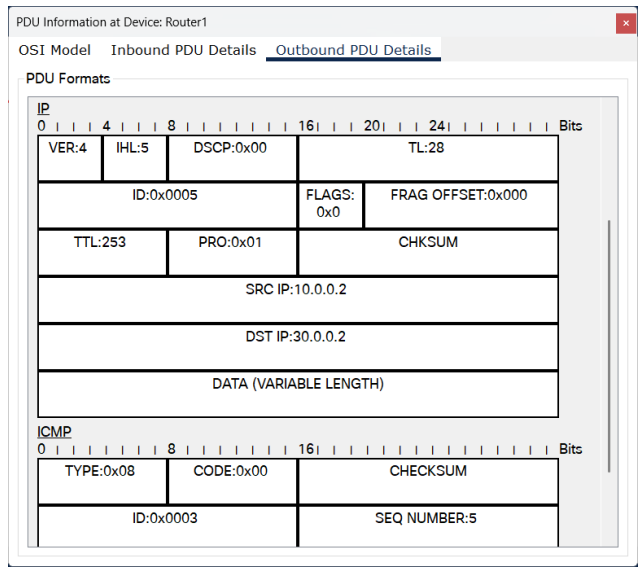
Packet at Router0



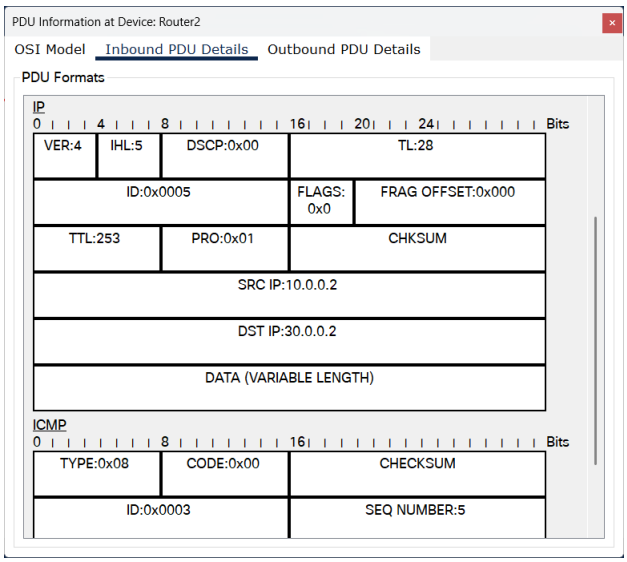


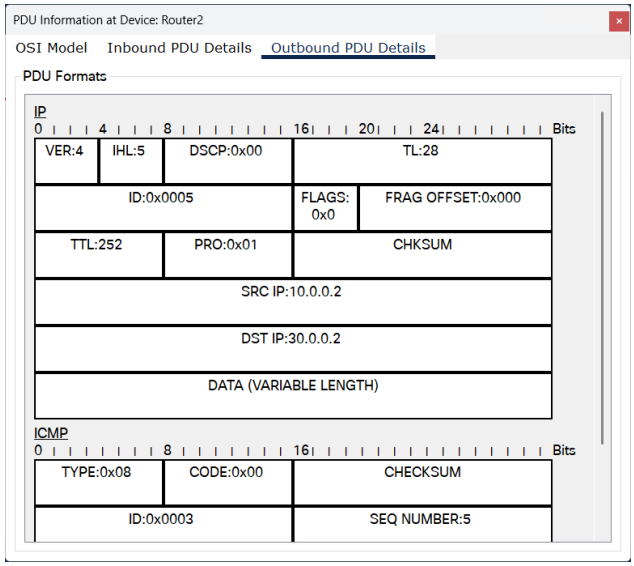
Packet at Router1



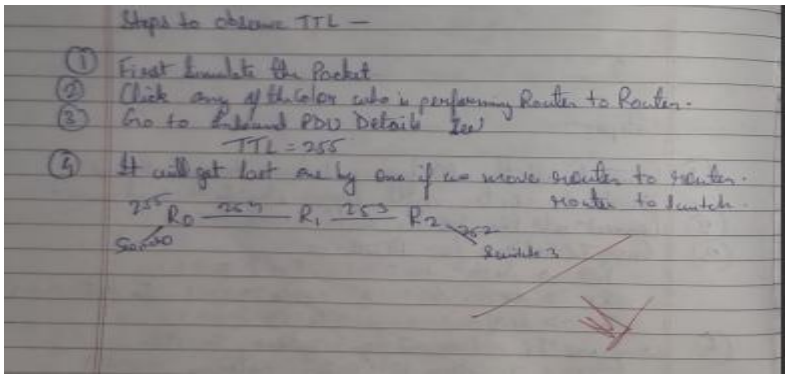


Packet at Router2





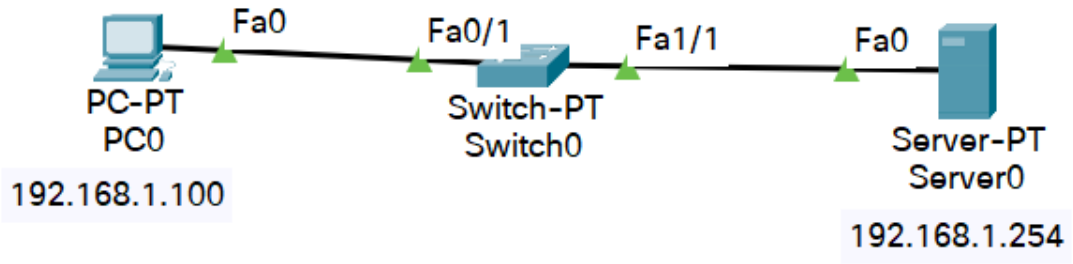
iv. Observation



Program 8

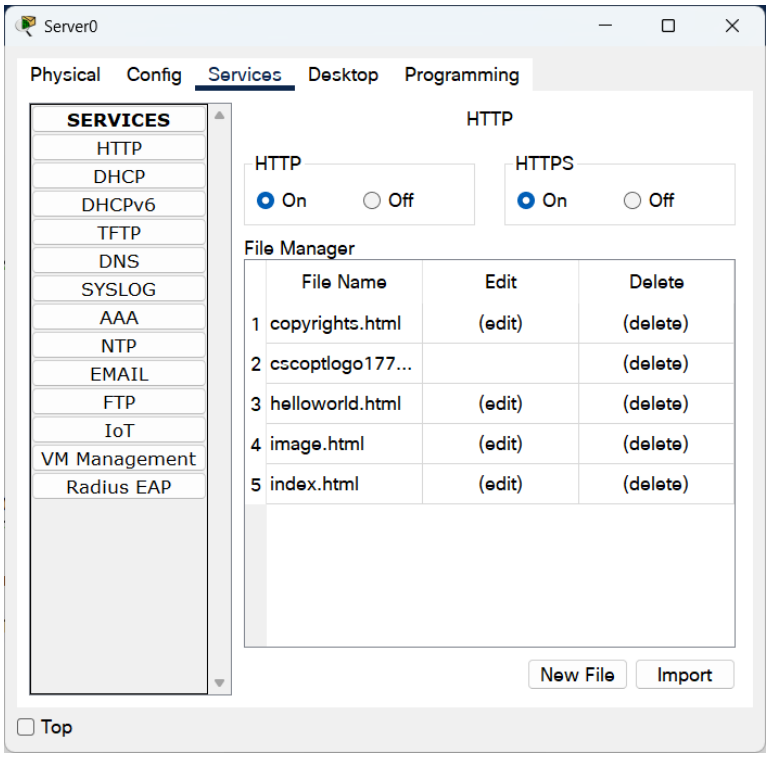
i. Configure Web Server, DNS within a LAN.

