VISVESVARAYA TECHNOLOGICAL UNIVERSITY

"JnanaSangama", Belgaum -590014, Karnataka.

LAB REPORT
on

COMPUTER NETWORKS

Submitted by

UDAY S (1BM22CS420)

in partial fulfillment 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
JUN-2023 to SEP-2023

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 NETWORKS" carried out by **UDAY S (1BM22CS420),** who is a bonafide student of **B. M. S. College of Engineering.** It is in partial fulfillment for the award of **Bachelor of Engineering in Computer Science and Engineering** of the Visvesvaraya Technological University, Belgaum during the year 2023. The Lab report has been approved as it satisfies the academic requirements in respect of a **Computer Networks - (22CS4PCCON)** work prescribed for the said degree.

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BMSCE, Bengaluru

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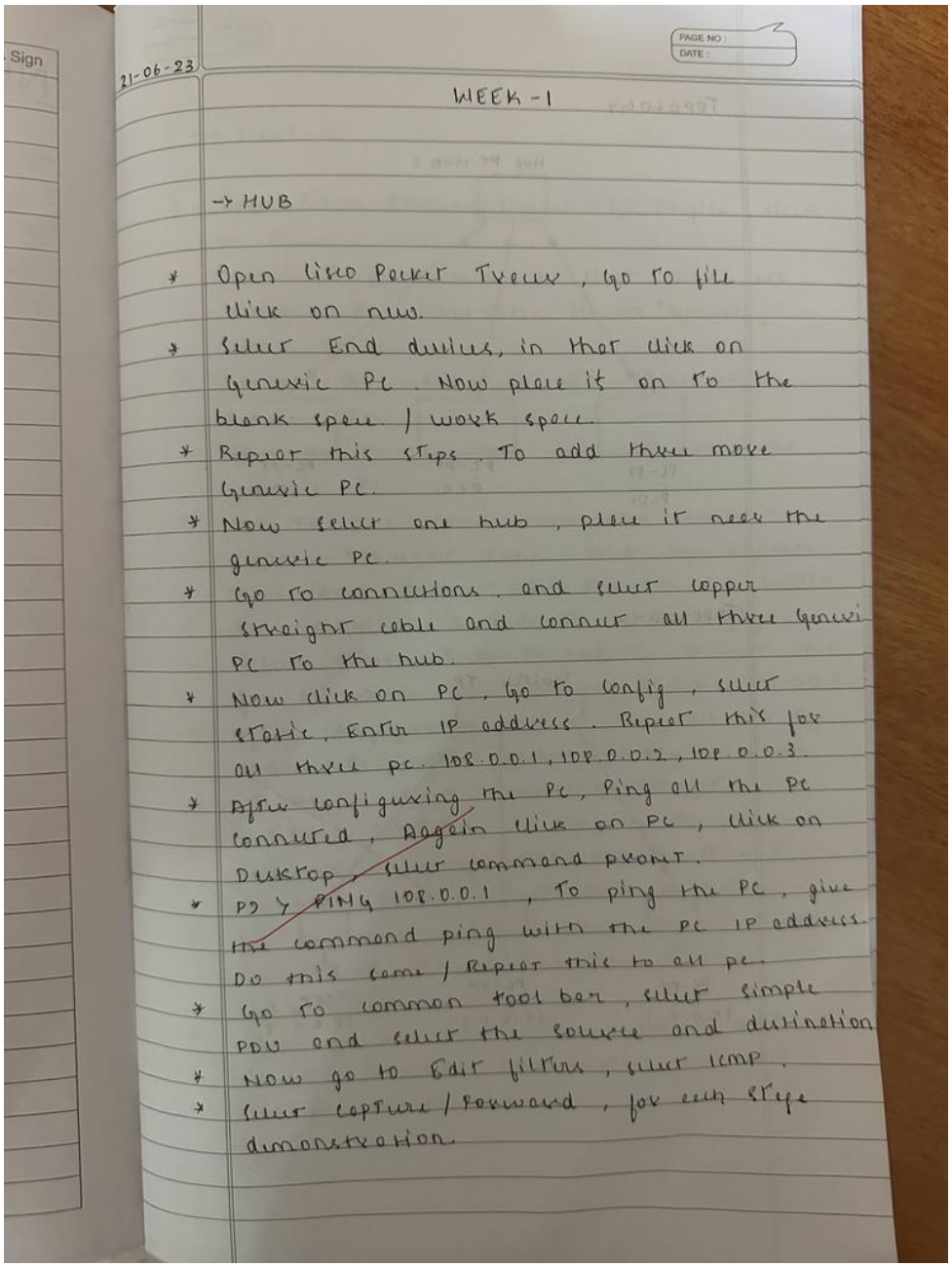
WEEK 1

Create a topology and simulate sending a simple PDU from source to destination using hub and switch as connecting devices and demonstrate ping messages.

OBSERVATION:



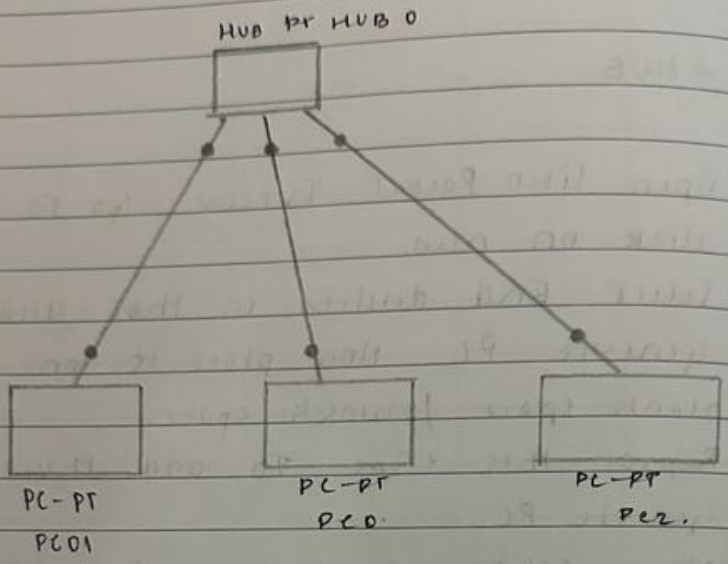
21-06-23

WEEK-1

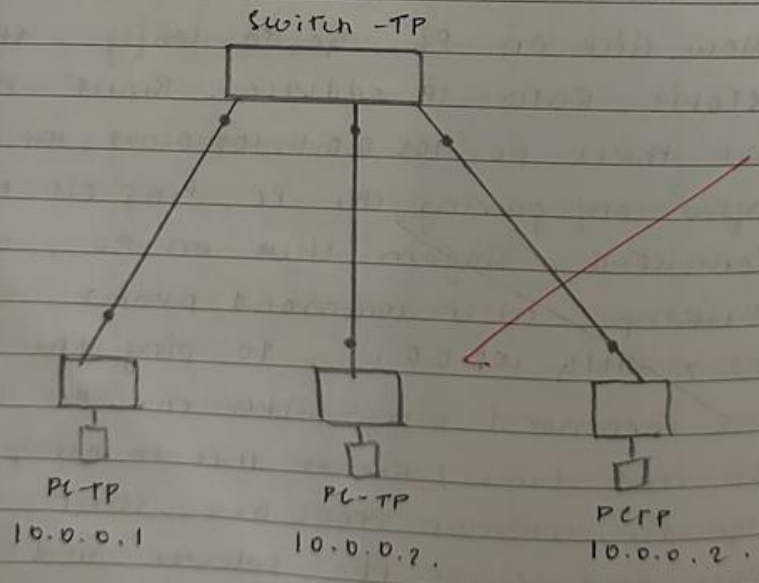
-> HUB

* Open Cisco Packet Tracer, go to file click on new.
* Select End devices, in that click on Generic PC. Now place it on to the blank space / work space.
* Repeat this steps. To add three more Generic PC.
* Now select one hub, place it near the generic PC.
* Go to connections, and select copper straight cable and connect all three Generic PC to the hub.
* Now click on PC, go to config, select static, Enter IP address. Repeat this for all three pc. 108.0.0.1, 108.0.0.2, 108.0.0.3.
* After configuring the PC, Ping all the PC connected, Again click on PC, click on Desktop, select command prompt.
* PC > PING 108.0.0.1, To ping the PC, give the command ping with the PC IP address. Do this same / Repeat this to all pc.
* Go to common tool bar, select simple PDU and select the source and destination
* Now go to Edit filters, select ICMP.
* Select capture / Forward, for each steps demonstration.

TOPOLOGY.



TOPOLOGY.



→ SWITCH

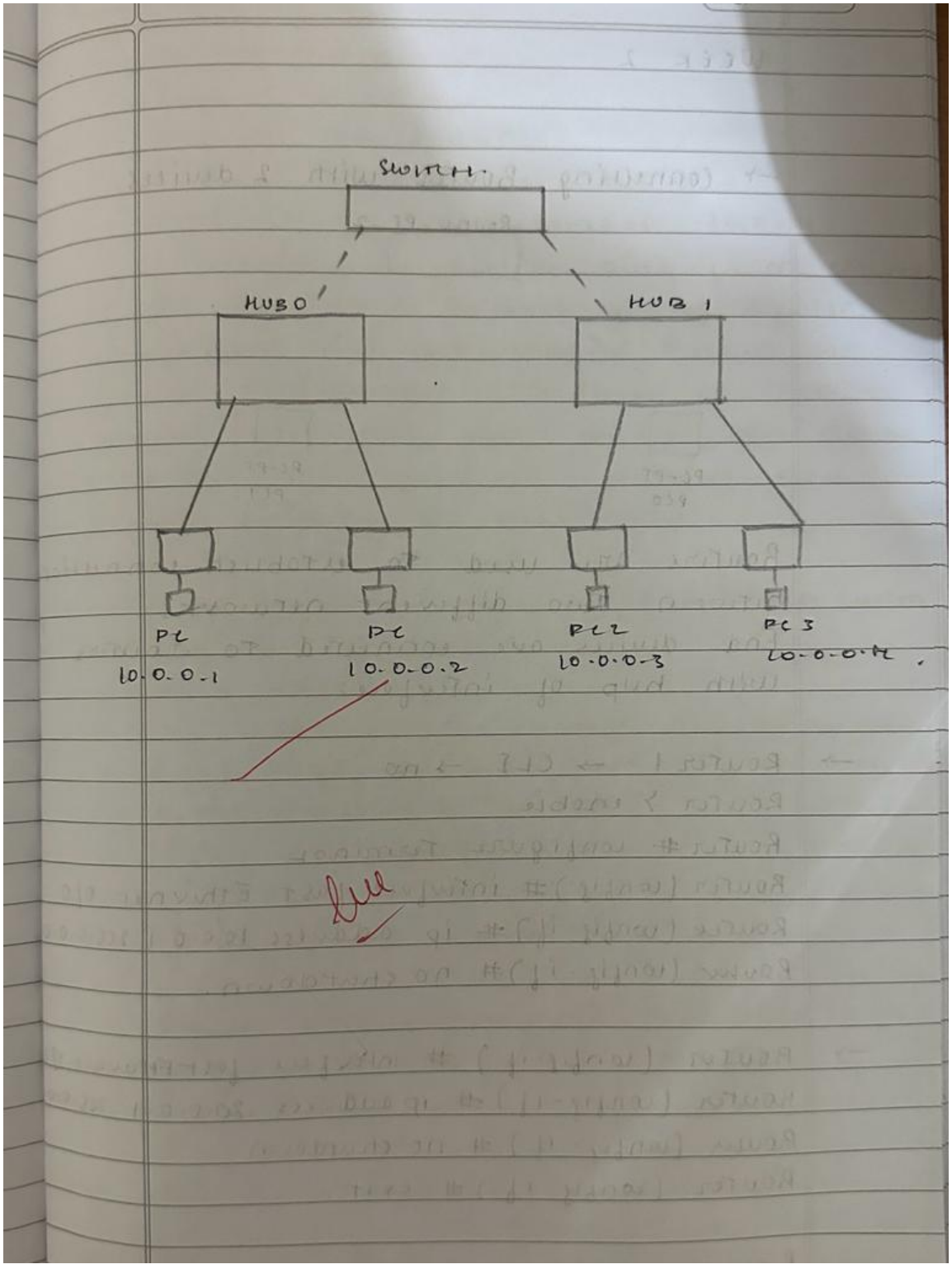
* Open Cisco Packet Tracer, Go to file, click on new.
* Select End devices, in that click on Generic PC. Now place it on "Generic" work space.
* Repeat this steps, To add three more generic PC.
* Now select one hub, place it near the generic PC.
* Go to the connections, and select copper straight cable and copper cross over and connect all the pc and switch.
* Now click on Generic PC, Go To config, select static, Enter IP address, Repeat this for all three PC. 109.0.0.1, 109.0.0.2, 109.0.0.3
* After configuring the PC, ping all the PC connected, again click on PC, click on desktop, select command prompt.
* PC> PING 109.0.0.1, To ping the PC, give the command ping with the PC IP address Do this same / Repeat this to all pc.
* Go to common tool box, select simple PDU and select the source and distination.
* Now go to Edit filters, select ICMP
* Select capture / Forward, for each stage demonstration.

→ Connecting two hubs with a switch.