ii. Procedure along with the topology

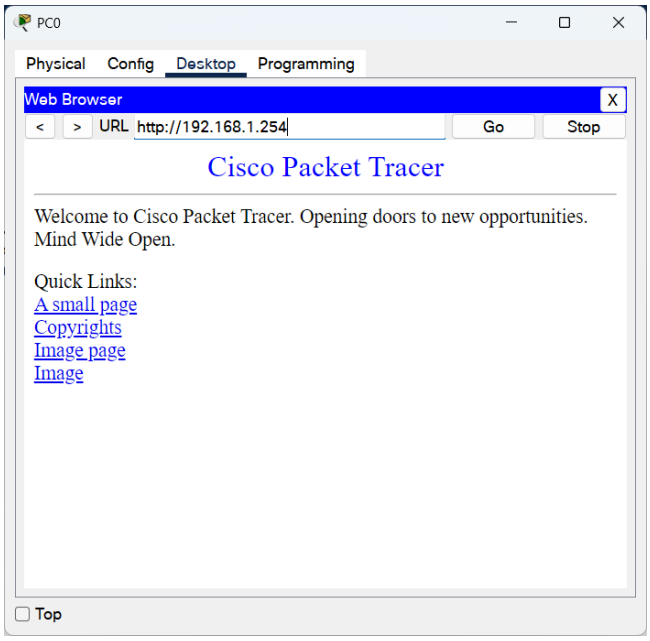


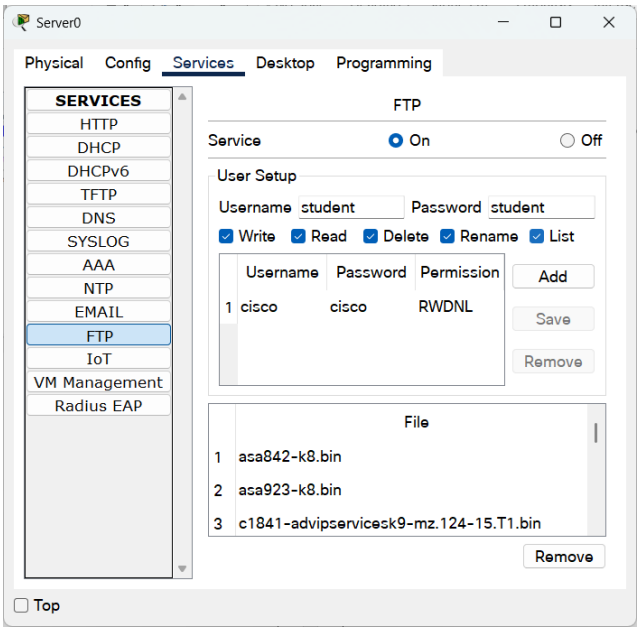
iii. Screen shots/ output

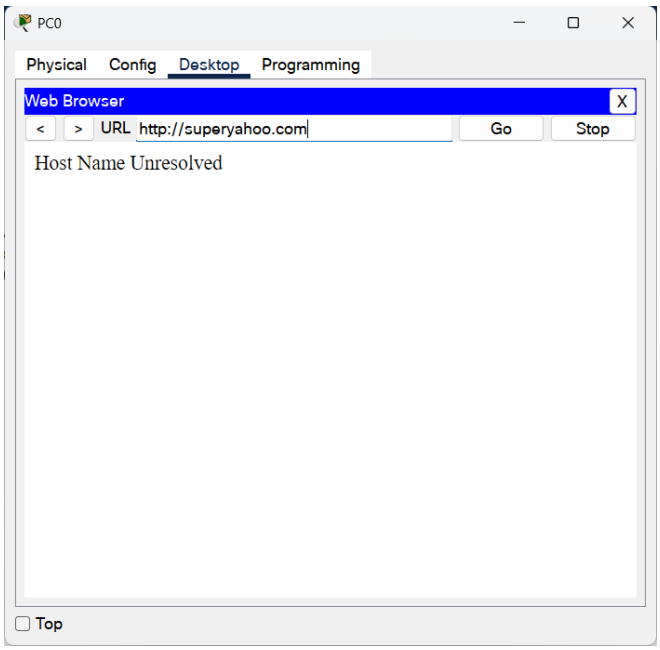
Server's services

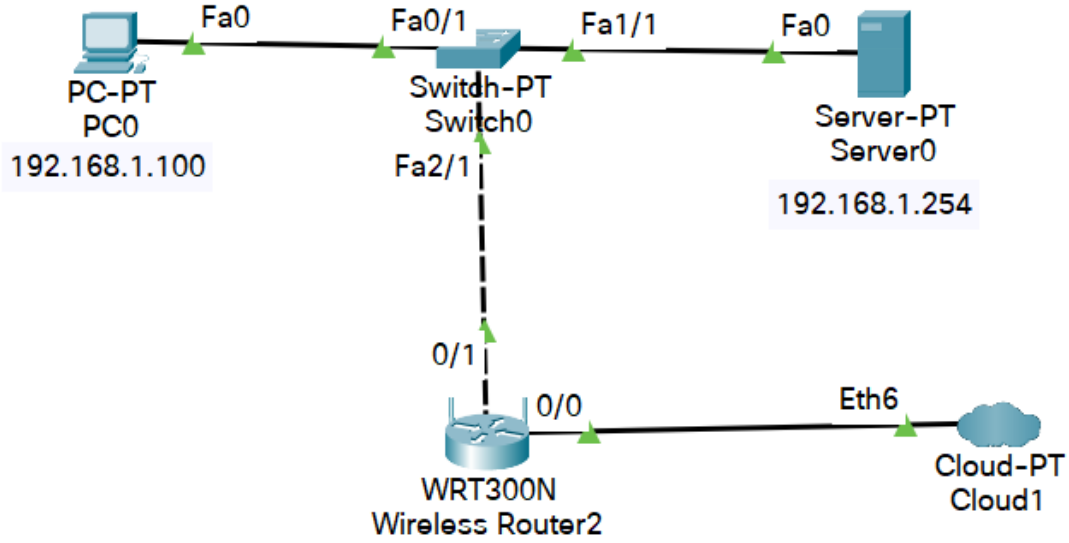


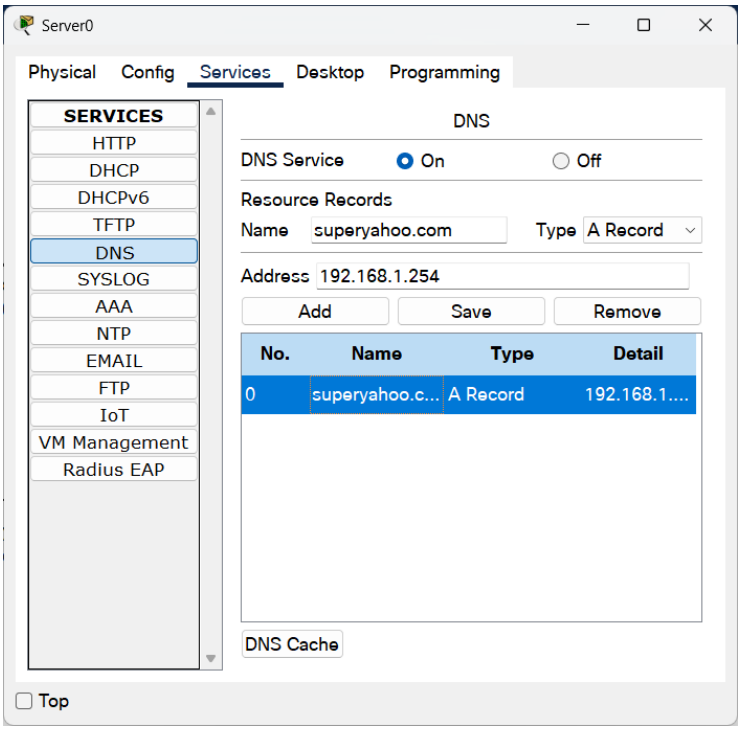
PC's Web Browser


PC0
Physical
Config
Desktop
Programming
Web Browser
URL http://192.168.1.254
Go
Stop
Cisco Packet Tracer
Welcome to Cisco Packet Tracer. Opening doors to new opportunities. Mind Wide Open.
Quick Links:
A small page
Copyrights
Image page
Image
Top


Server0
Physical
Config
Services
Desktop
Programming
SERVICES
HTTP
DHCP
DHCPv6
TFTP
DNS
SYSLOG
AAA
NTP
EMAIL
FTP
IoT
VM Management
Radius EAP
FTP
Service
On
Off
User Setup
Username student
Password student
Write
Read
Delete
Rename
List
Username
Password
Permission
1 cisco
cisco
RWDNL
Add
Save
Remove
File
1 asa842-k8.bin
2 asa923-k8.bin
3 c1841-advipservicesk9-mz.124-15.T1.bin
Remove
Top


PC0
Physical
Config
Desktop
Programming
Web Browser
URL http://superyahoo.com
Go
Stop
Host Name Unresolved
Top

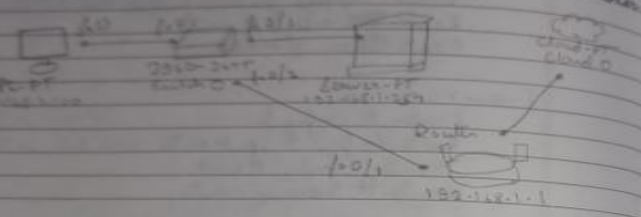

Fa0
Fa0/1
Fa1/1
Fa0
PC-PT
PC0
192.168.1.100
Switch-PT
Switch0
Server-PT
Server0
192.168.1.254
Fa2/1
0/1
0/0
Eth6
WRT300N
Wireless Router2
Cloud-PT
Cloud1


Server0
Physical
Config
Services
Desktop
Programming
SERVICES
HTTP
DHCP
DHCPv6
TFTP
DNS
SYSLOG
AAA
NTP
EMAIL
FTP
IoT
VM Management
Radius EAP
DNS
DNS Service
On
Off
Resource Records
Name
superyahoo.com
Type
A Record
Address
192.168.1.254
Add
Save
Remove
No.
Name
Type
Detail
0
superyahoo.c...
A Record
192.168.1....
DNS Cache
Top

iv. Observation

Task - 5

Q. How to demonstrate WEB server and DNS using Packet Tracer



Steps-

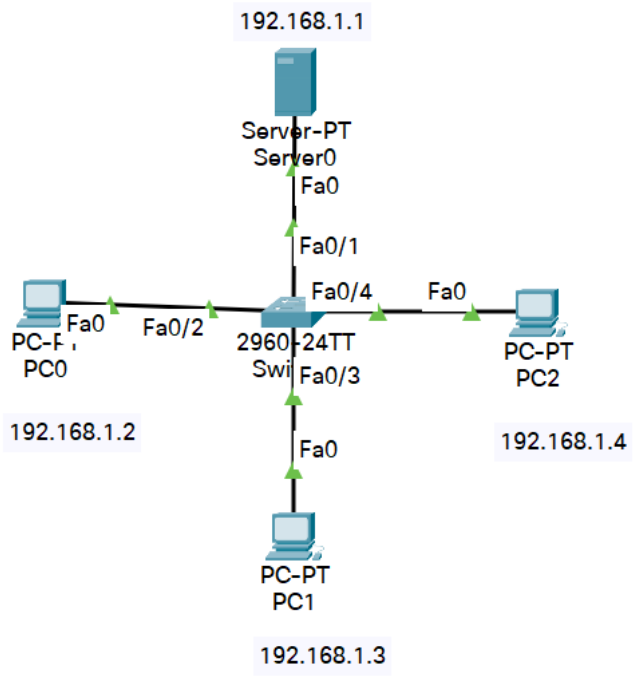
1. First create a LAN.
2. Connect PC and switch 2960 with generic server with copper straight through cable.
3. Connect the server & the switch, and PC label them with 192.168.1.254 for server, 192.168.1.200 for PC and label it also.
   Make sure that your port status is on under state ipaddress enter 192.168.1.100.
4. We will now ping from the pc to the server to make sure that we have connection.
5. For checking go to the desktop - Cmd - ping 192.168.1.254
6. Now click on the http to observed the web browser and look to the html there type ipaddress 192.168.1.254 Now you are connected to the server.
7. Connect router and Cloud PT with each other and give IP address to router 192.168.1.1.
8. Lets configure wireless router.

9. Click on desktop tab → Cmd - ping 192.168.1.1, now configure default gateway from the PC.
10. Go to IP Configuration give it default gateway as 192.168.1.1.
11. For connecting more server we need to setup DNS.
12. Click on DNS and make sure that is turned on.
13. Under address type: 192.168.1.254 so superyahoo.com resolved to the ipaddress 192.168.1.254
14. Now click on your pc and click IP Configuration and under that servers we see our server.
15. So now if we open up our web browser and type in superyahoo.com we should see our new webpage displayed.

Program 9

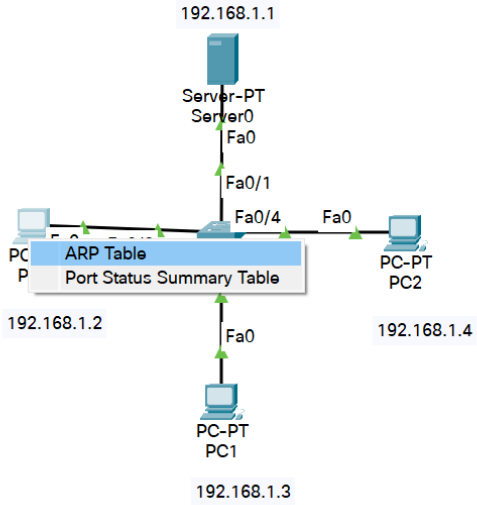
i. To construct simple LAN and understand the concept and operation of Address Resolution Protocol (ARP)

ii. Procedure along with the topology

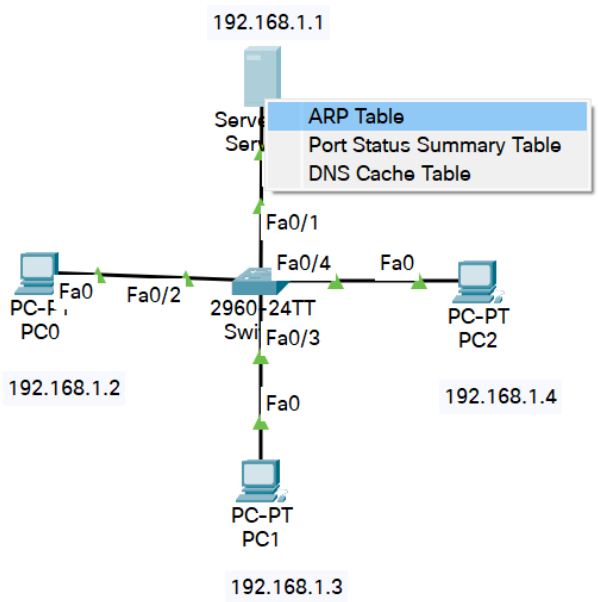


iii. Screen shots/ output

ARP Table of PC



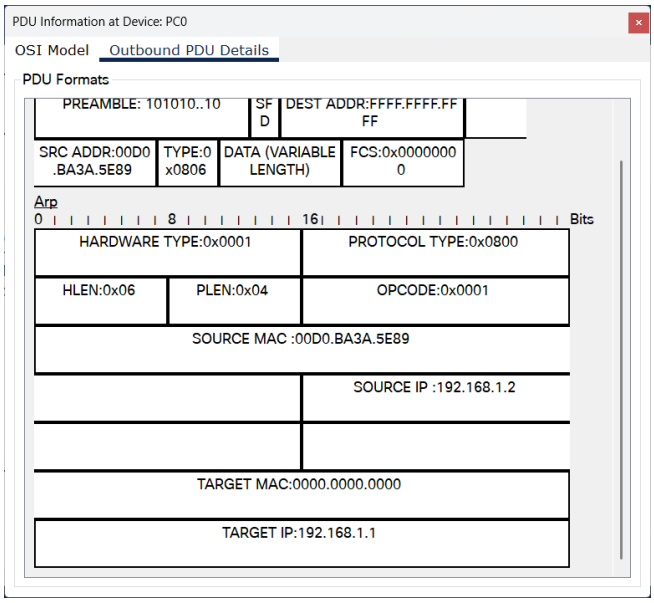
ARP Table of Server

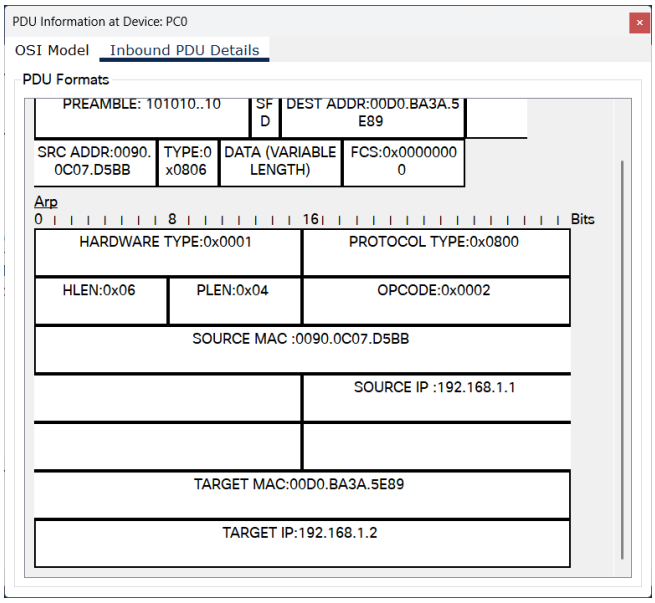


Command at PC

```
Packet Tracer PC Command Line 1.0
C:\>arp -a
No ARP Entries Found
C:\>
```

Pinging in Simulation Mode

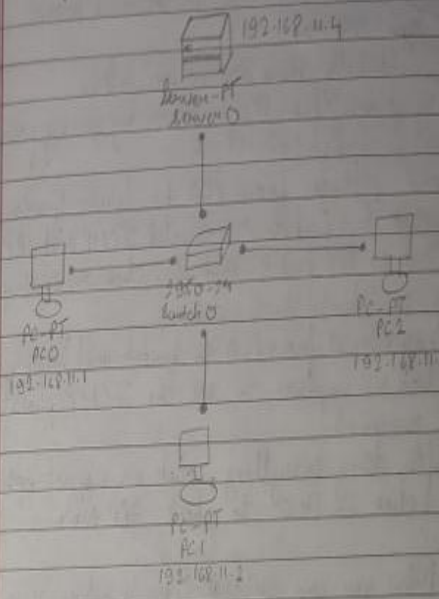




iv. Observation

Task 10

Q. To construct simple LAN and understand the concept and operation of Address Resolution Protocol.



Steps –

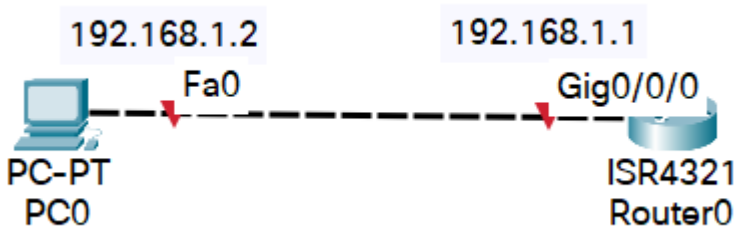
1. Drage Switch 2950-24 from Switch Panel, Server-PT from hub and two PC from end device. Connect all through switch using Copper Straight Through wire.
2. Assign IP address to all PCs and Server with 192.168.11.1, 192.168.11.2, 192.168.11.3, 192.168.11.4
3. Go to simulation panel, click on inspect and right click on PC0 (ie. Search option).
4. After clicking on PC0 click ARP table and notice that no entries are there in ARP table. Repeat same for Server.
5. Click on PC0 and go to command prompt. Type arp -a. Initially there are no ARP entries.
6. Try pinging from PC0 to Server by giving command - ping 192.168.11.4.
7. Send package from PC0 to Server you can notice that two packets are created ICMP and ARP
8. Click on ARP packet and then click on capture button to start the simulation.
9. Ping request from PC0 to Switch will happen.
10. Click on capture to see the ICMP packet received.
11. After doing everything, click on inspect option and click to PC0 to check ARP table.

Now you can see that there is entries present.

Program 10

i. To understand the operation of TELNET by accessing the router in server room from a PC in IT office.

ii. Procedure along with the topology

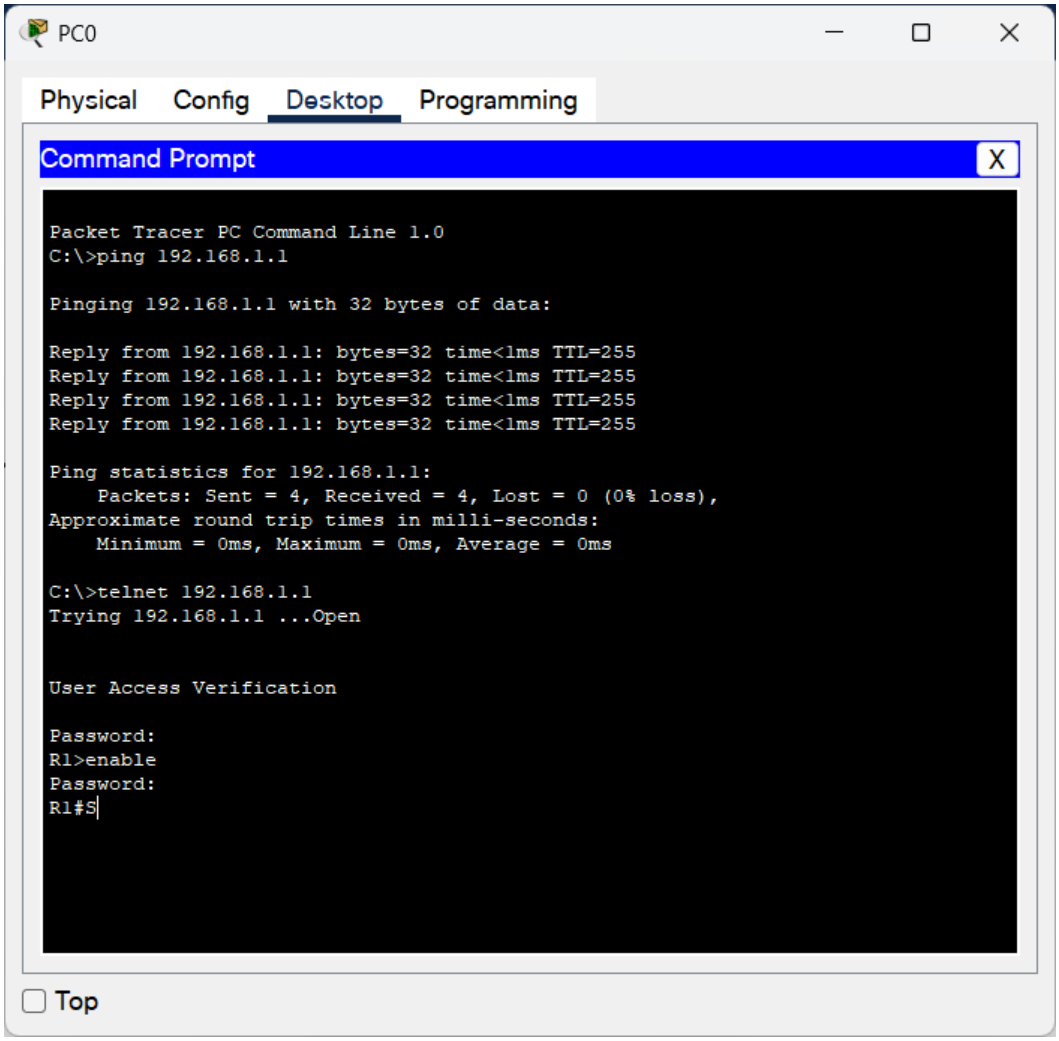


iii. Screen shots/ output

Router

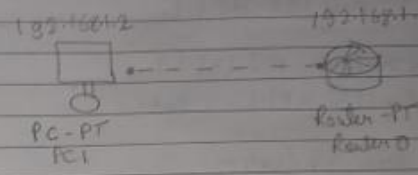
```
Router>enable
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#hostname R1
R1(config)#enable secret hello
R1(config)#interface g0/0/0
R1(config-if)#ip address 192.168.1.1 255.255.255.0
R1(config-if)#no shutdown

R1(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0/0, changed state to up

R1(config-if)#line vty 0 5
R1(config-line)#login
% Login disabled on line 2, until 'password' is set
% Login disabled on line 3, until 'password' is set
% Login disabled on line 4, until 'password' is set
% Login disabled on line 5, until 'password' is set
% Login disabled on line 6, until 'password' is set
% Login disabled on line 7, until 'password' is set
R1(config-line)#password pass
R1(config-line)#end
R1#
%SYS-5-CONFIG_I: Configured from console by console

R1#wr
Building configuration...
[OK]
R1#
```