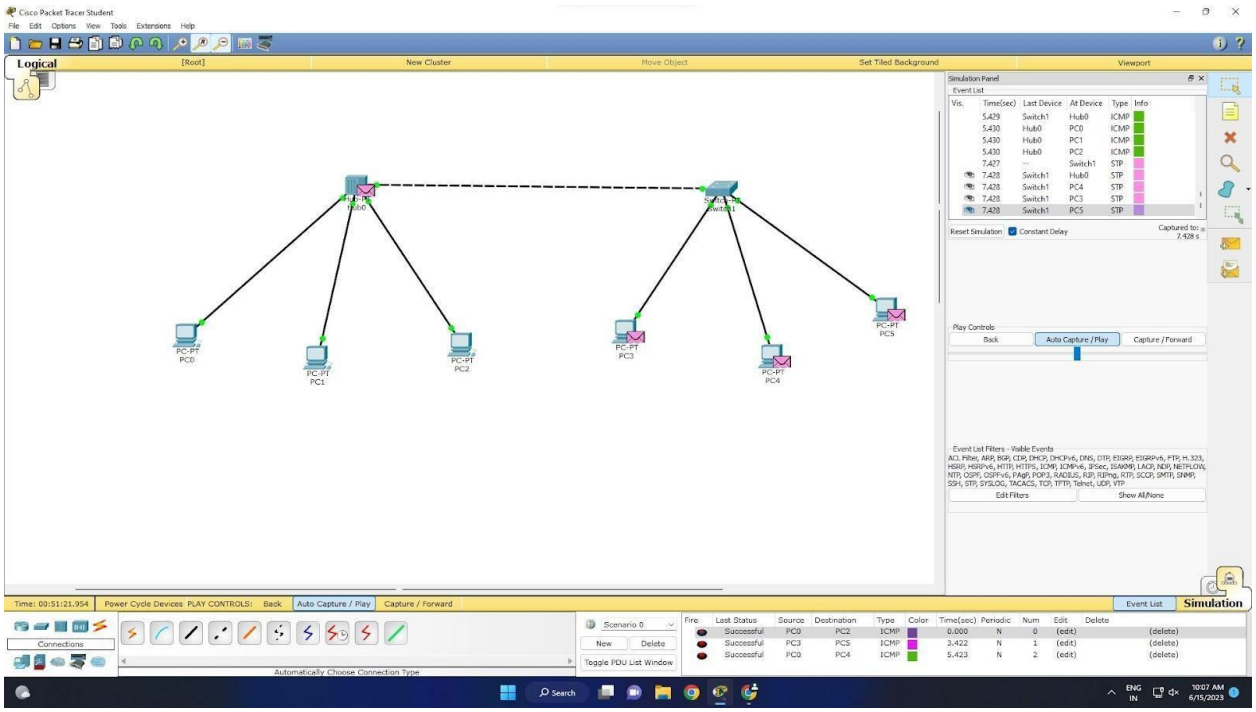
* Double click on the cisco packet tracer icon.
* Build the network on the workspace.
* Click on the end connection, select the required number of generic computer to build hub network.
* Give the IP address to each, Repeat this for all three 3 pc, 109.0.0.1, 109.0.0.2.
* After configuring the pc, ping all the pc connected, again click on Pc, click on desktop, select command prompt
* PC > PING 109.0.0.1, to ping the pc give command pc IP address. Do this same to all pc.

Transfer between PC0 → PC3

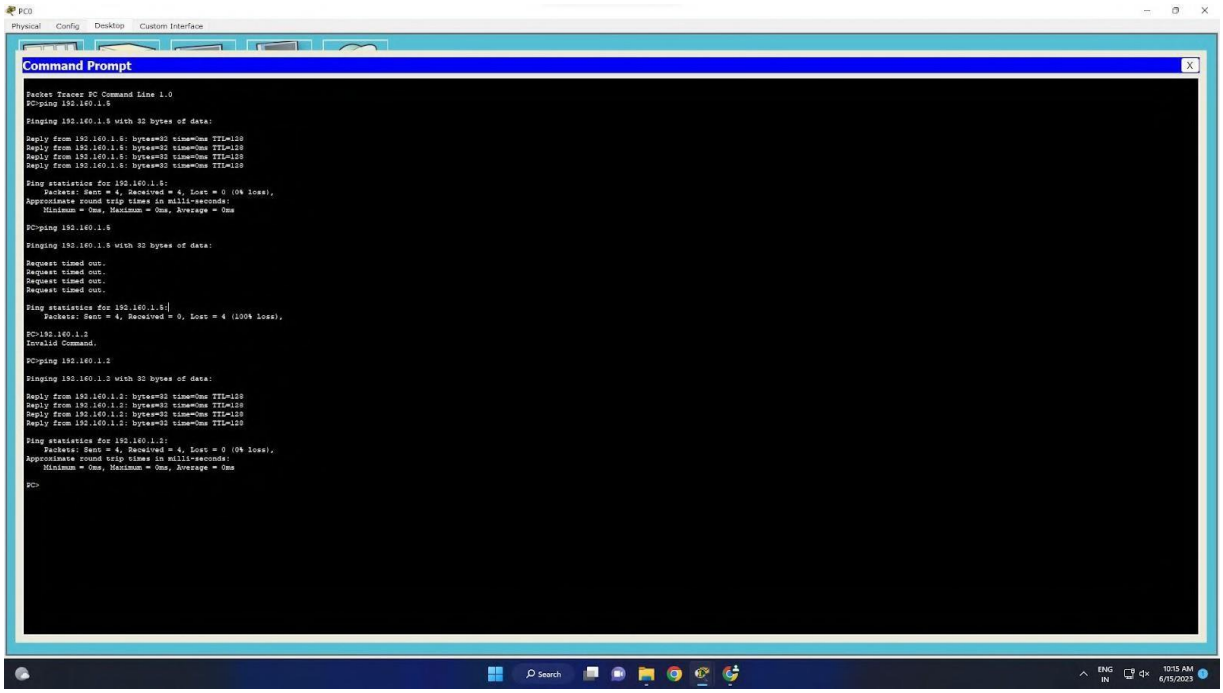
PC0 → hub0
hub0 → pc0 & switch
PC1 discards.
switch → hub1
hub1 → PC2 & PC3
PC2 discards, PC3 sends act → hub1
hub1 → pc1 & switch.
switch1 → hub0
hub0 → pc0 & pc1

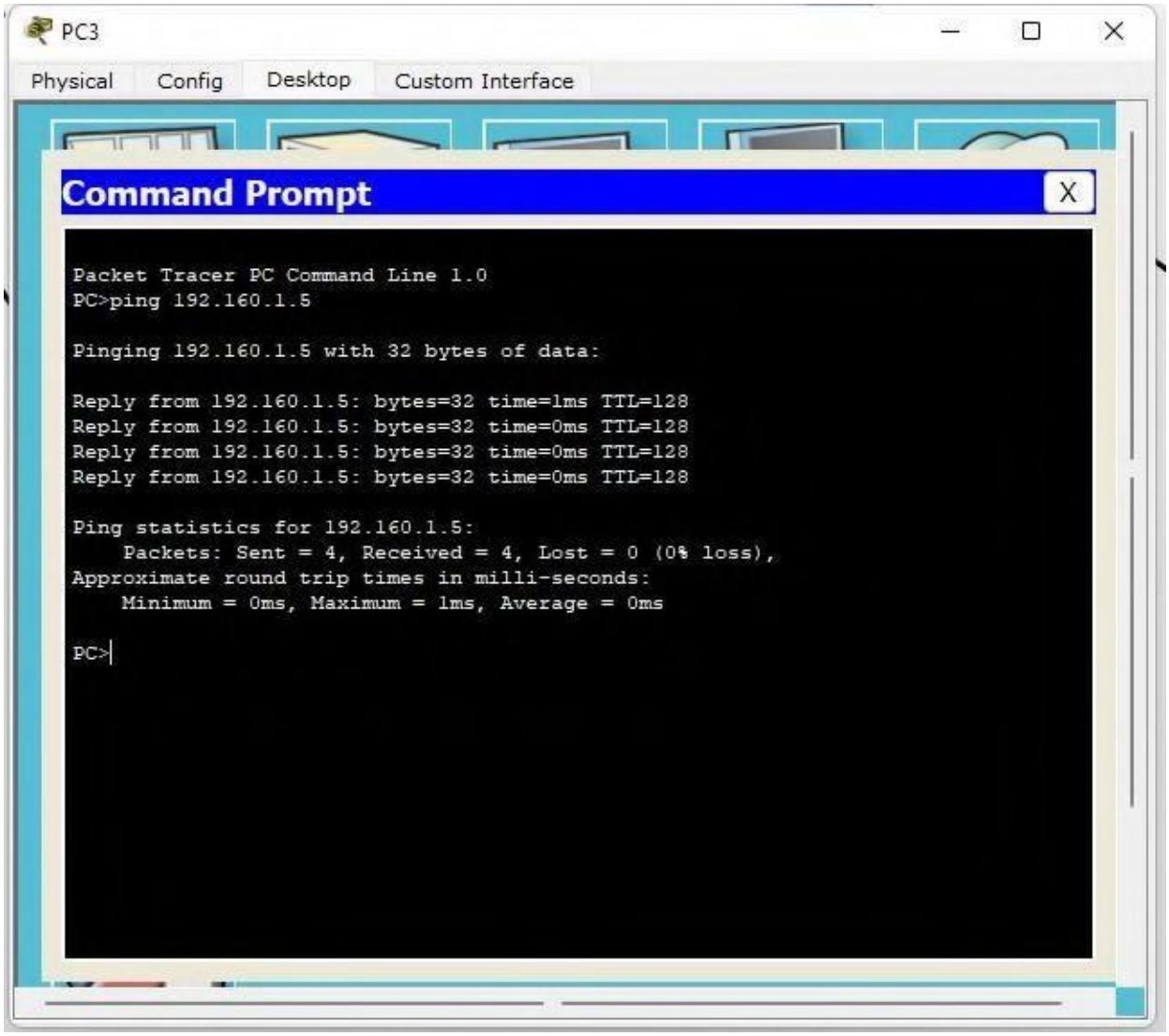

SWITCH
HUB 0
HUB 1
PC
10.0.0.1
PC
10.0.0.2
PC 2
10.0.0.3
PC 3
10.0.0.4

TOPOLOGY:



OUTPUT:

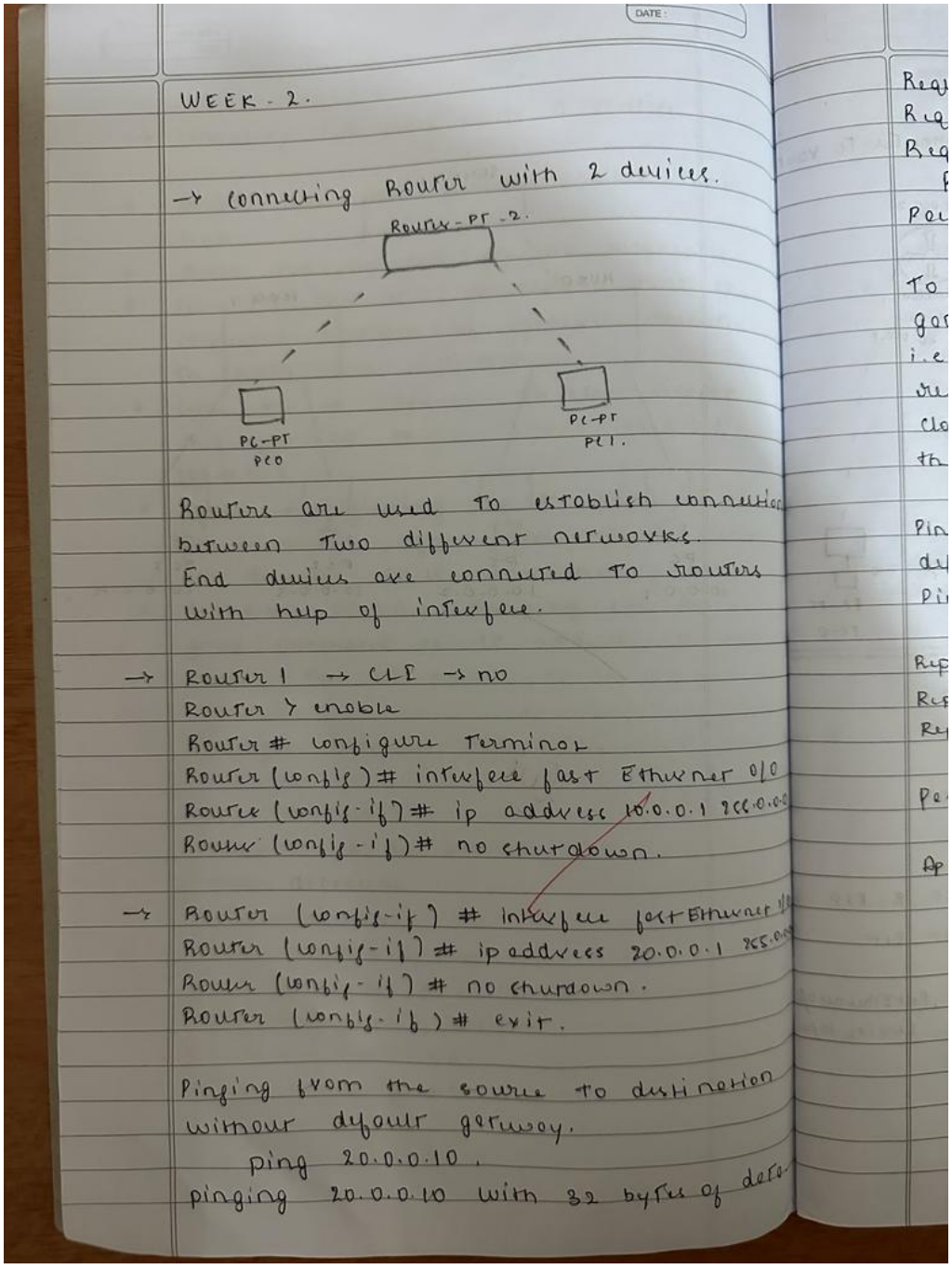



PC3
Physical
Config
Desktop
Custom Interface
Command Prompt
X
Packet Tracer PC Command Line 1.0
PC>ping 192.160.1.5
Pinging 192.160.1.5 with 32 bytes of data:
Reply from 192.160.1.5: bytes=32 time=1ms TTL=128
Reply from 192.160.1.5: bytes=32 time=0ms TTL=128
Reply from 192.160.1.5: bytes=32 time=0ms TTL=128
Reply from 192.160.1.5: bytes=32 time=0ms TTL=128
Ping statistics for 192.160.1.5:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 1ms, Average = 0ms
PC>

WEEK 2

Configure IP address to routers (one and three) in packet tracer. Explore the following messages: ping responses, destination unreachable, request timed out, reply.