PC


PC0
Physical
Config
Desktop
Programming
Command Prompt
X
Packet Tracer PC Command Line 1.0
C:\>ping 192.168.1.1
Pinging 192.168.1.1 with 32 bytes of data:
Reply from 192.168.1.1: bytes=32 time<1ms TTL=255
Reply from 192.168.1.1: bytes=32 time<1ms TTL=255
Reply from 192.168.1.1: bytes=32 time<1ms TTL=255
Reply from 192.168.1.1: bytes=32 time<1ms TTL=255
Ping statistics for 192.168.1.1:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms
C:\>telnet 192.168.1.1
Trying 192.168.1.1 ...Open
User Access Verification
Password:
R1>enable
Password:
R1#S
Top

iv. Observation

Q. Construct ~~TP~~ TELNET Protocol –



Steps –

① Drag PC and Router PT from the panel and connect both with copper cross wire

② Configure the IP address and gateway for PC1
Go to desktop → 192.168.1.2, 255.255.255.0,
Gateway - 192.168.1.1, DNS Server - 0.0.0.0

③ Configure the router in CLI –
Router>en
Router# conf t
Router(Config)# hostname R1
R1(Config)# enable secret cp
R1(Config)# int Fa0/0
R1(Config-if)# ip add 192.168.1.1 255.255.255.0
R1(Config-if)# no shut
R1(Config-if)# line vty 0 5
R1(Config-line)# login
% Login disabled on line 2, until password is set.
R1(Config-line)# password tp
R1(Config-line)# exit
R1# wr
Building configuration...
[OK]
R1#

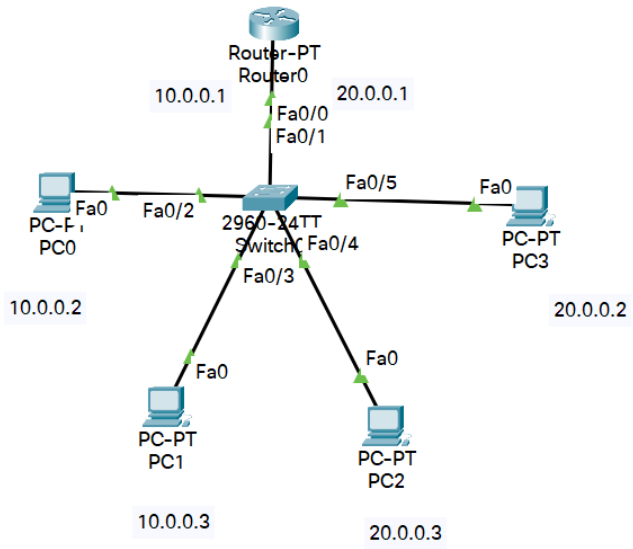
④ Go to PC Command prompt
C:\>ping 192.168.1.1
C:\>telnet 192.168.1.1
Trying 192.168.1.1 ... open
User Access Verification
Password:
R1>en
Password:
R1#tp
R1#cp
R1#

⑤ Now the password is set.

Program 11

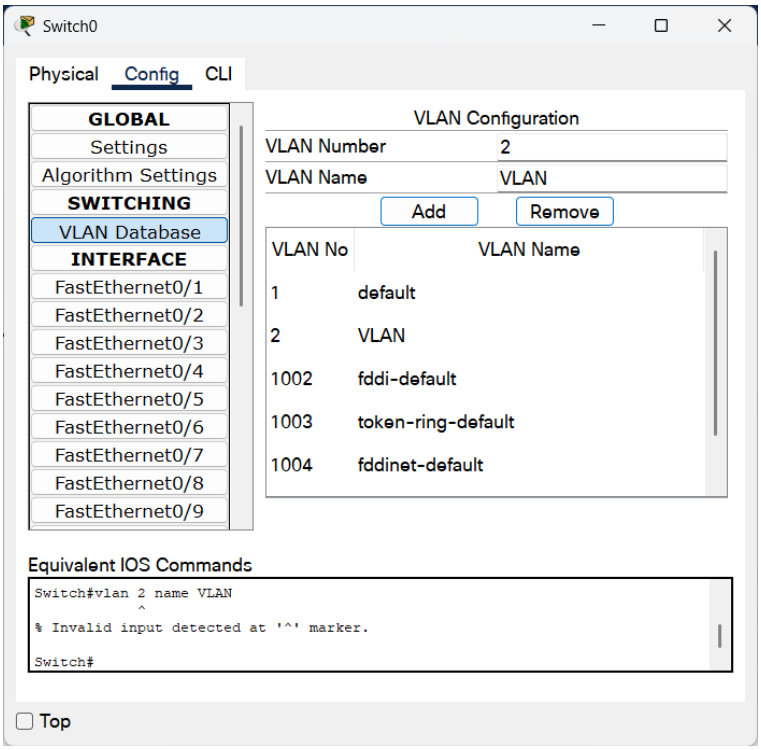
i. To construct a VLAN and make the PC's communicate among a VLAN