OBSERVATION:



Request timed out.
Request timed out.
Request timed out.
Ping statistics for 20.0.0.10.
Packets sent = 4 Received = 0 lost = 4.

When we try to ping from source to destination without giving default gateway we get request turned out i.e packets are sent back are not received are lost because the routers does not know the path to send the packet to destination.

Pinging from source to destination with default gateway.
Ping 20.10.0.10.

Pinging 20.0.0.10 with 32 bytes of data.
Reply from 20.0.0.10 bytes = 32 time = 0ms TTL
Reply from 20.0.0.10 bytes = 32 time = 0ms
Reply from 20.0.0.10 bytes = 0 ms TTL = 127.

Packet sent = 4 Received = 4 lost = 0

Approximate round trip time in ms.
Min = 0ms Max = 0ms Avg = 0ms.

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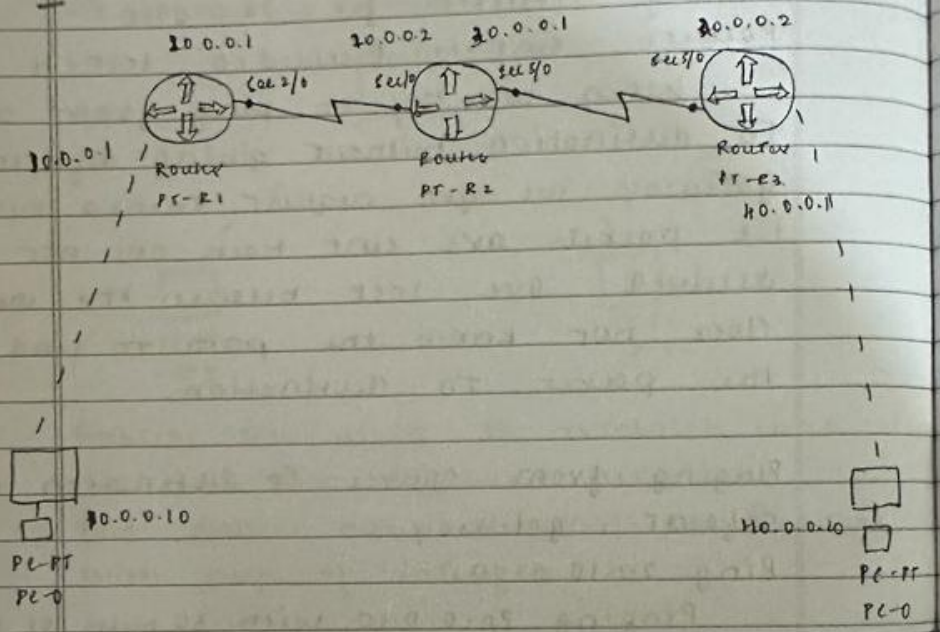
DATE

WEEK 3

→ Configure default route, static routes to route



RESPONSE

Code 1.

* Enable.
* show ip route.

Codes : C - connected, S - static, I - IGRP, R - RIP

Gateway of last resort is not set

C 10.0.0.0/8 is directly connected, FastEthernet0/0
C 20.0.0.0/8 is directly connected, Serial 2/0
S 30.0.0.0/8 [1/0] via 20.0.0.2

PROCEDURE

* Connect 3 Routers and 2 PC's using cross over cable for the PC to router and a serial DCE cable to connect router to router.
* Set the IP address of both PC's and respective gateway number.
* For all 3 Routers set the respective 2 IP address in CLI mode by using these commands.

→ Click on router R1, then type IP Route 30.0.0.0 255.0.0.0 30.0.0.2.

→ Click on router R2, then type IP Route 30.0.0.0 255.0.0.0 40.0.0.1.

Router PT-1.

Router > enable
Router # configure terminal
Router (config) # interface fastEthernet 0/0
Router (config-if) # ip address 10.0.0.1 255.0.0.0
Router (config-if) # no shutdown
Router (config-if) # exit
Router (config) # interface fastEthernet 0/0 serial 2/0
Router (config) # ip address 20.0.0.1 255.0.0.0
Router (config-if) # no shutdown.
exit.

Router PT-2.

Router > enable.
Router # configure terminal
Router (config) # interface serial 2/0
Router (config-if) # ipaddress 20.0.0.2 255.0.0.0
Router (config-if) # no shutdown.
Router (config-if) # exit.
Router (config) # interface serial 3/0
Router (config-if) # ip address 20.0.01 255.0.0.0
Router (config-if) # no shutdown.

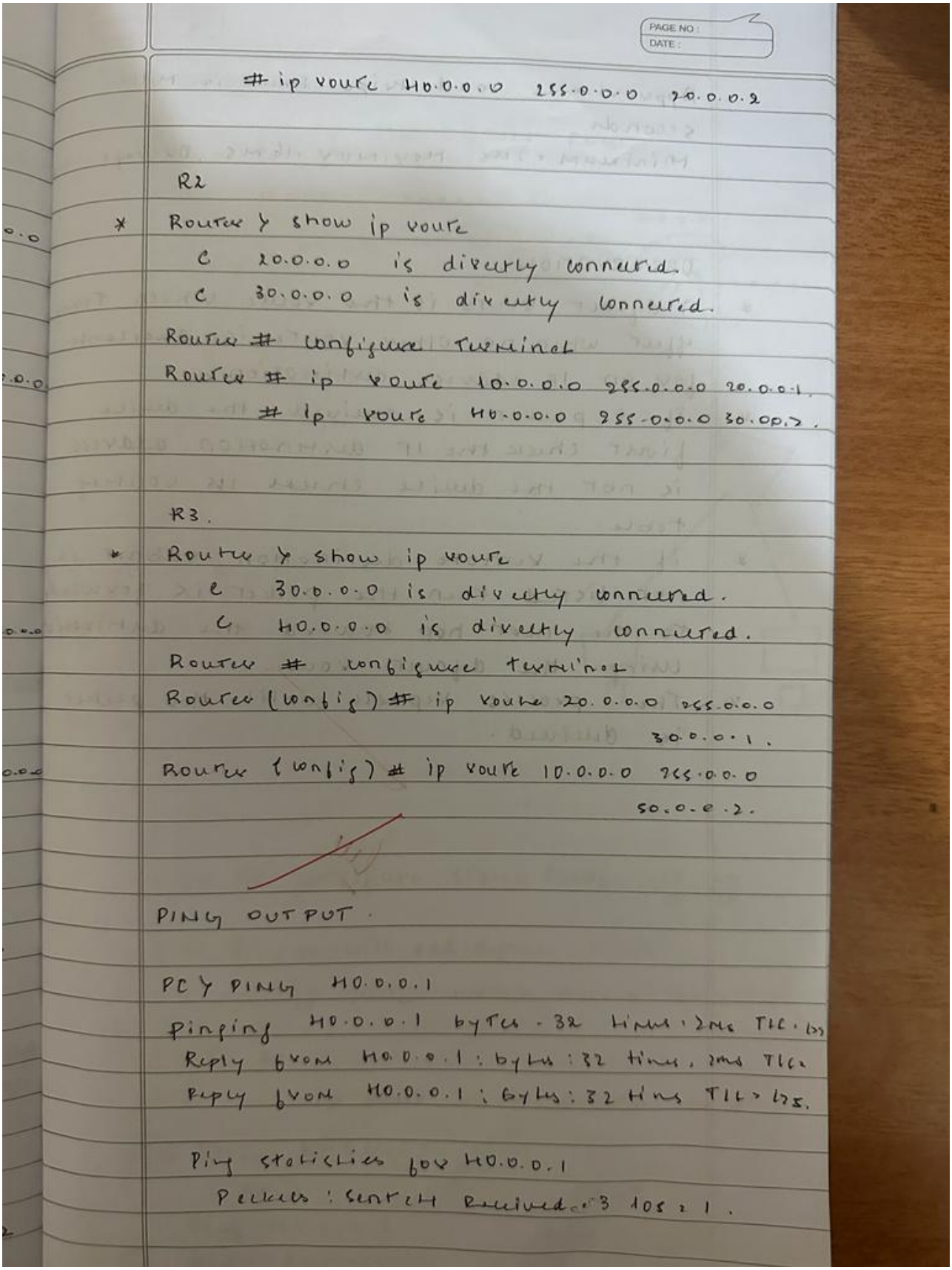
Router PT-3.

Router > enable.
Router # configure terminal
Router (config) # interface serial 2/0
Router (config-if) # ip address 30.0.0.2 255.0.0.0
Router (config-if) # no shutdown
Router (config if) # exit.
Router (config) # interface serial 2/0
Router (config) # ip address 40.0.0.1 255.0.0.0
Router (config-if) # no shutdown.

For Router 1. set the IP route of other IP address statically by using following steps.

R1

* Router > show ip route
C 10.0.0.0 is directly connected
C 20.0.0.0 is directly connected.
Router > Enable
Router # configure terminal.
ip route 30.0.0.0 255.0.0.0 20.0.0.2



ip route 40.0.0.0 255.0.0.0 20.0.0.2

R2

* Router > show ip route
  C 20.0.0.0 is directly connected.
  C 30.0.0.0 is directly connected.

Router # configure terminal
Router # ip route 10.0.0.0 255.0.0.0 20.0.0.1.
ip route 40.0.0.0 255.0.0.0 30.0p.>.

R3.

* Router > show ip route
  C 30.0.0.0 is directly connected.
  C 40.0.0.0 is directly connected.

Router # configure terminal
Router (config) # ip route 20.0.0.0 255.0.0.0
30.0.0.1.
Router (config) # ip route 10.0.0.0 255.0.0.0
50.0.0.2.

PING OUTPUT.

PC > PING 40.0.0.1

Pinging 40.0.0.1 byte - 32 time : 2ms TTL : 63
Reply from 40.0.0.1 : bytes : 32 time, 2ms TTL
Reply from 40.0.0.1 : Bytes : 32 time TTL > 125.

Ping statistics for 40.0.0.1
Packets : Sent = 4 Received = 3 lost = 1.

TOPOLOGY:

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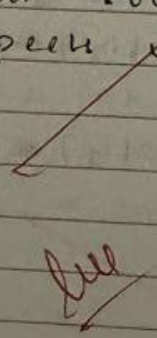
Approximate round trip times in milli seconds

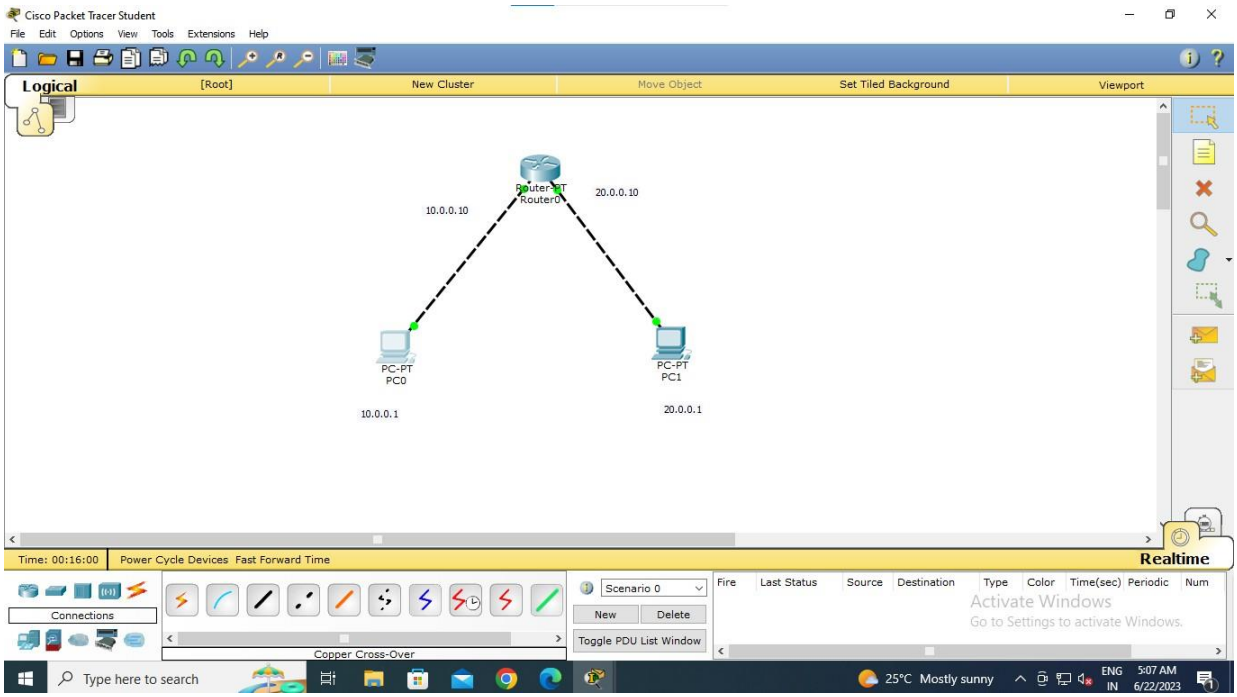
Minimum = 2ms, Maximum = 16 ms, Average = 6ms

OBSERVATION.