ii. Procedure along with the topology

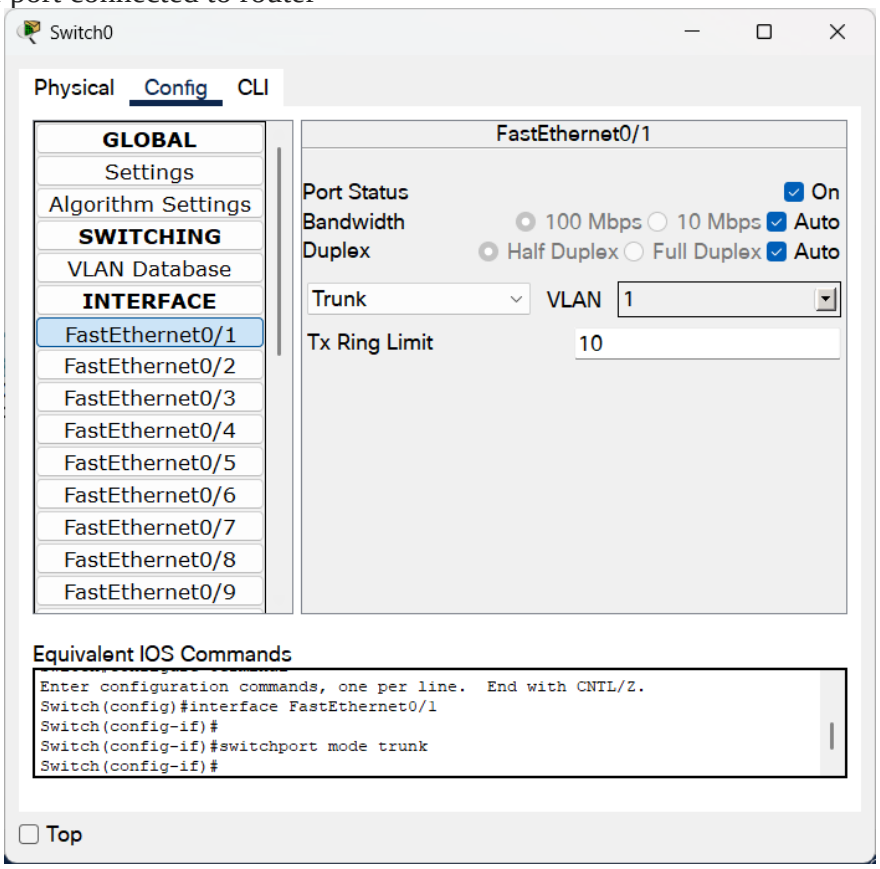


iii. Screen shots/ output

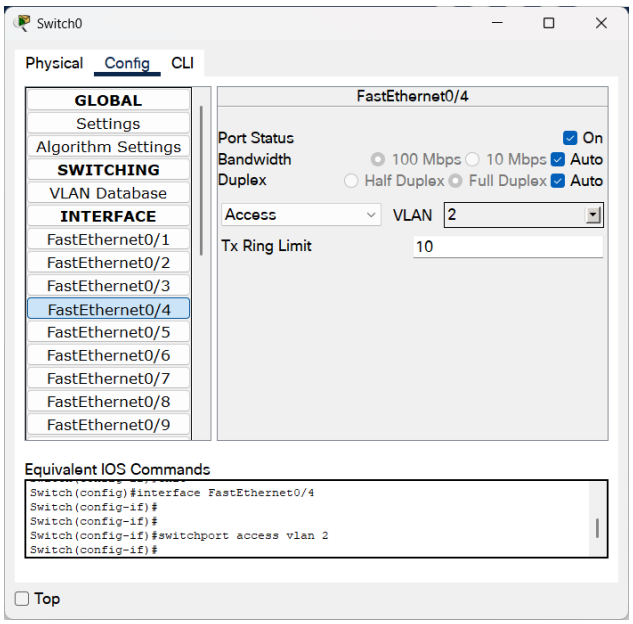
Switch Configuration

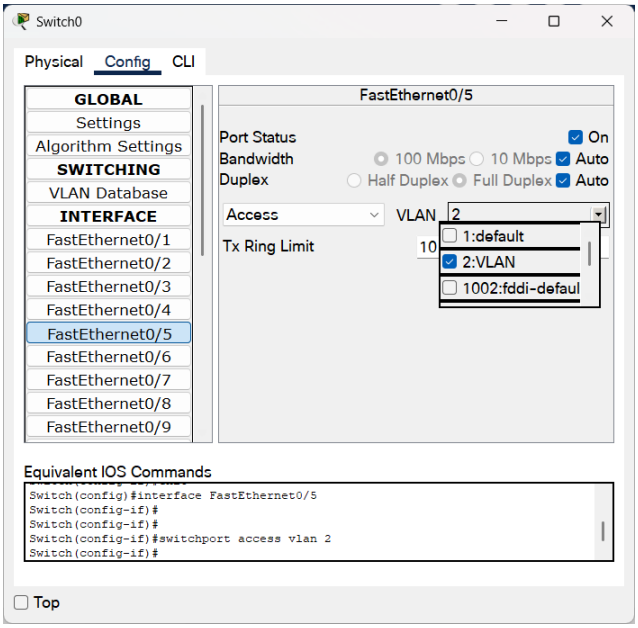


Configuration of port connected to router

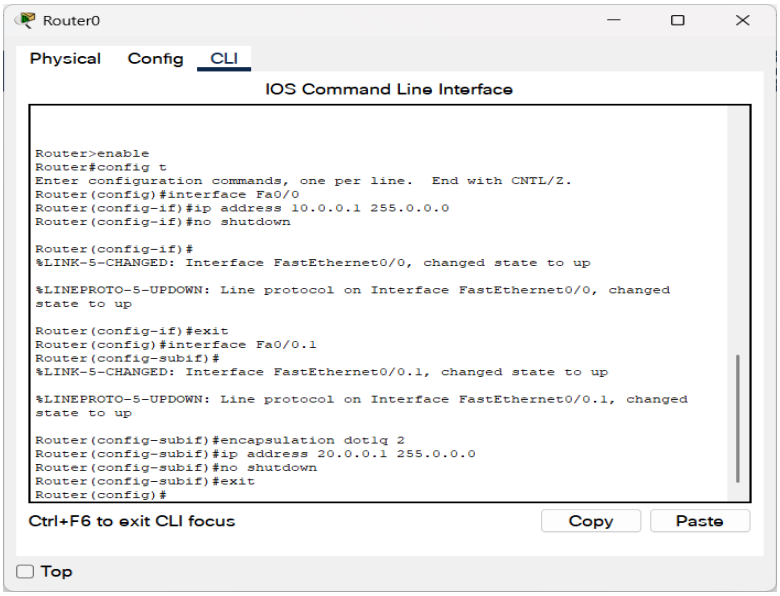


Configuration of ports connected to other networks

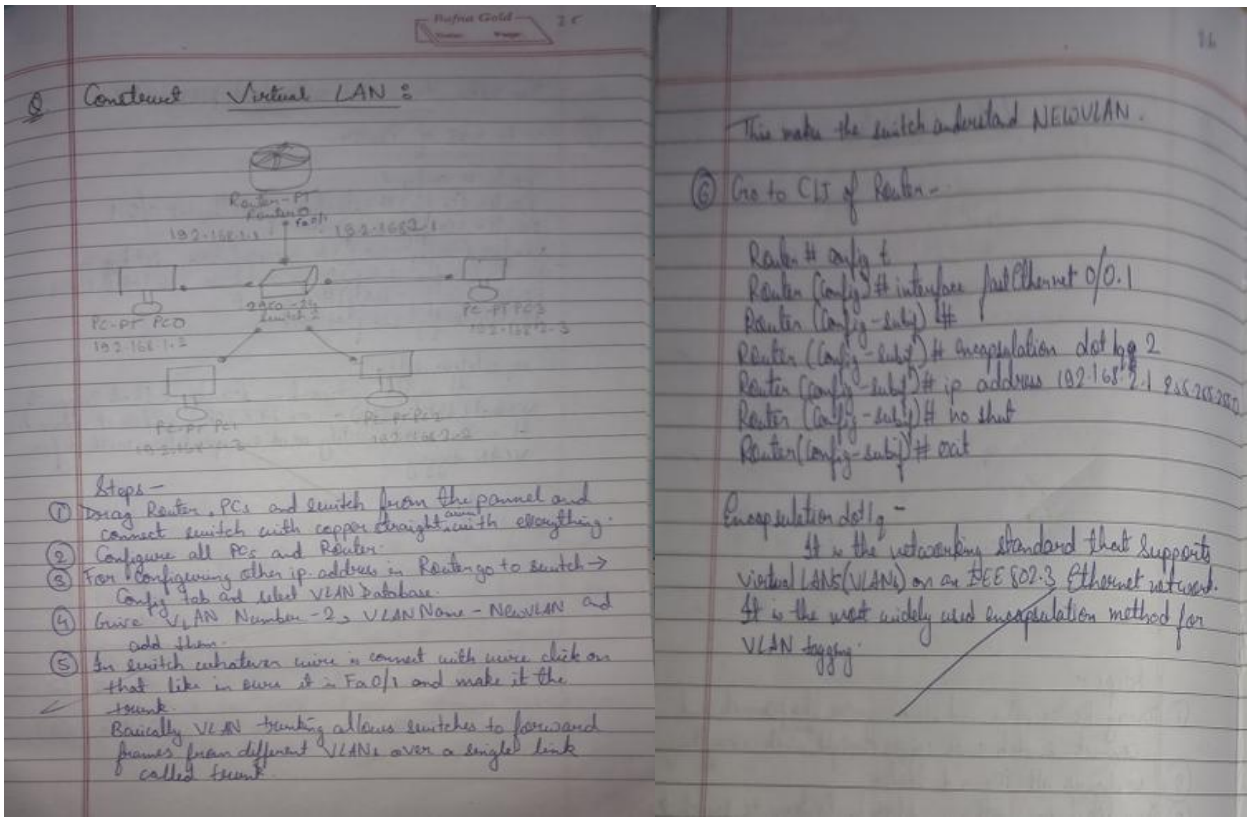




Configuartion of Router



iv. Observation



Q Construct Virtual LAN :

Steps –

1. Drag Router, PCs and switch from the pannel and connect switch with copper straight with everything.
2. Configure all PCs and Router.
3. For configuring other ip address in Router go to switch → Config tab and select VLAN Database.
4. Give VLAN Number – 2, VLAN Name – NewVLAN and add them.
5. In switch whatever wire is connect with wire click on that like in wire it is Fa0/1 and make it the trunk.

Basically VLAN trunking allows switches to forward frames from different VLANs over a single link called trunk.

This make the switch understand NEWVLAN.

6. Go to CLI of Router –

Router# config t
Router(config)# interface fastEthernet 0/0.1
Router(config-subif)#
Router(config-subif)# encapsulation dot1q 2
Router(config-subif)# ip address 192.168.2.1 255.255.255.0
Router(config-subif)# no shut
Router(config-subif)# exit

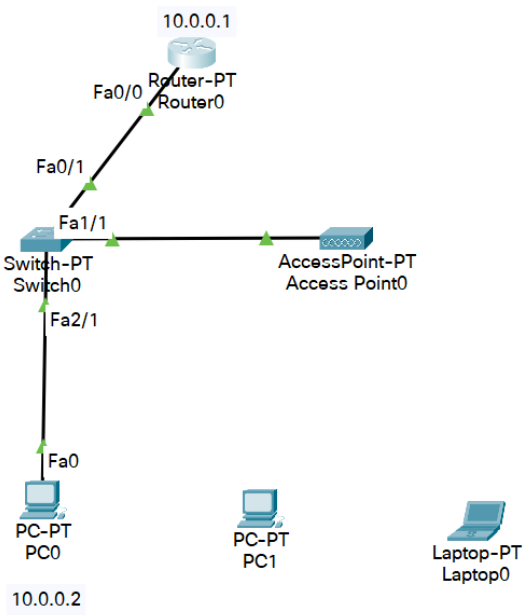
Encapsulation dot1q –

It is the networking standard that supports virtual LANs (VLANs) on an IEEE 802.3 Ethernet network. It is the most widely used encapsulation method for VLAN tagging.

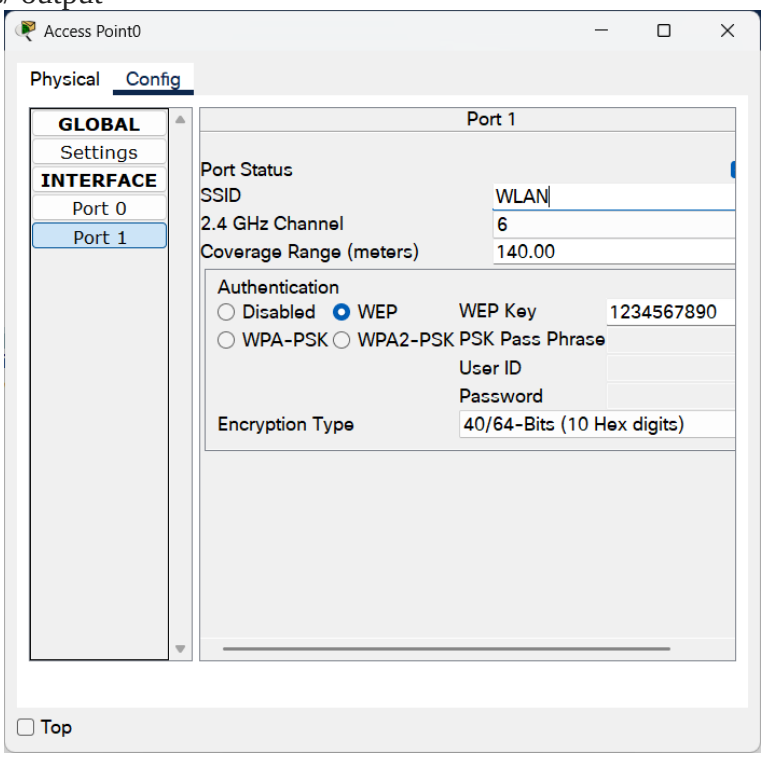
Program 12

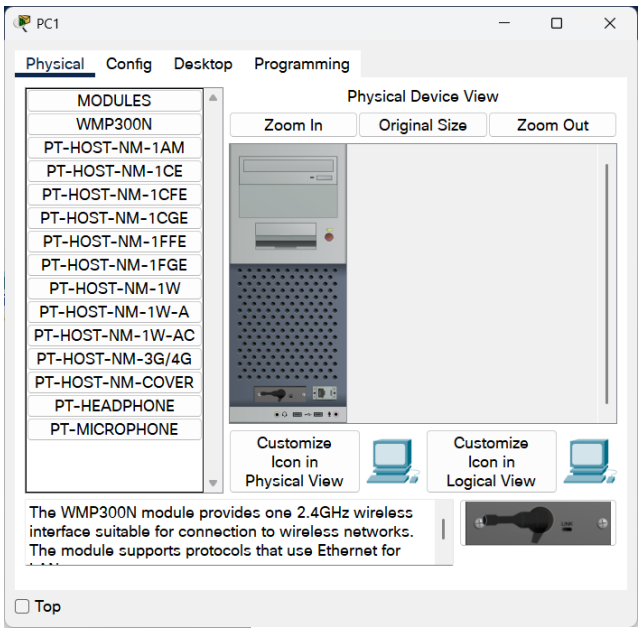
i. To construct a WLAN and make the nodes communicate wirelessly.

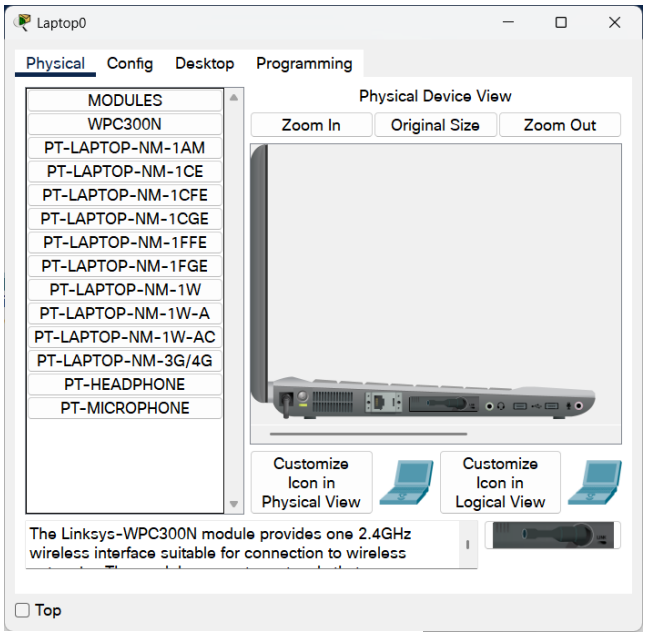
ii. Procedure along with the topology

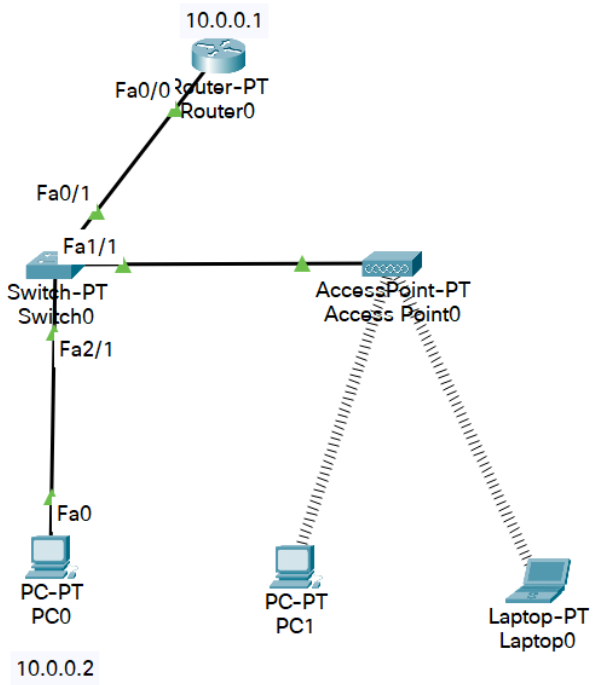


iii. Screen shots/ output

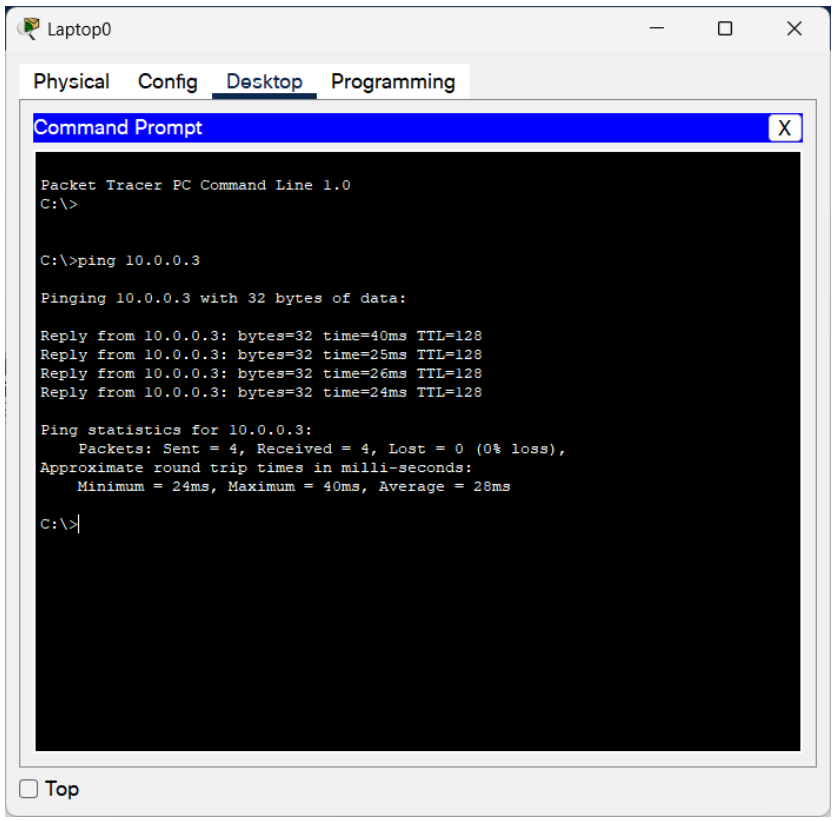



PC1
Physical
Config
Desktop
Programming
MODULES
WMP300N
PT-HOST-NM-1AM
PT-HOST-NM-1CE
PT-HOST-NM-1CFE
PT-HOST-NM-1CGE
PT-HOST-NM-1FFE
PT-HOST-NM-1FGE
PT-HOST-NM-1W
PT-HOST-NM-1W-A
PT-HOST-NM-1W-AC
PT-HOST-NM-3G/4G
PT-HOST-NM-COVER
PT-HEADPHONE
PT-MICROPHONE
Physical Device View
Zoom In
Original Size
Zoom Out
Customize Icon in Physical View
Customize Icon in Logical View
The WMP300N module provides one 2.4GHz wireless interface suitable for connection to wireless networks. The module supports protocols that use Ethernet for
Top

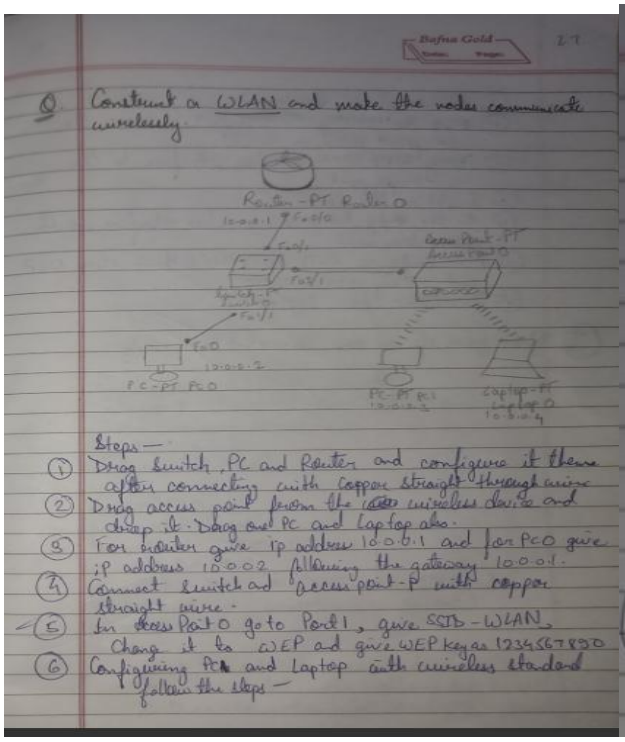

Laptop0
Physical
Config
Desktop
Programming
MODULES
WPC300N
PT-LAPTOP-NM-1AM
PT-LAPTOP-NM-1CE
PT-LAPTOP-NM-1CFE
PT-LAPTOP-NM-1CGE
PT-LAPTOP-NM-1FFE
PT-LAPTOP-NM-1FGE
PT-LAPTOP-NM-1W
PT-LAPTOP-NM-1W-A
PT-LAPTOP-NM-1W-AC
PT-LAPTOP-NM-3G/4G
PT-HEADPHONE
PT-MICROPHONE
Physical Device View
Zoom In
Original Size
Zoom Out
Customize Icon in Physical View
Customize Icon in Logical View
The Linksys-WPC300N module provides one 2.4GHz wireless interface suitable for connection to wireless
Top


10.0.0.1
Fa0/0
Router-PT
Router0
Fa0/1
Fa1/1
Switch-PT
Switch0
AccessPoint-PT
Access Point0
Fa2/1
Fa0
PC-PT
PC0
PC-PT
PC1
Laptop-PT
Laptop0
10.0.0.2

Ping:



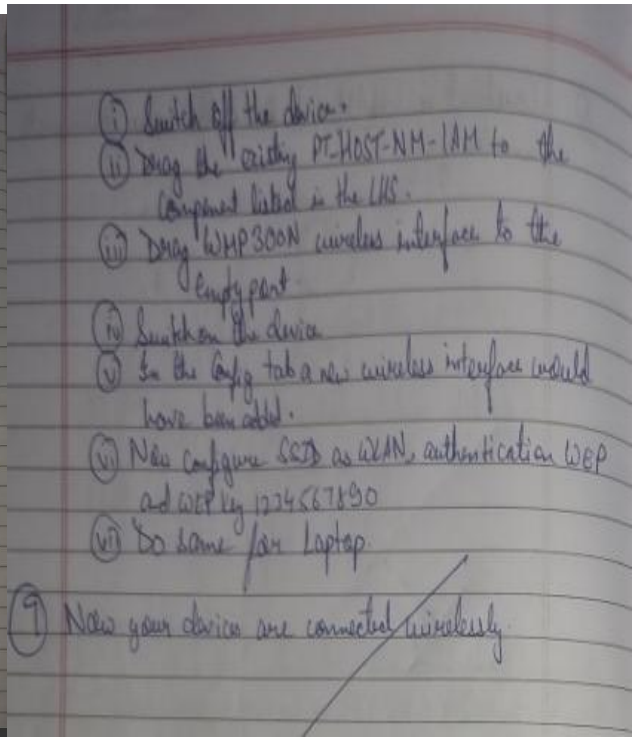
iv. Observation



Q Construct a WLAN and make the nodes communicate wirelessly.