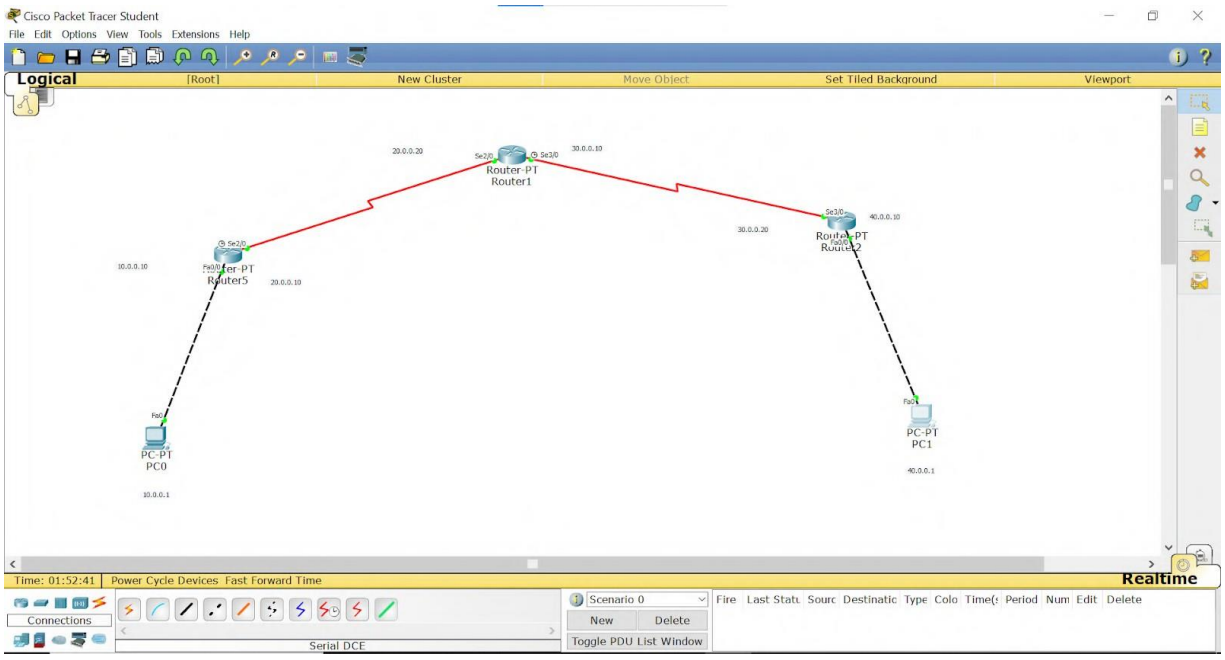
* A default route is the route which takes effect when no other route is available for an IP address destination.
* If a packet is received, the device first check the IP destination address is not the device checks its routing table.
* if the remote destination subnet is not listed then the packet is forwarded to the next hop toward the destination using the default route.
* The process repeats until the packet is delivered.



PROGRAM 2.1

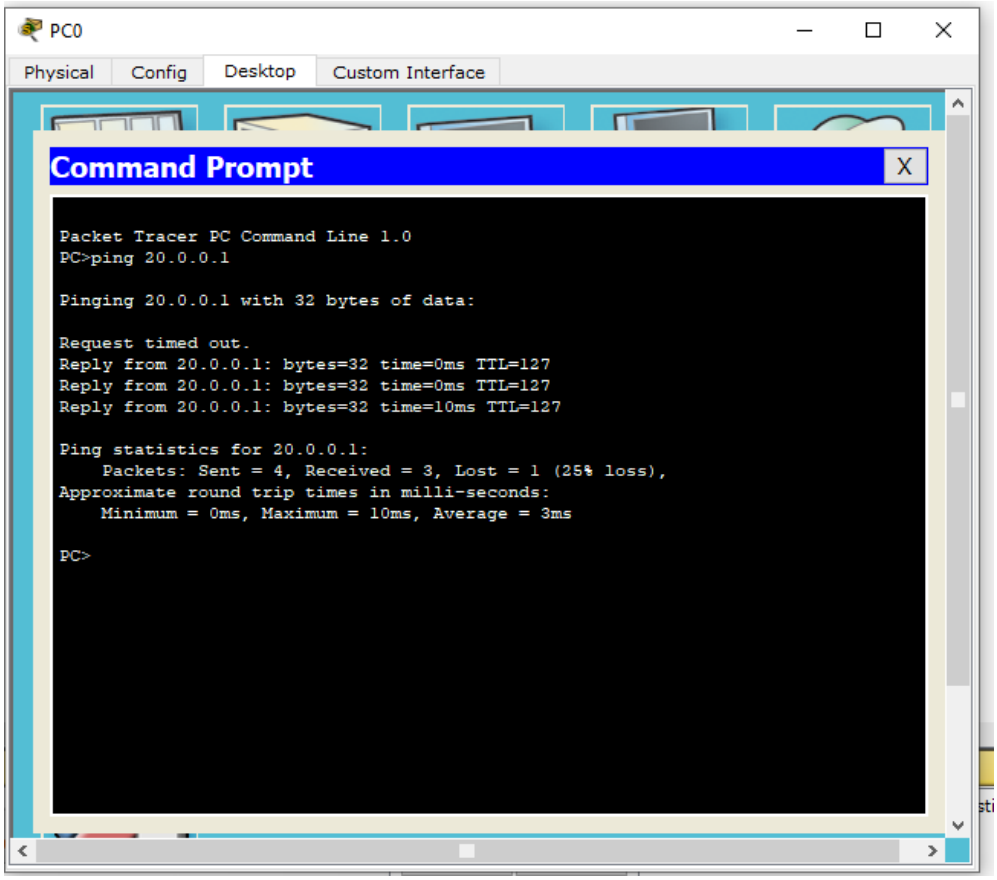


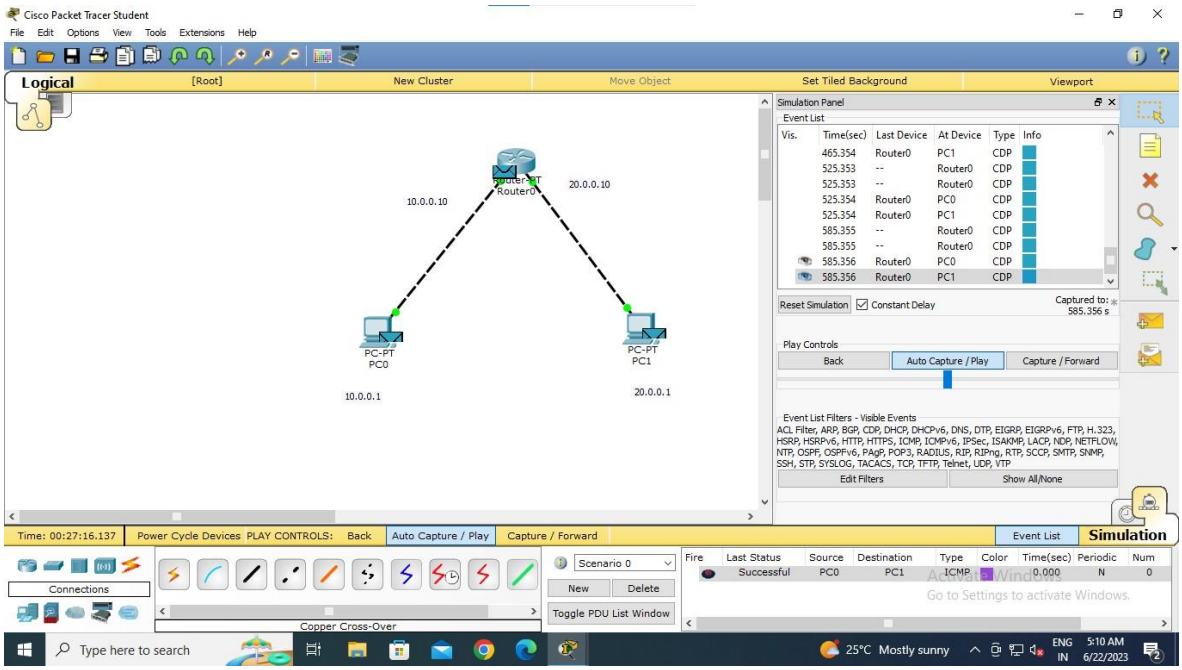
PROGRAM 2.2



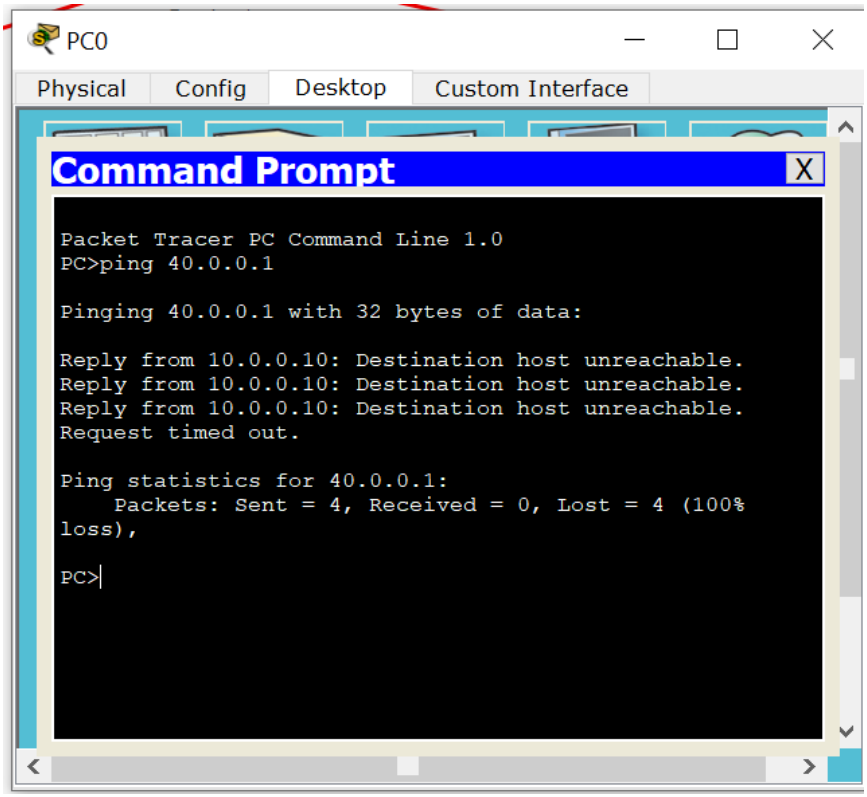
OUTPUT:

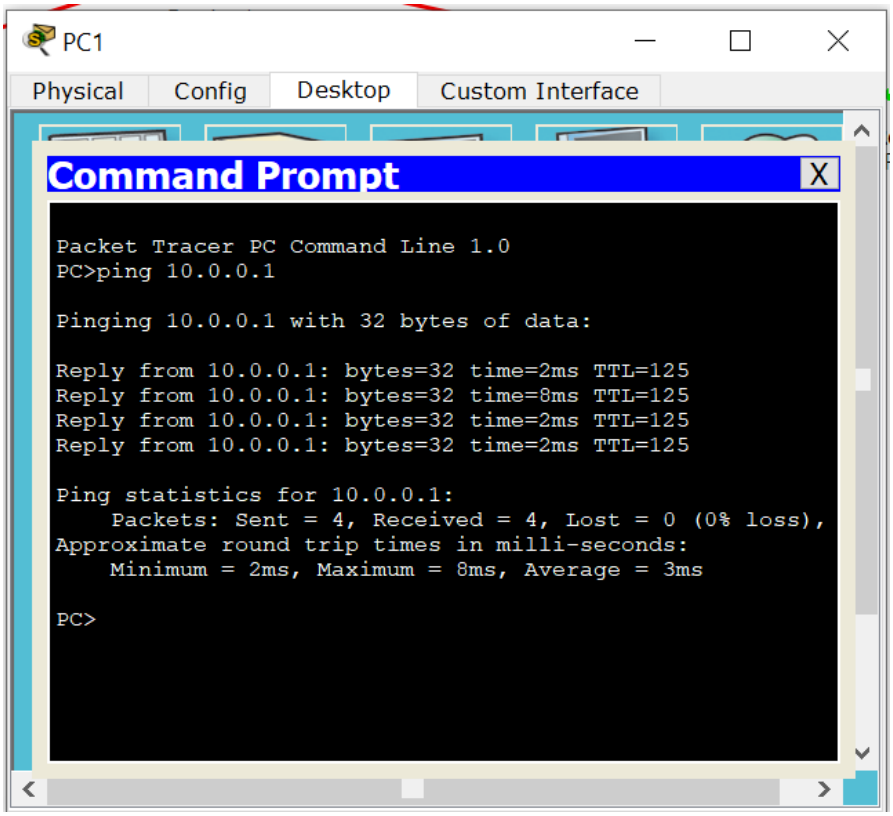
PROGRAM 2.1

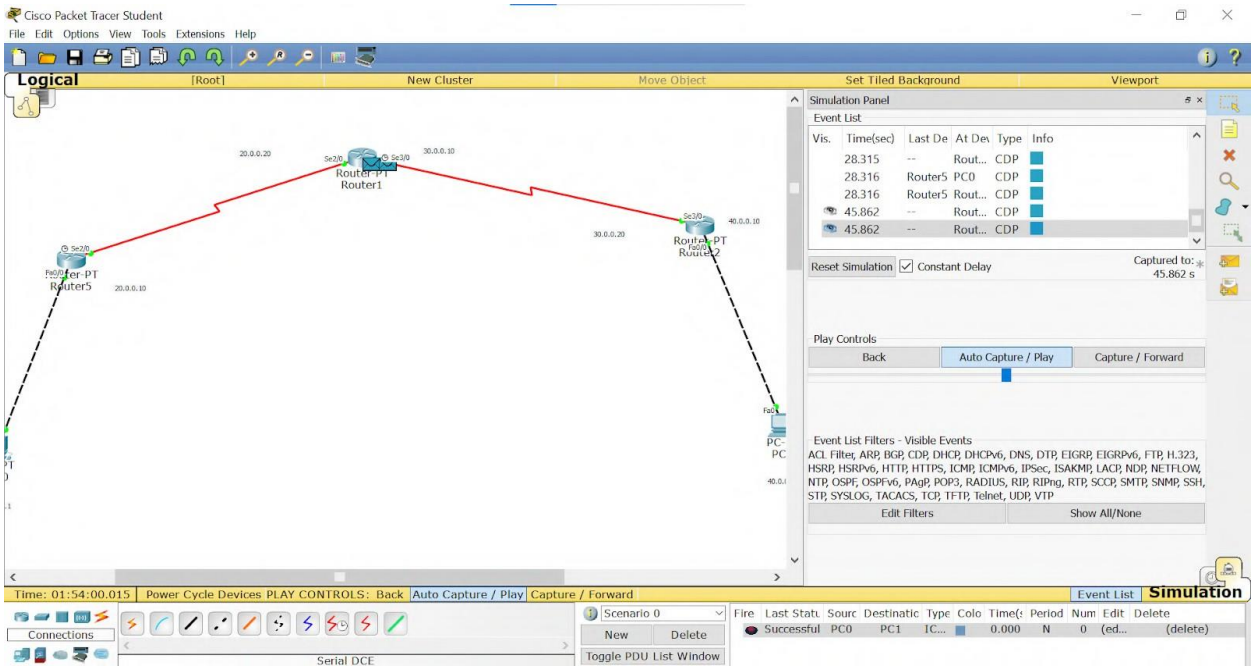




PROGRAM 2.2


PC0
Physical
Config
Desktop
Custom Interface
Command Prompt
Packet Tracer PC Command Line 1.0
PC>ping 40.0.0.1
Pinging 40.0.0.1 with 32 bytes of data:
Reply from 10.0.0.10: Destination host unreachable.
Reply from 10.0.0.10: Destination host unreachable.
Reply from 10.0.0.10: Destination host unreachable.
Request timed out.
Ping statistics for 40.0.0.1:
Packets: Sent = 4, Received = 0, Lost = 4 (100%
loss),
PC>