Steps —

1. Drag Switch, PC and Router and configure it there after connecting with copper straight through wire
2. Drag access point from the wireless device and drop it. Drag one PC and Laptop also.
3. For router give IP address 10.0.0.1 and for PC0 give IP address 10.0.0.2 allowing the gateway 10.0.0.1.
4. Connect switch and access point-P with copper straight wire.
5. In Access Point 0 go to Port 1, give SSID - WLAN. Change it to WEP and give WEP Key as 1234567890
6. Configuring PC and Laptop with wireless standard follow the steps —



(i) Switch off the device.
(ii) Drag the existing PT-HOST-NM-1AM to the component listed in the LHS.
(iii) Drag WMP300N wireless interface to the empty port.
(iv) Switch on the device
(v) In the Config tab a new wireless interface would have been added.
(vi) Now configure SSID as WLAN, authentication WEP and WEP key 1234567890
(vii) Do same for Laptop

(9) Now your devices are connected wirelessly

Cycle-II

Program 1

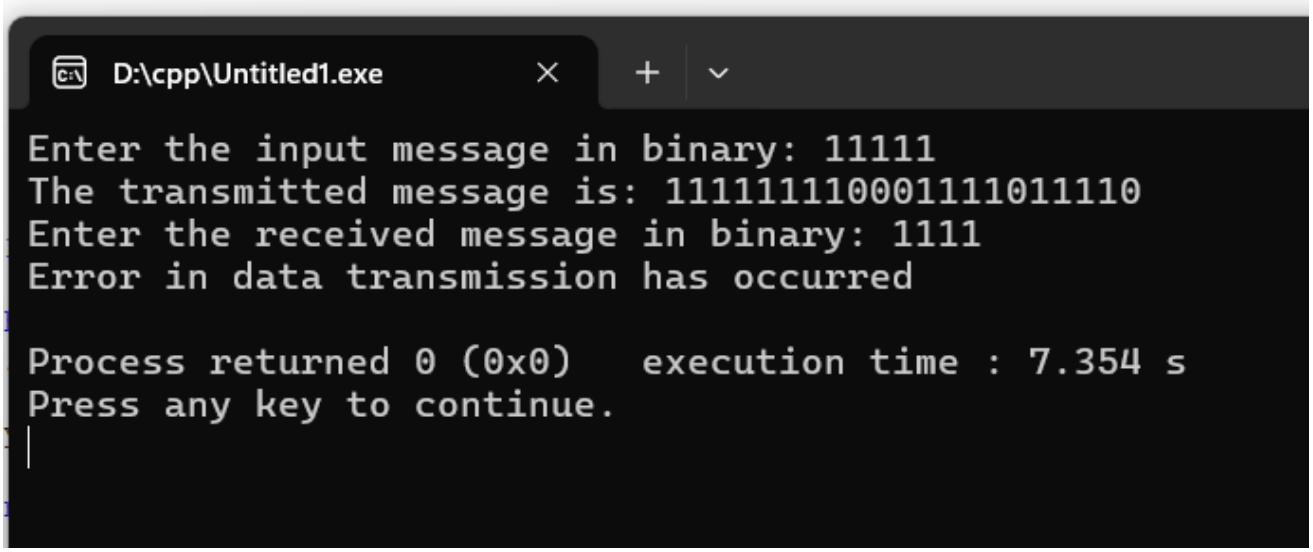
i. Write a program for error detecting code using CRC-CCITT (16-bits).

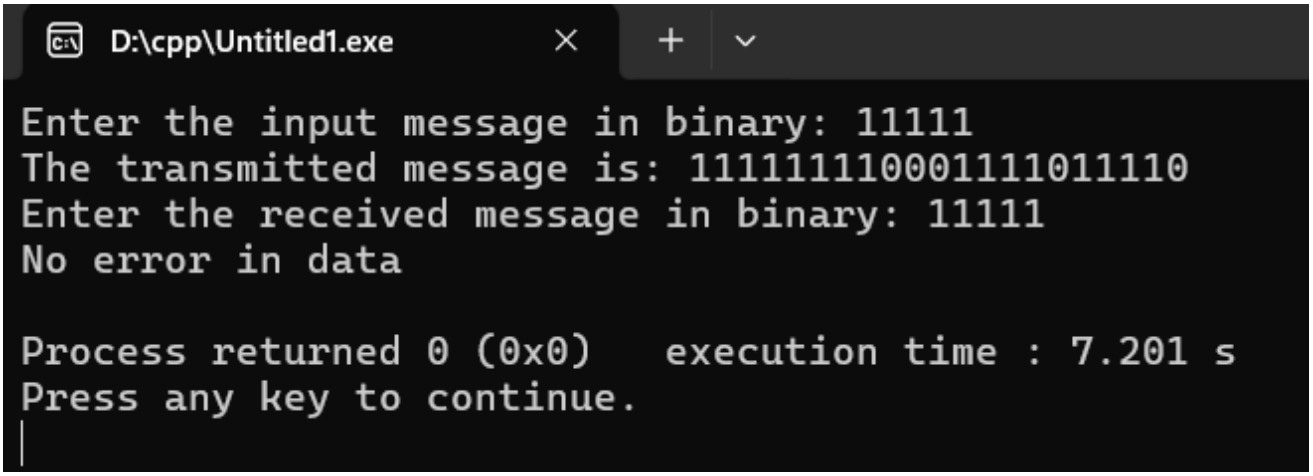
ii. Procedure

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

int crc(char *ip, char *op, char *poly, int mode) {
    strcpy(op, ip);

    if (mode) {
        for (int i = 1; i < strlen(poly); i++) {
            strcat(op, "0");
        }
    }

    // Perform XOR on the message with the selected polynomial
    for (int i = 0; i < strlen(ip); i++) {
        if (op[i] == '1') {
            for (int j = 0; j < strlen(poly); j++) {
                if (op[i + j] == poly[j])
                    op[i + j] = '0';
                else
                    op[i + j] = '1';
            }
        }
    }

    // Check for errors. Return 0 if error detected
    for (int i = 0; i < strlen(op); i++) {
        if (op[i] == '1')
            return 0;
    }

    return 1;
}

int main() {
    char ip[50], op[50], recv[50];
    char poly[] = "10001000000100001";

    printf("Enter the input message in binary: ");
    scanf("%s", ip);
```

```
    crc(ip, op, poly, 1);

    printf("The transmitted message is: %s%s\n", ip, op + strlen(ip));

    printf("Enter the received message in binary: ");
    scanf("%s", recv);

    if (crc(recv, op, poly, 0)) {
        printf("No error in data\n");
    } else {
        printf("Error in data transmission has occurred\n");
    }

    return 0;
}
```

iii. Screen shots/ output





iv. Observation

15/10/24

Task-7

Q Write a program for Error Detection using CRC-CCITT (16 bits)-

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

int crc (char* ip, char* op, char* poly, int mode){
    strcpy(op, ip); // Copy input to output
    if(mode) {
        // Append zeros to the output
        for (int i = 1; i < strlen(poly); i++) {
            strcat(op, "0");
        }
    }

    // Perform XOR on the message with the selected polynomial
    for (int i = 0; i < strlen(ip); i++){
        if (op[i] == '1'){
            for (int j = 0; j < strlen(poly); j++){
                if (op[i+j] == poly[j]){
                    op[i+j] = '0';
                } else {
                    op[i+j] = '1';
                }
            }
        }
    }

    // Check for errors. Return 0 if error detected
    for (int i = 0; i < strlen(op); i++){
        if (op[i] == '1') {
            return 0; // Error detected
        }
    }
    return 1; // No error
}
int main(){
    char ip[50], op[100], recv[50];
    char poly[] = "10001000000100001";
    printf("Enter the input message in binary:");
    scanf("%s", ip);
    // Calculate the CRC and get the transmitted message
    crc(ip, op, poly, 1);
    printf("The transmitted message is: %s\n", op);
    printf("Enter the received message in binary:");
    scanf("%s", recv);
    // Check received message for errors
    if (crc(recv, op, poly, 0)){
        printf("No errors in data\n");
    } else {
        printf("Error in data transmission has occured\n");
    }
    return 0;
}
```

Output-

(1) Enter the input message in binary: 11111
The transmitted message is: 00000111000111101 11110
Enter the received message in binary: 11111
Error in data transmission has occured.

(2) Enter the input message in binary: 11111
The transmitted message is: 00000111000111101 11110
Enter the received message in binary: 11111
No errors in data

Program 2

i. Write a program for congestion control using Leaky bucket algorithm

ii. Procedure

```
#include <stdio.h>

int main() {
    int no_of_queries, storage, output_pkt_size;
    int input_pkt_size, bucket_size, size_left;
    storage = 0;
    no_of_queries = 4;
    bucket_size = 10;
    input_pkt_size = 4;
    output_pkt_size = 1;

    for (int i = 0; i < no_of_queries; i++) {
        size_left = bucket_size - storage;

        if (input_pkt_size <= size_left) {
            // Update storage
            storage += input_pkt_size;
        } else {
            printf("Packet loss = %d\n", input_pkt_size);
        }

        printf("Buffer size = %d out of bucket size = %d\n",
               storage, bucket_size);

        // Packets leaving the bucket
        storage -= output_pkt_size;

        // Ensure storage doesn't go negative
        if (storage < 0) {
            storage = 0;
        }
    }

    return 0;
}
```

iii. Screen shots/ output

```
D:\cpp\Untitled1.exe

Buffer size = 4 out of bucket size = 10
Buffer size = 7 out of bucket size = 10
Buffer size = 10 out of bucket size = 10
Packet loss = 4
Buffer size = 9 out of bucket size = 10

Process returned 0 (0x0)   execution time : 0.059 s
Press any key to continue.
```

iv. Observation

Q. Write a program for leaky bucket algorithm.

```
#include <stdio.h>
int main(){
    int no_of_queries, storage, output_pkt_size;
    int input_pkt_size, bucket_size, size_left;
    storage=0;
    no_of_queries=4;
    bucket_size=10;
    input_pkt_size=4;
    output_pkt_size=1;
    for(int i=0; i< no_of_queries ;i++){
        size_left = bucket_size - storage;
        if(input_pkt_size <= size_left){
            storage += input_pkt_size;
        }else{
            printf("Packet loss= %d\n", input_pkt_size);
        }
        printf("Buffer size = %d out of bucket size=%d
                \n", storage, bucket_size);
        storage -= output_pkt_size;
    }
    return 0;
}
```

Output-

Buffer size = 4 out of bucket size = 10
Buffer size = 7 out of bucket size = 10
Buffer size = 10 out of bucket size = 10
Packet loss = 4
Buffer size = 9 out of bucket size = 10

Program 3

i. Using TCP/IP sockets, write a client-server program to make client sending the file name and the server to send back the contents of the requested file if present.

ii. Procedure

clientTCP.py

```
from socket import *
serverName = '127.0.0.1'
serverPort = 12000
clientSocket = socket(AF_INET, SOCK_STREAM)
clientSocket.connect((serverName,serverPort))
sentence = input("\nEnter file name: ")

clientSocket.send(sentence.encode())
filecontents = clientSocket.recv(1024).decode()
print ('\nFrom Server:\n')
print(filecontents)
clientSocket.close()
```

serverTCP.py

```
from socket import *
serverName="127.0.0.1"
serverPort = 12000
serverSocket = socket(AF_INET,SOCK_STREAM)
serverSocket.bind((serverName,serverPort))
serverSocket.listen(1)
while 1:
    print ("The server is ready to receive")
    connectionSocket, addr = serverSocket.accept()
    sentence = connectionSocket.recv(1024).decode()

    file=open(sentence,"r")
    l=file.read(1024)

    connectionSocket.send(l.encode())
    print ('\nSent contents of ' + sentence)
    file.close()
    connectionSocket.close()
```

iii. Screen shots/ output

Client

```
IDLE Shell 3.12.6
File  Edit  Shell  Debug  Options  Window  Help
Python 3.12.6 (tags/v3.12.6:a4a2d2b, Sep  6 2024, 20:11:23) [MSC v.1940 64 bit (
AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
=========== RESTART: E:\Engineering\5Sem\CN\Experiments\clientTCP.py ===========

Enter file name: serverTCP.py

From Server:

from socket import *
serverName="127.0.0.1"
serverPort = 12000
serverSocket = socket(AF_INET,SOCK_STREAM)
serverSocket.bind((serverName,serverPort))
serverSocket.listen(1)
while 1:
    print ("The server is ready to receive")
    connectionSocket, addr = serverSocket.accept()
    sentence = connectionSocket.recv(1024).decode()

    file=open(sentence,"r")
    l=file.read(1024)

    connectionSocket.send(l.encode())
    print ('\nSent contents of ' + sentence)
    file.close()
    connectionSocket.close()

>>>
```

Server

```
*IDLE Shell 3.12.6*
File  Edit  Shell  Debug  Options  Window  Help
Python 3.12.6 (tags/v3.12.6:a4a2d2b, Sep  6 2024, 20:11:23) [MSC v.1940 64 bit (
AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
=========== RESTART: E:\Engineering\5Sem\CN\Experiments\serverTCP.py ===========
The server is ready to receive

Sent contents of serverTCP.py
The server is ready to receive
```

iv. Observation

Q. Write Python Program for Socket Programming –

(1) Using TCP/IP sockets, write a client-server program to make client sending the file name and the server to send back the contents of the requested file if present.