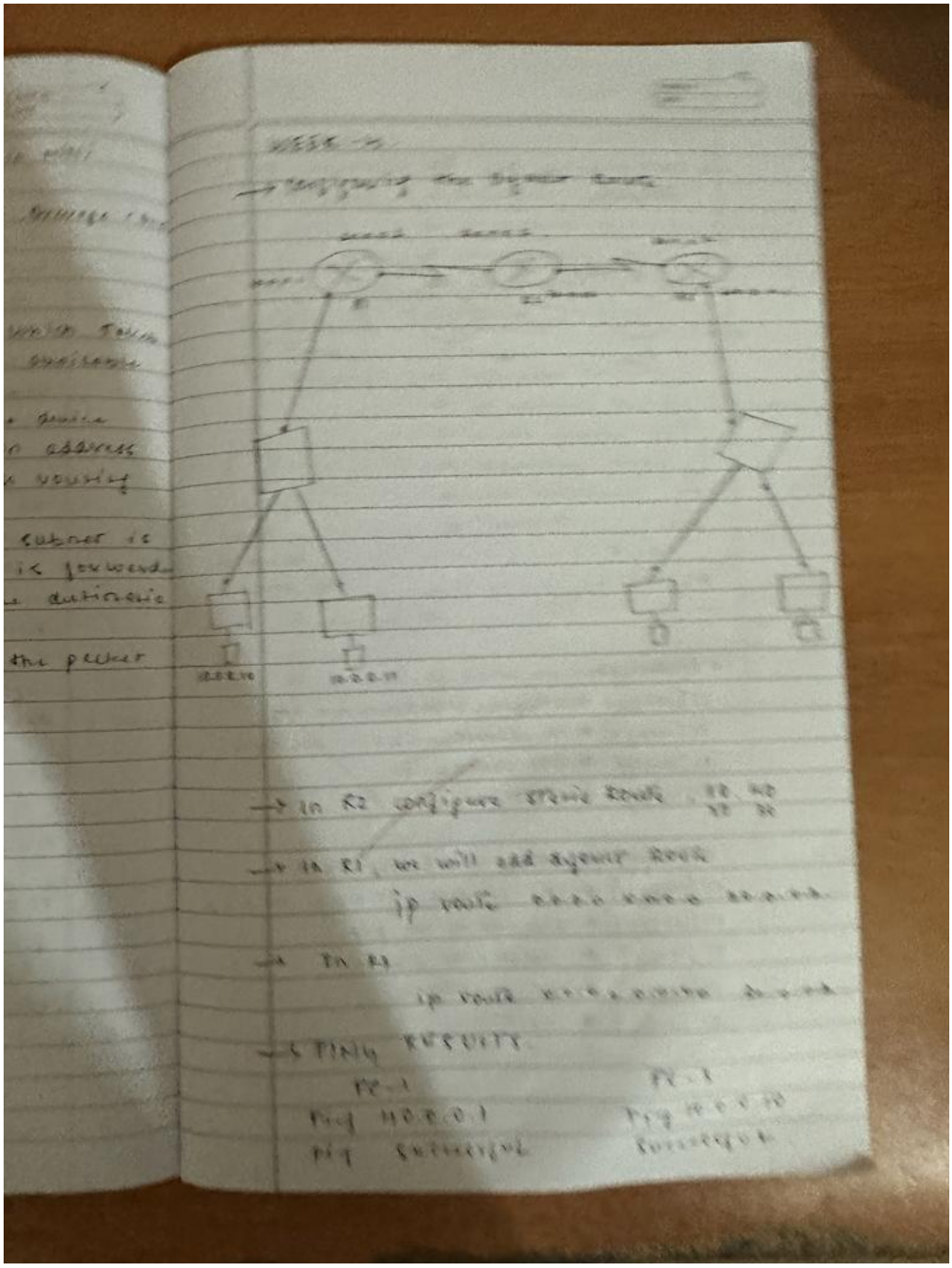

PC1
Physical
Config
Desktop
Custom Interface
Command Prompt
Packet Tracer PC Command Line 1.0
PC>ping 10.0.0.1
Pinging 10.0.0.1 with 32 bytes of data:
Reply from 10.0.0.1: bytes=32 time=2ms TTL=125
Reply from 10.0.0.1: bytes=32 time=8ms TTL=125
Reply from 10.0.0.1: bytes=32 time=2ms TTL=125
Reply from 10.0.0.1: bytes=32 time=2ms TTL=125
Ping statistics for 10.0.0.1:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 2ms, Maximum = 8ms, Average = 3ms
PC>


Cisco Packet Tracer Student
File Edit Options View Tools Extensions Help
Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
Router1
Router5
Router2
PC-PC
Simulation Panel
Event List
Vis. Time(sec) Last De At Dev Type Info
28.315 -- Rout... CDP
28.316 Router5 PC0 CDP
28.316 Router5 Rout... CDP
45.862 -- Rout... CDP
45.862 -- Rout... CDP
Reset Simulation
Constant Delay
Captured to: 45.862 s
Play Controls
Back
Auto Capture / Play
Capture / Forward
Event List Filters - Visible Events
ACL Filter, ARP, BGP, CDP, DHCP, DHCPv6, DNS, DTP, EIGRP, EIGRPv6, FTP, H.323, HSRP, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPSec, ISAKMP, LACP, NDP, NETFLOW, NTP, OSPF, OSPFv6, PAgP, POP3, RADIUS, RIP, RIPng, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, VTP
Edit Filters
Show All/None
Time: 01:54:00.015
Power Cycle Devices PLAY CONTROLS: Back
Auto Capture / Play
Capture / Forward
Event List
Simulation
Connections
Serial DCE
Scenario 0
New
Delete
Toggle PDU List Window
Fire Last Statu Sourc Destinatic Type Colo Time(s Period Num Edit Delete
Successful PC0 PC1 IC... 0.000 N 0 (ed... (delete)

WEEK 3

Configure default route, static route to the Router.

OBSERVATION:



In Router R2.

R2 [config] # interface serial 1/0.
ip address 30.0.0.2 255.0.0.0
encapsulation PPP
no shurdown.
Exit

R2 [config] # interface serial 1/1
ip address 30.0.0.1 255.0.0.0
encapsulation PPP
clock rate 64000
no shurdown
exit.

In Router R3.

R3 [config] # interface serial 0/0
ip address 500.0.2 255.0.0.0
encapsulation PPP
no shurdown.
exit

R3 [config] # interface fastethernet 2/0
ip address 40.0.0.1 255.0.0.0
no shurdown
exit

→ Configure RIP to the Router.

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* Default gateway is the router address (10.0.0.0.2.7)
* DNS server is the server address. (10.0.0.1).
* TFTP address is the server address. (10.0.0.1)
* Change the start address to 10.0.0.1
* Now go to end device → desktop → IP configuration.
* In IP configuration select DHCP.
* The IP address will be set dynamically

OUTPUT

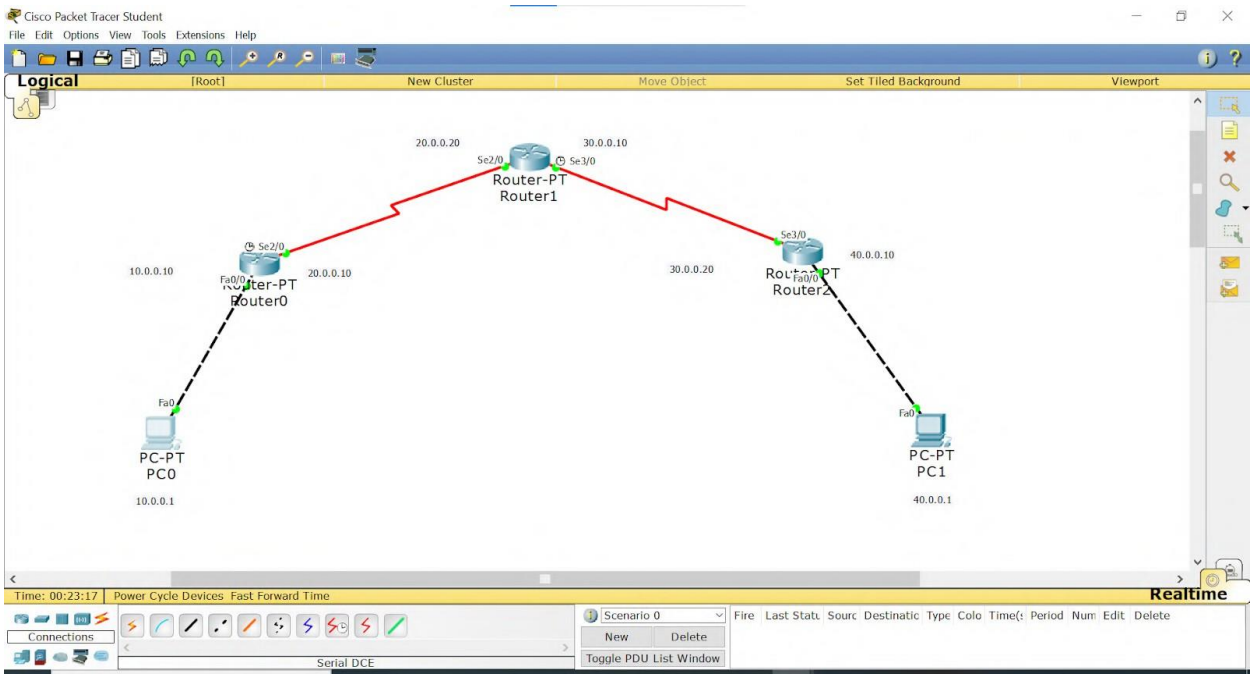
PC-1

IP address 10.0.0.3.

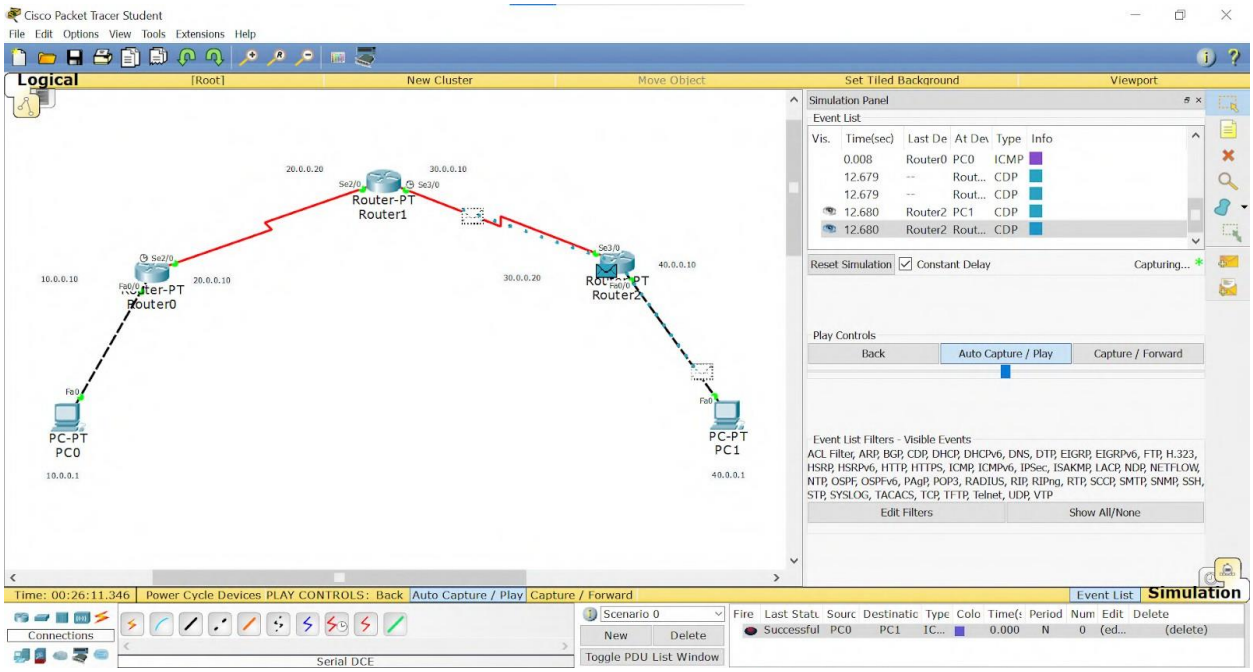
PC-2

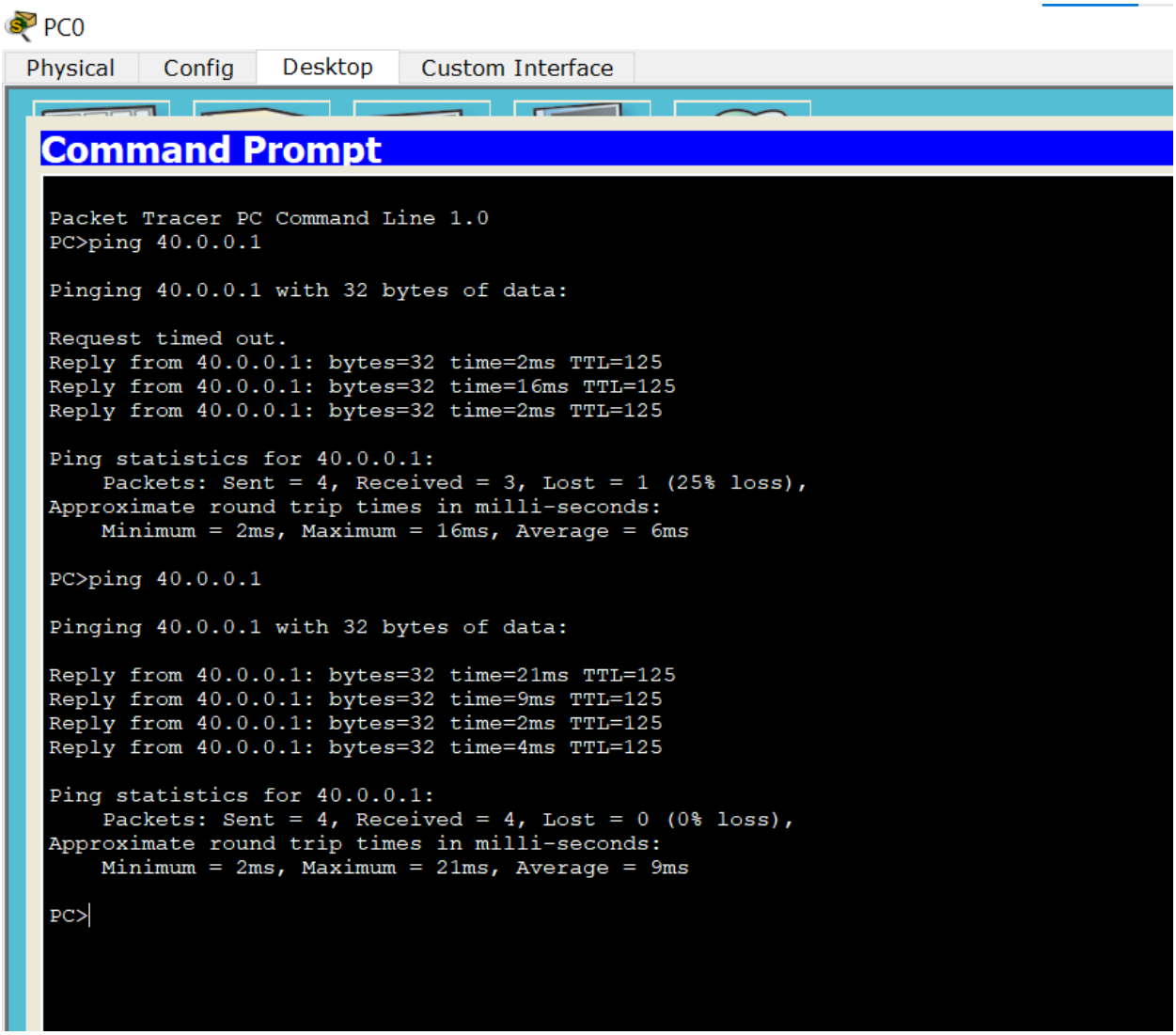
IP address 10.0.0.4.

TOPOLOGY:



OUTPUT:

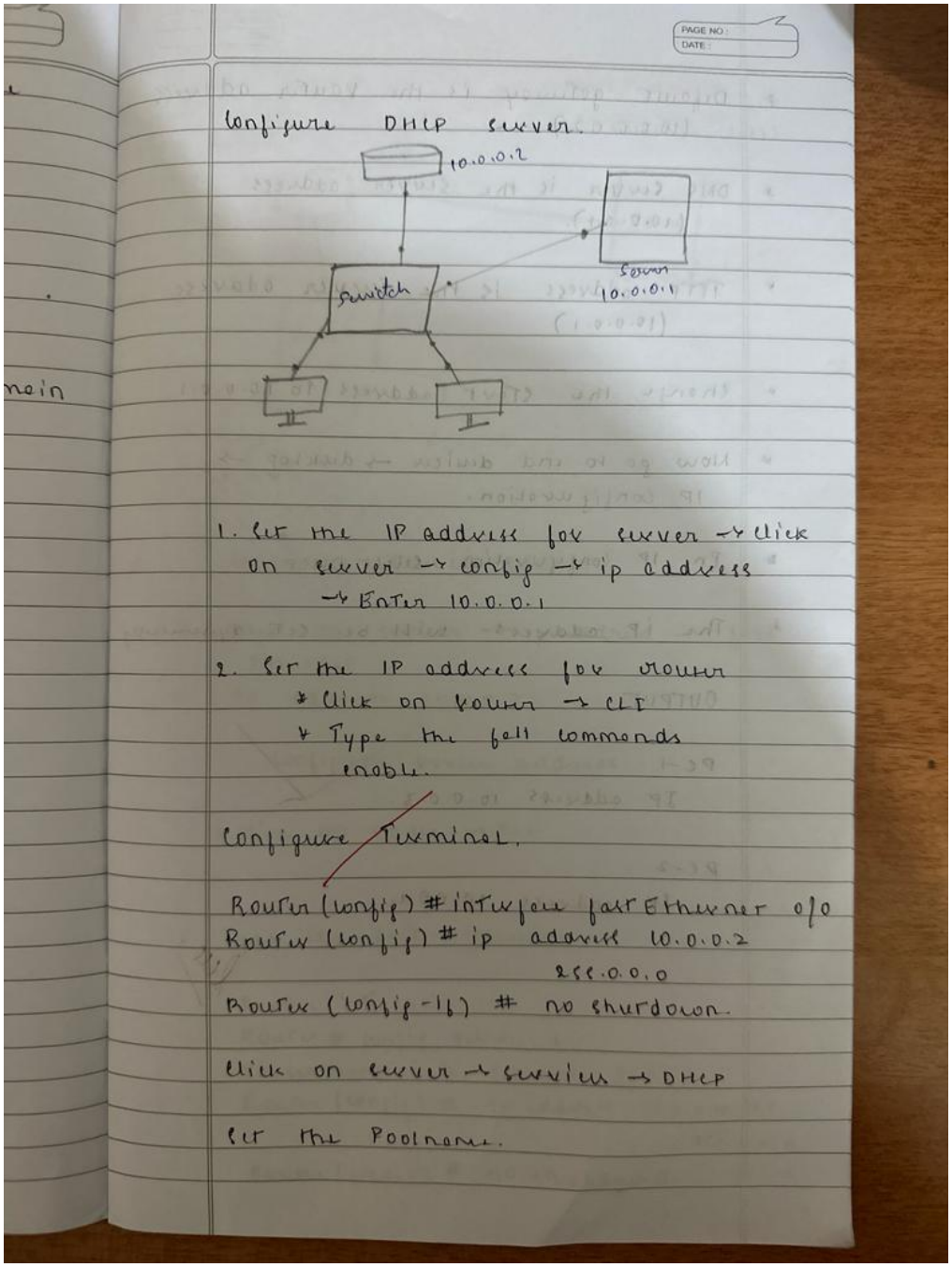



PC0
Physical
Config
Desktop
Custom Interface
Command Prompt
Packet Tracer PC Command Line 1.0
PC>ping 40.0.0.1
Pinging 40.0.0.1 with 32 bytes of data:
Request timed out.
Reply from 40.0.0.1: bytes=32 time=2ms TTL=125
Reply from 40.0.0.1: bytes=32 time=16ms TTL=125
Reply from 40.0.0.1: bytes=32 time=2ms TTL=125
Ping statistics for 40.0.0.1:
Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
Minimum = 2ms, Maximum = 16ms, Average = 6ms
PC>ping 40.0.0.1
Pinging 40.0.0.1 with 32 bytes of data:
Reply from 40.0.0.1: bytes=32 time=21ms TTL=125
Reply from 40.0.0.1: bytes=32 time=9ms TTL=125
Reply from 40.0.0.1: bytes=32 time=2ms TTL=125
Reply from 40.0.0.1: bytes=32 time=4ms TTL=125
Ping statistics for 40.0.0.1:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 2ms, Maximum = 21ms, Average = 9ms
PC>

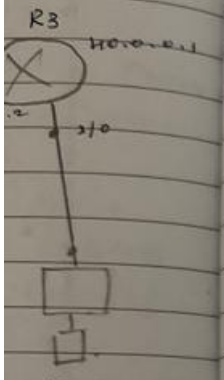
WEEK 4

Configure DHCP within a LAN and outside LAN.

OBSERVATION:



to a



In Router R2.

R2 [config] # interface serial 1/0.
ip address 30.0.0.2 255.0.0.0
encapsulation PPP
no shurdown.
Exit.

R2 [config] # interface serial 1/1
ip address 30.0.0.1 255.0.0.0
encapsulation PPP
clock rate 64000
no shurdown
exit.

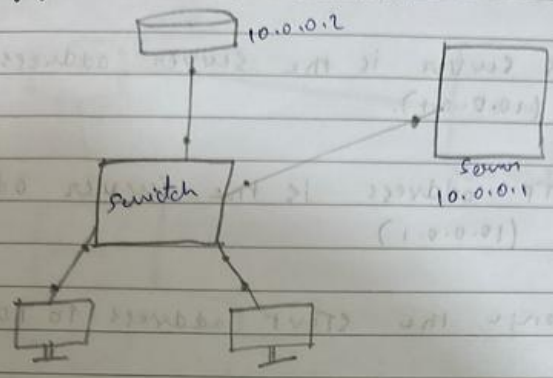
In Router R3.

R3 [config] # interface serial 0/0
ip address 30.0.0.2 255.0.0.0
encapsulation PPP
no shurdown.
exit

R3 [config] # interface fastethernet 2/0
ip address 40.0.0.1 255.0.0.0
no shurdown
exit

→ Configure RIP to the Router.

Configure DHCP server.



1. Set the IP address for server → click on server → config → ip address → Enter 10.0.0.1

2. Set the IP address for router
   * Click on router → CLI
   * Type the following commands
     enable.

Configure Terminal.

Router (config) # interface fastEthernet 0/0
Router (config) # ip address 10.0.0.2 255.0.0.0
Router (config-if) # no shutdown.

Click on server → services → DHCP

Set the Poolname.

PAGE NO :
DATE :

* Default gateway is the router address (10.0.0.0.2.7)
* DNS server is the server address. (10.0.0.1).
* TFTP address is the server address. (10.0.0.1)
* Change the start address to 10.0.0.1
* Now go to end devices → desktop → IP configuration.
* In IP configuration select DHCP.
* The IP address will be set dynamically

OUTPUT

PC-1

IP address 10.0.0.3.

PC-2

IP address 10.0.0.4.

DATE :

Router (config-if) # interface fa1/0

Router (config-if) # ip address 20.0.0.10 255.0.0.0.

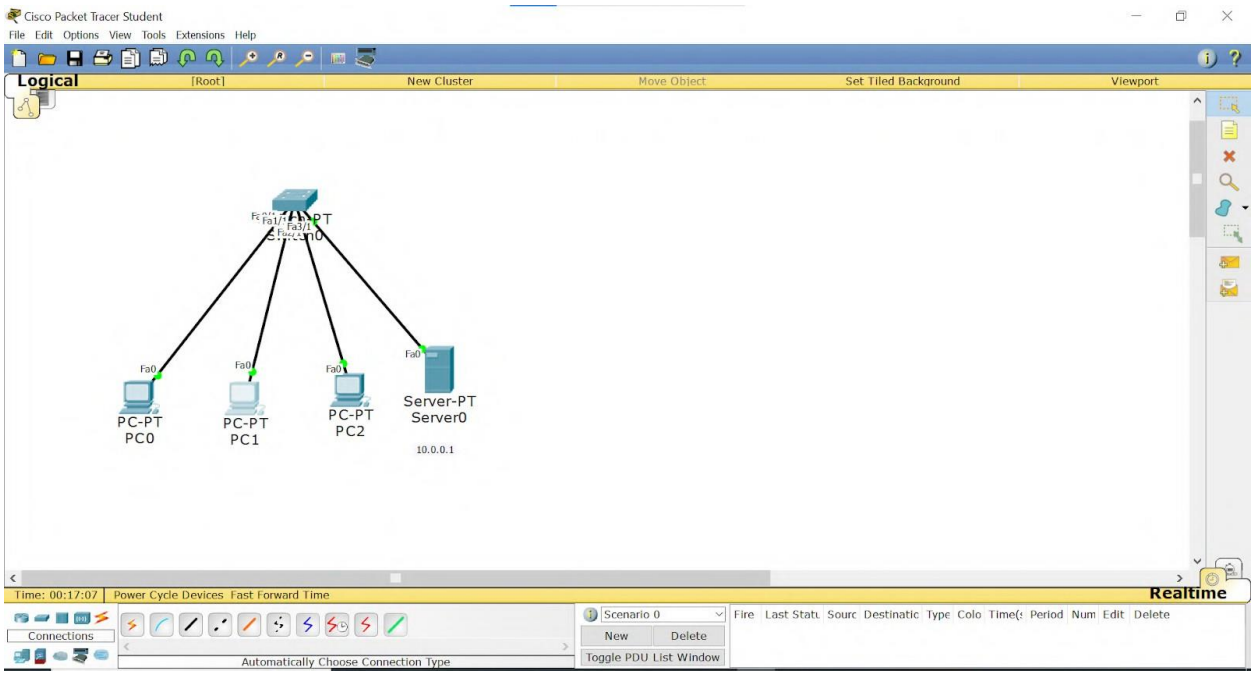
Router (config-if) # ip helper-address 10.0.0.2

Router (config-if) # no shutdown.