⇒ ClientTCP.py –

```
from socket import*
serverName = '127.0.0.1'
serverPort = 12000
clientSocket = socket(AF_INET, SOCK_STREAM)
clientSocket.connect((serverName, serverPort))
sentence = input("\nEnter file name:")
clientSocket.send(sentence.encode())
fileContents = clientSocket.recv(1024).decode()
print("\nFrom Server:\n")
print(fileContents)
clientSocket.close()
```

ServerTCP.py –

```
from socket import*
serverName = "127.0.0.1"
serverPort = 12000
serverSocket = socket(AF_INET, SOCK_STREAM)
serverSocket.bind((serverName, serverPort))
serverSocket.listen(1)
while 1:
    print("The server is ready to receive")
    connectionSocket, addr = serverSocket.accept()
    sentence = connectionSocket.recv(1024).decode()
```

30

```
file = open(sentence,"r")
l = file.read(1024)
connectionSocket.send(l.encode())
print("\n Sent contents of" + sentence)
file.close()
connectionSocket.close()
```

Program 4

i. Using UDP sockets, write a client-server program to make client sending the file name and the server to send back the contents of the requested file if present.

ii. Procedure

clientUDP.py

```
from socket import *
serverName = "127.0.0.1"
serverPort = 12000
clientSocket = socket(AF_INET, SOCK_DGRAM)

sentence = input("\nEnter file name:  ")

clientSocket.sendto(bytes(sentence,"utf-8"),(serverName, serverPort))

filecontents,serverAddress = clientSocket.recvfrom(2048)
print ('\nReply from Server:\n')
print (filecontents.decode("utf-8"))
# for i in filecontents:
   # print(str(i), end = '')
clientSocket.close()
clientSocket.close()
```

serverUDP.py

```
from socket import *
serverPort = 12000
serverSocket = socket(AF_INET, SOCK_DGRAM)
serverSocket.bind(("127.0.0.1", serverPort))
print ("The server is ready to receive")
while 1:
    sentence, clientAddress = serverSocket.recvfrom(2048)
    sentence = sentence.decode("utf-8")
    file=open(sentence,"r")
    con=file.read(2048)

    serverSocket.sendto(bytes(con,"utf-8"),clientAddress)

    print ('\nSent contents of ', end = ' ')
    print (sentence)
   #  for i in sentence:
```

```
    #  print (str(i), end = '')
  file.close()
```

iii. Screen shots/ output

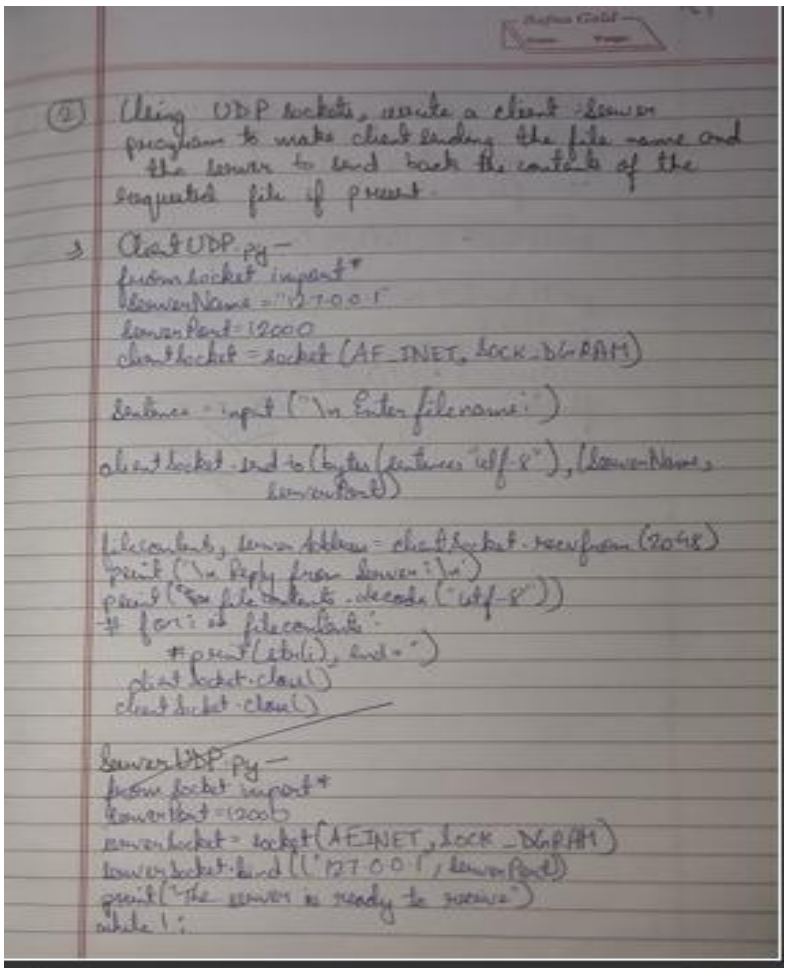
Client

```
IDLE Shell 3.12.6
File  Edit  Shell  Debug  Options  Window  Help
Python 3.12.6 (tags/v3.12.6:a4a2d2b, Sep  6 2024, 20:11:23) [MSC v.1940 64 bit (
AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
= RESTART: E:\Engineering\5Sem\CN\Experiments\clientUDP.py

Enter file name:  serverUDP.py

Reply from Server:

from socket import *
serverPort = 12000
serverSocket = socket(AF_INET, SOCK_DGRAM)
serverSocket.bind(("127.0.0.1", serverPort))
print ("The server is ready to receive")
while 1:
     sentence, clientAddress = serverSocket.recvfrom(2048)
     sentence = sentence.decode("utf-8")
     file=open(sentence,"r")
     con=file.read(2048)

     serverSocket.sendto(bytes(con,"utf-8"),clientAddress)

     print ('\nSent contents of ', end = ' ')
     print (sentence)
    #  for i in sentence:
        #  print (str(i), end = '')
     file.close()
```

Server

```
*IDLE Shell 3.12.6*
File  Edit  Shell  Debug  Options  Window  Help
Python 3.12.6 (tags/v3.12.6:a4a2d2b, Sep  6 2024, 20:11:23) [MSC v.1940 64 bit (
AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
= RESTART: E:\Engineering\5Sem\CN\Experiments\serverUDP.py
The server is ready to receive

Sent contents of  serverUDP.py
```

iv. Observation



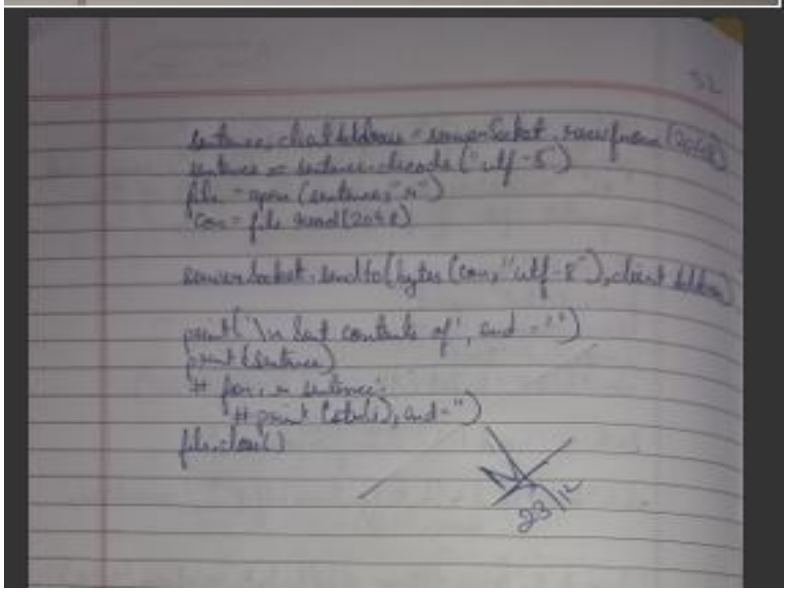
(4) Using UDP sockets, write a client-server program to make client sending the file name and the server to send back the contents of the requested file if present.

→ ClientUDP.py –

```
from socket import*
serverName = "127.0.0.1"
serverPort = 12000
clientSocket = socket (AF_INET, SOCK_DGRAM)

sentence = input ("\n Enter filename:")

clientSocket.sendto(bytes(sentence, "utf-8"), (serverName,
                serverPort))

fileContents, serverAddress = clientSocket.recvfrom(2048)
print ("\n Reply from server:\n")
print(fileContents.decode("utf-8"))
# for i in fileContents:
    # print(str(i), end="")
clientSocket.close()
clientSocket.close()
```

ServerUDP.py –

```
from socket import*
serverPort = 12000
serverSocket = socket(AF_INET, SOCK_DGRAM)
serverSocket.bind(("127.0.0.1", serverPort))
print("The server is ready to receive")
while 1:
```



```
sentence, clientAddress = serverSocket.recvfrom(2048)
sentence = sentence.decode("utf-8")
file = open(sentence,"r")
con = file.read(2048)

serverSocket.sendto(bytes(con,"utf-8"),clientAddress)

print("\n Sent contents of", end=" ")
print(sentence)
# for i in sentence:
    # print(str(i), end="")
file.close()
```