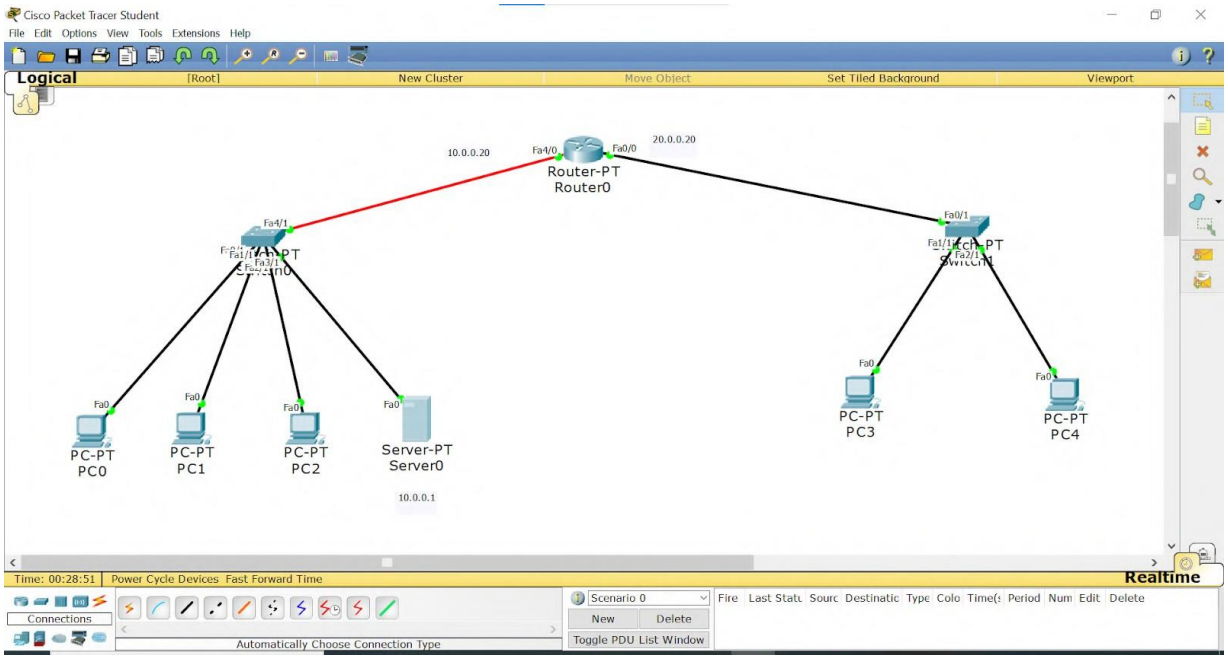
Lee
2/8/23

TOPOLOGY:

PROGRAM 4.1:

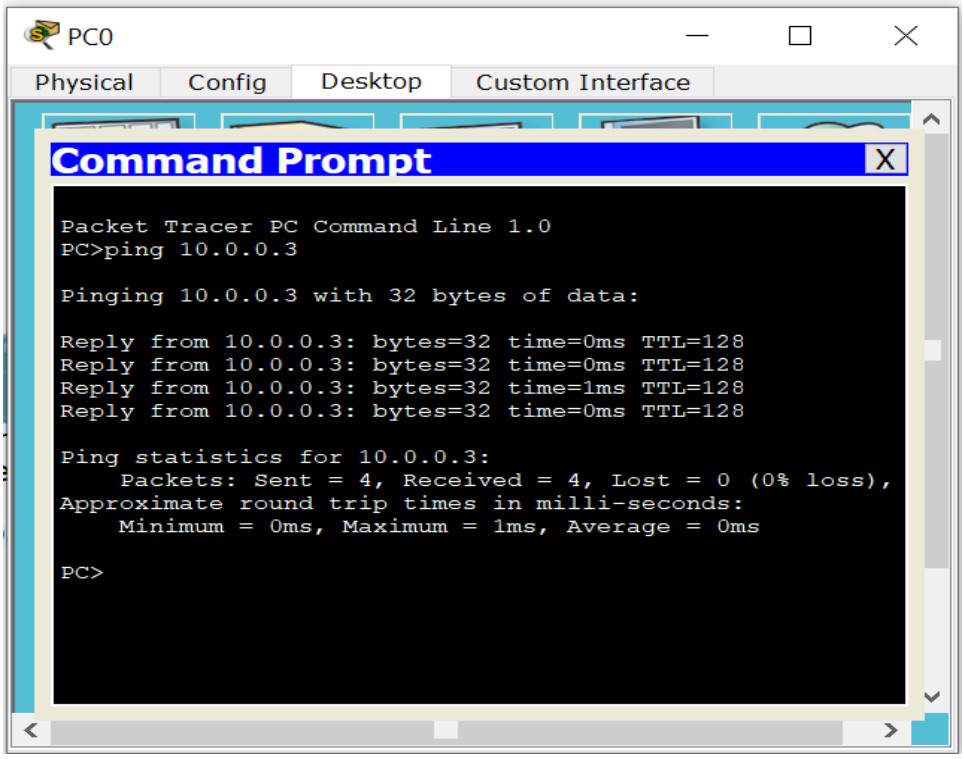


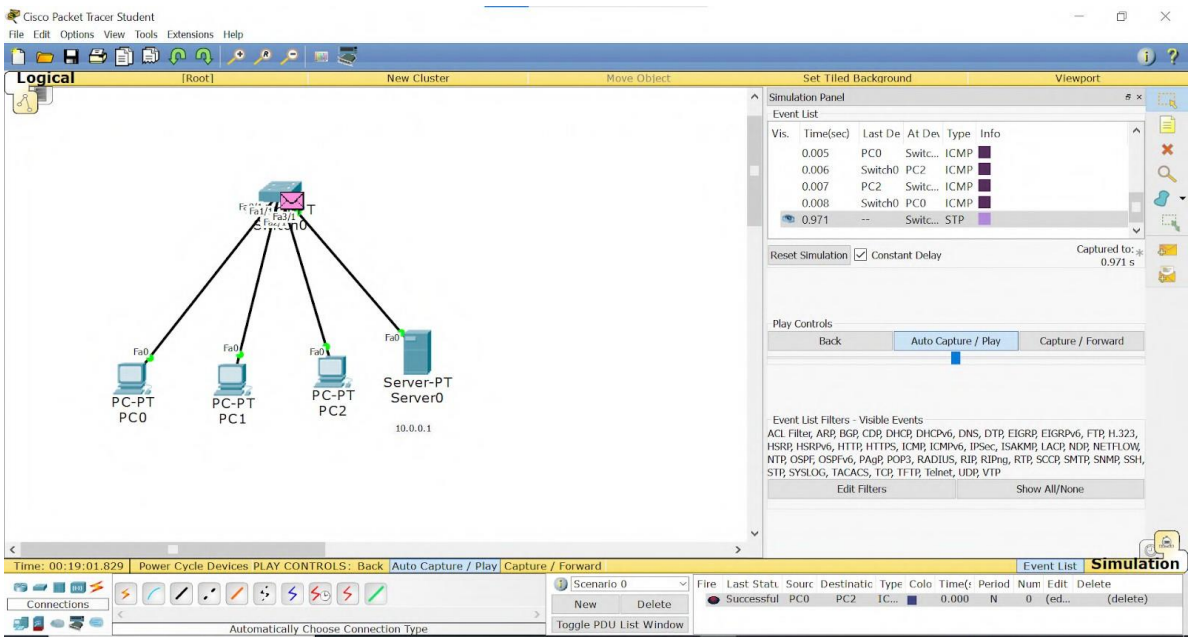
PROGRAM 4.2:



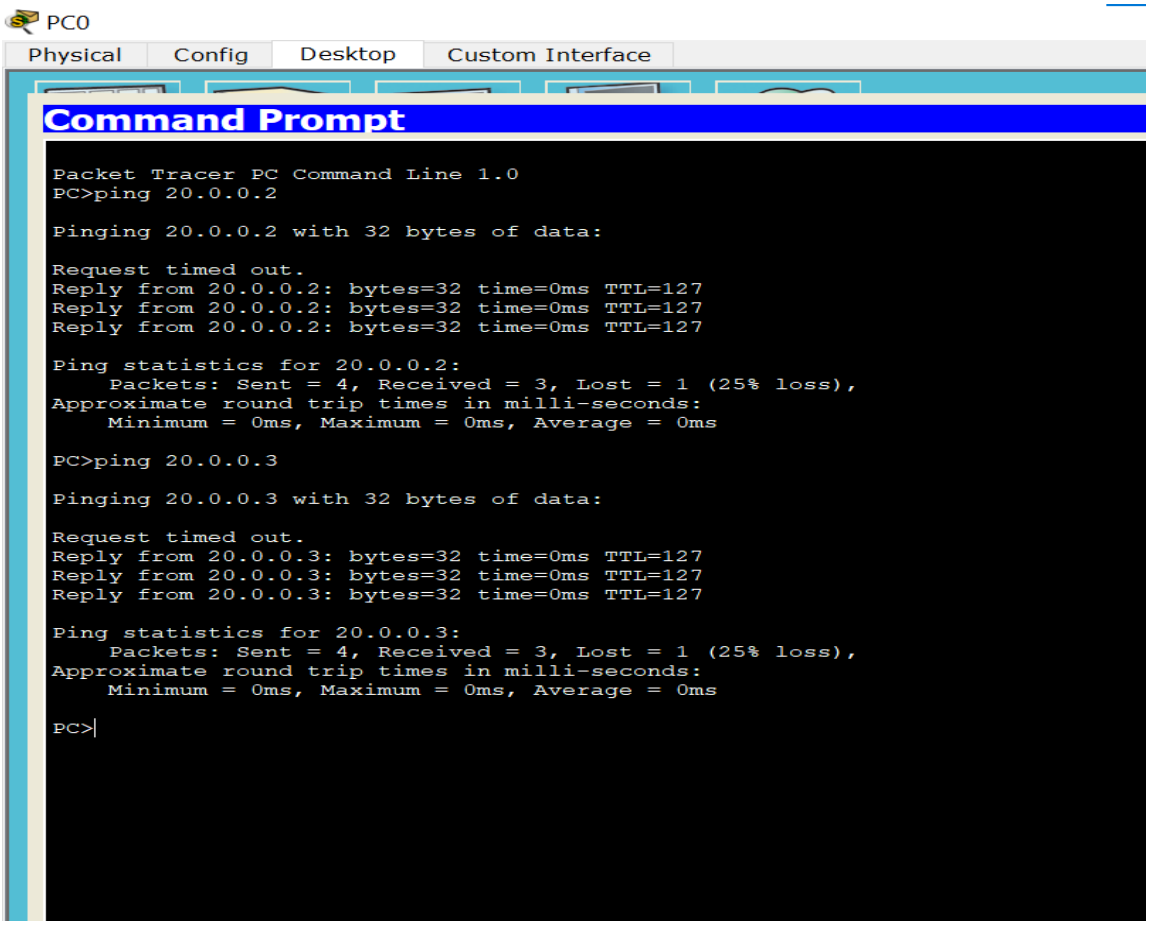
OUTPUT:

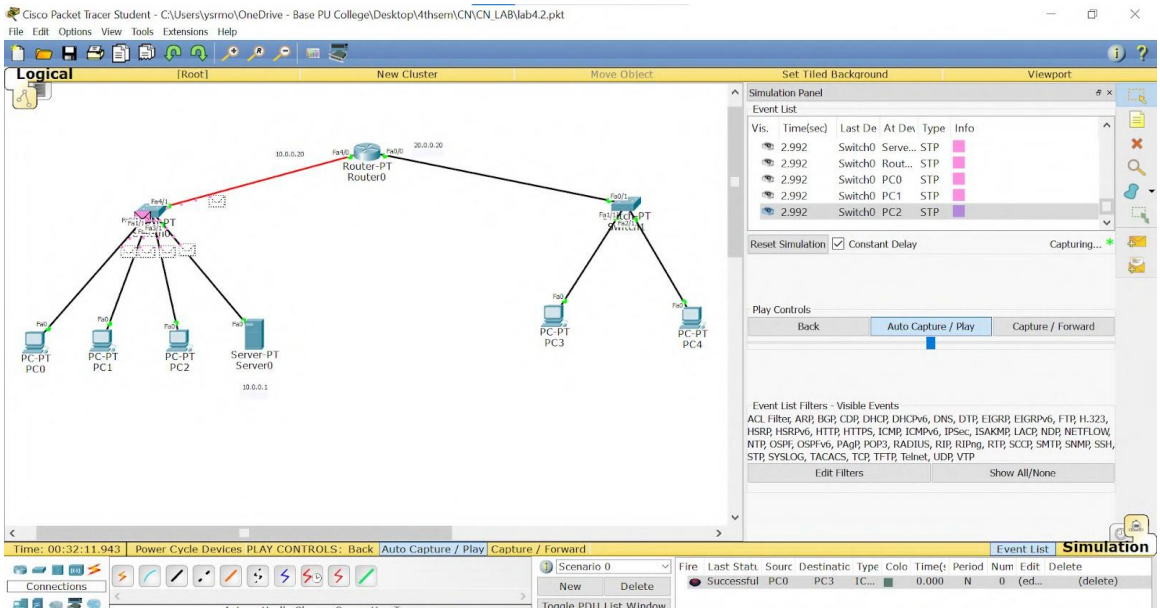
PROGRAM 4.1:





PROGRAM 4.2:

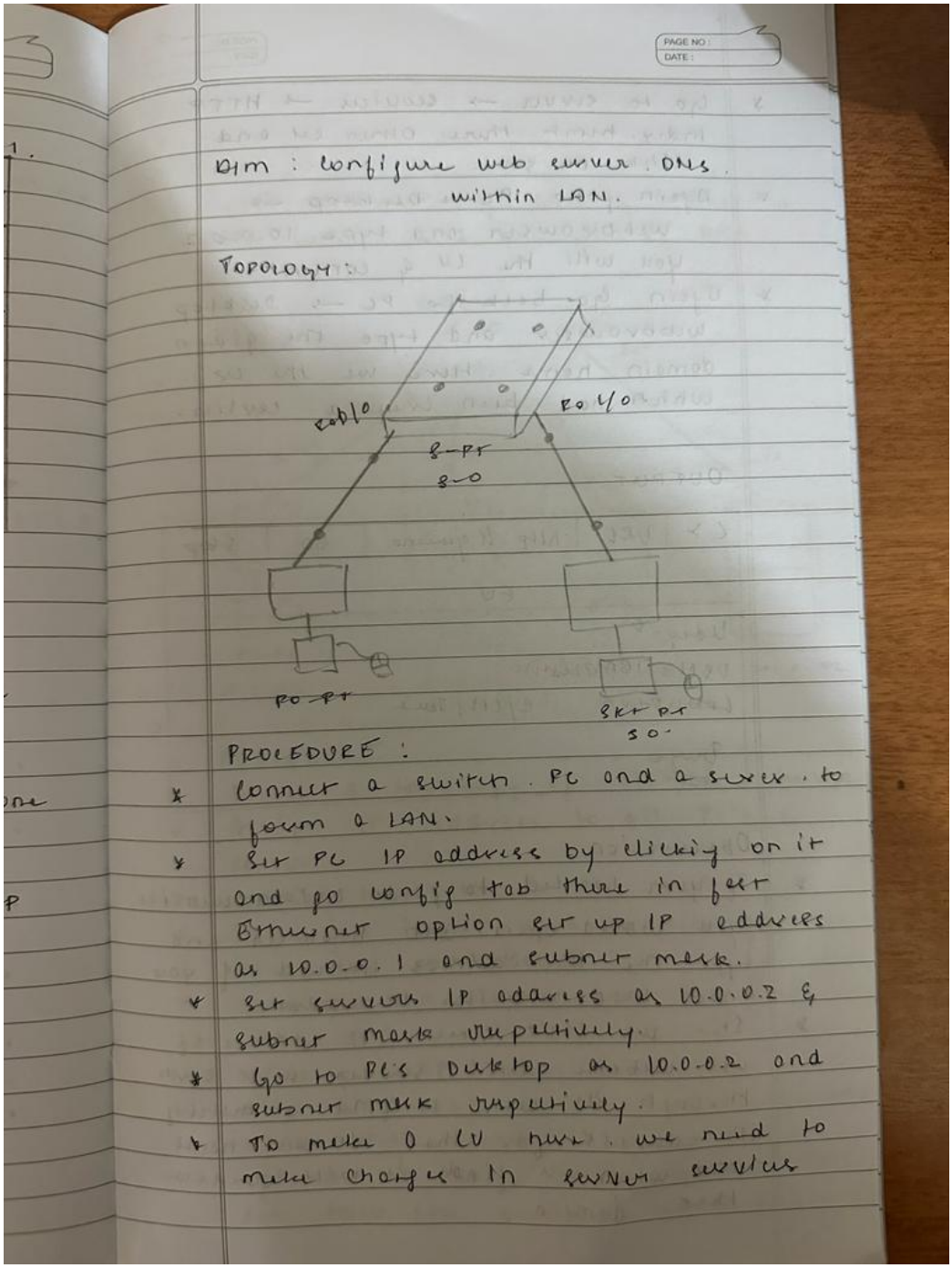

PC0
Physical
Config
Desktop
Custom Interface
Command Prompt
Packet Tracer PC Command Line 1.0
PC>ping 20.0.0.2
Pinging 20.0.0.2 with 32 bytes of data:
Request timed out.
Reply from 20.0.0.2: bytes=32 time=0ms TTL=127
Reply from 20.0.0.2: bytes=32 time=0ms TTL=127
Reply from 20.0.0.2: bytes=32 time=0ms TTL=127
Ping statistics for 20.0.0.2:
Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms
PC>ping 20.0.0.3
Pinging 20.0.0.3 with 32 bytes of data:
Request timed out.
Reply from 20.0.0.3: bytes=32 time=0ms TTL=127
Reply from 20.0.0.3: bytes=32 time=0ms TTL=127
Reply from 20.0.0.3: bytes=32 time=0ms TTL=127
Ping statistics for 20.0.0.3:
Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms
PC>

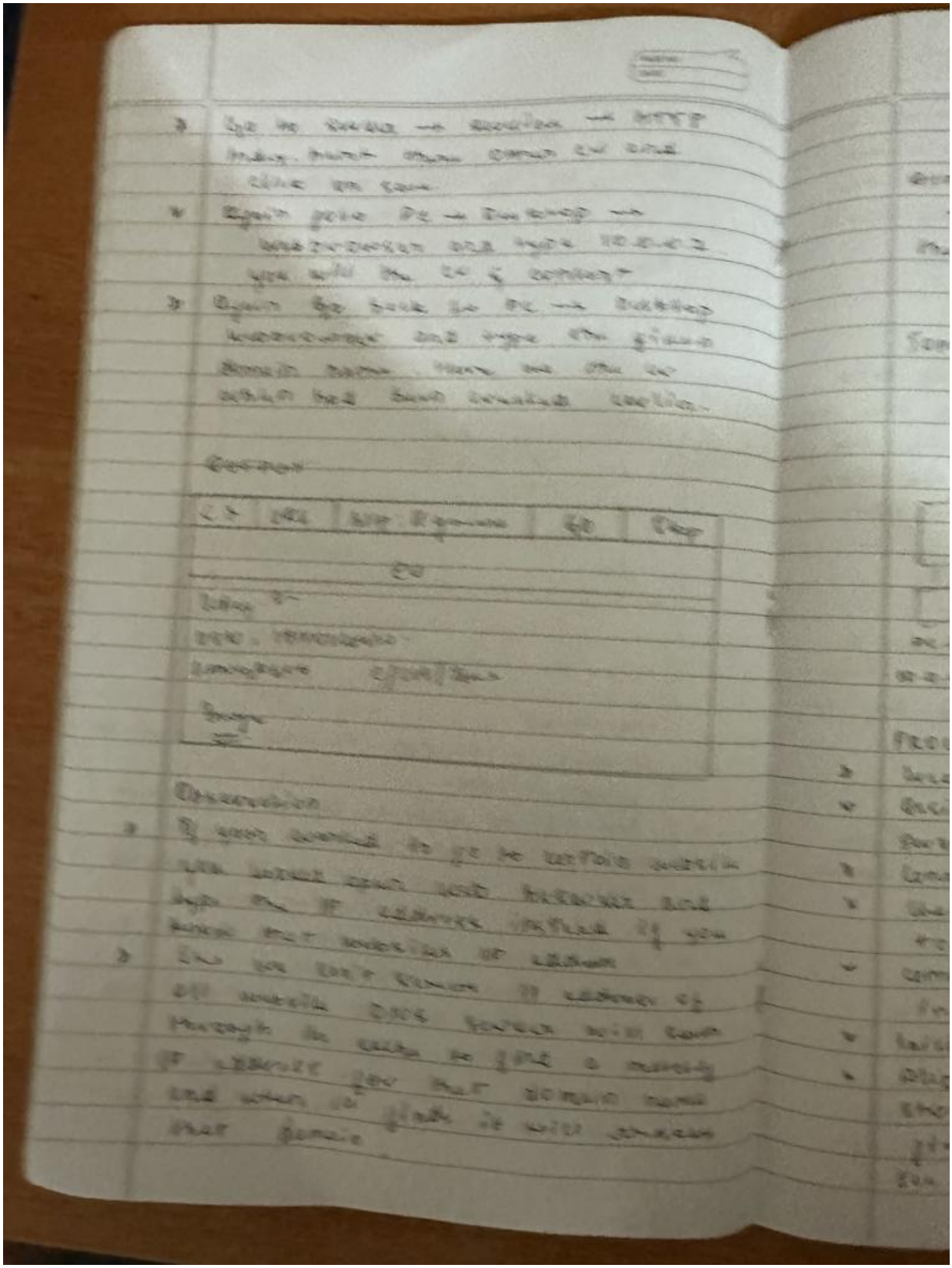

Cisco Packet Tracer Student - C:\Users\ysrmo\OneDrive - Base PU College\Desktop\4thsem\CN\CN_LAB\lab4.2.pkt
File Edit Options View Tools Extensions Help
Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
Router-PT
Router0
10.0.0.20
20.0.0.20
Server-PT
Server0
10.0.0.1
PC-PT
PC0
PC-PT
PC1
PC-PT
PC2
PC-PT
PC3
PC-PT
PC4
Simulation Panel
Event List
Vis. Time(sec) Last De At Dev Type Info
2.992 Switch0 Serve... STP
2.992 Switch0 Rout... STP
2.992 Switch0 PC0 STP
2.992 Switch0 PC1 STP
2.992 Switch0 PC2 STP
Reset Simulation
Constant Delay
Capturing...
Play Controls
Back
Auto Capture / Play
Capture / Forward
Event List Filters - Visible Events
ACL Filter, ARP, BGP, CDP, DHCP, DHCPv6, DNS, DTP, EIGRP, EIGRPv6, FTP, H.323, HSRP, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPSec, ISAKMP, LACP, NDP, NETFLOW, NTP, OSPF, OSPFv6, PAgP, POP3, RADIUS, RIP, RIPng, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, VTP
Edit Filters
Show All/None
Time: 00:32:11.943
Power Cycle Devices PLAY CONTROLS: Back Auto Capture / Play Capture / Forward
Event List
Simulation
Connections
Scenario 0
New
Delete
Toggle PDU List Window
Fire Last Statu Sourc Destinatic Type Colo Time(s Period Num Edit Delete
Successful PC0 PC3 IC... 0.000 N 0 (ed... (delete)

WEEK 5

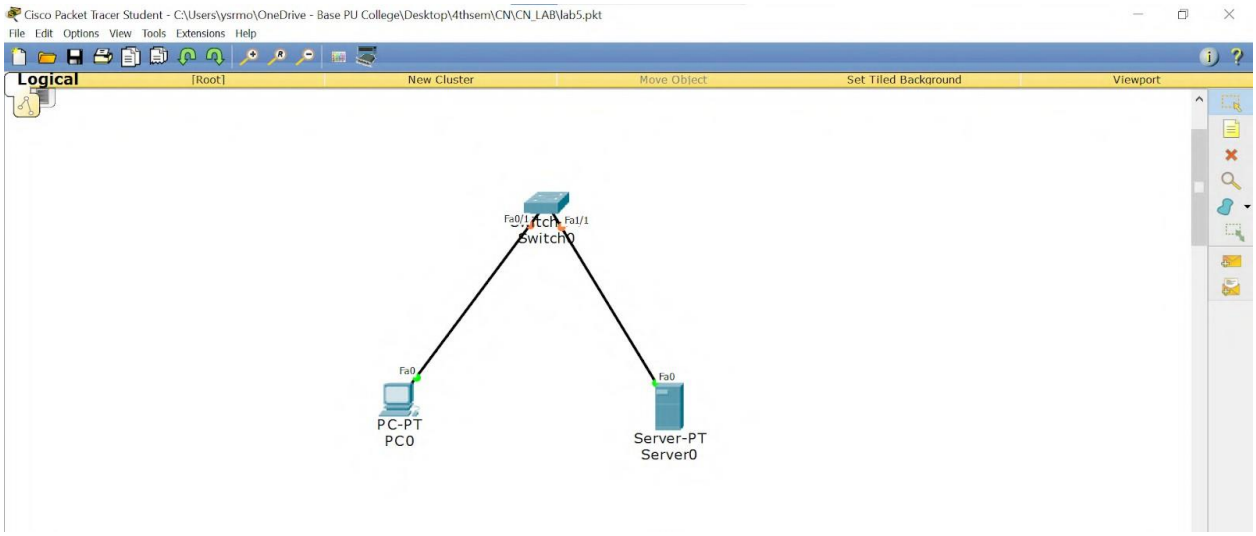
Configure Web Server, DNS within a LAN.

OBSERVATION:

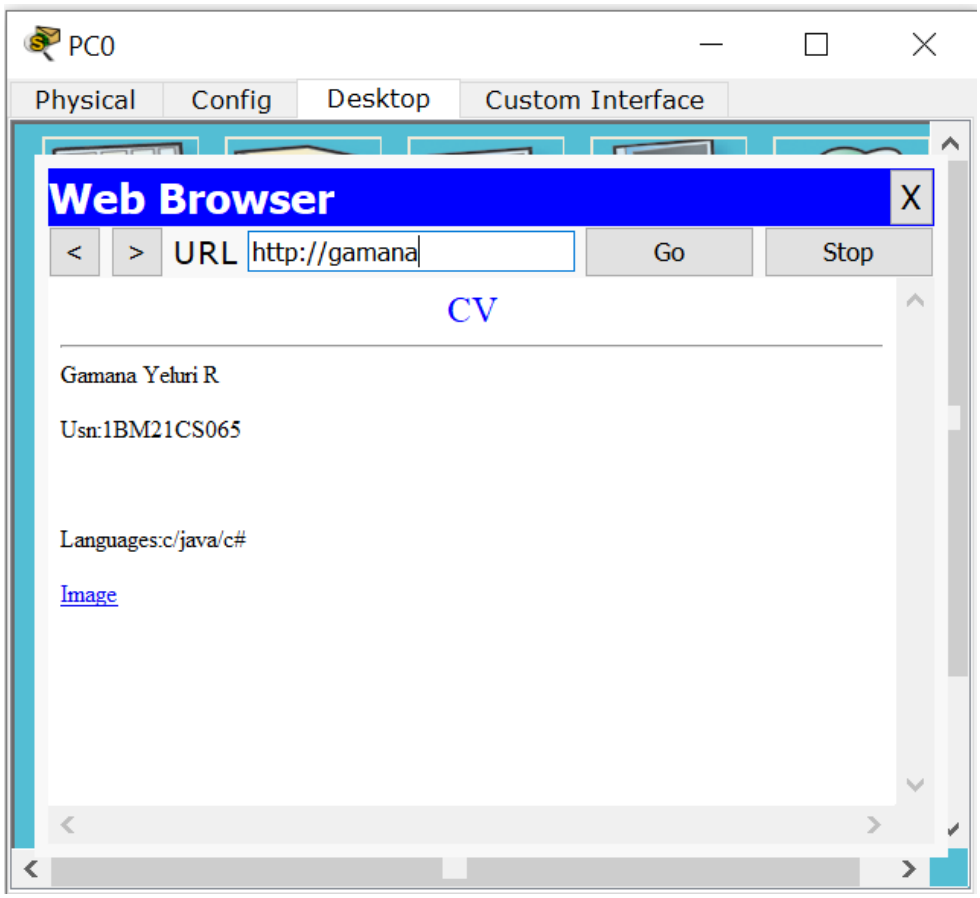




TOPOLOGY:



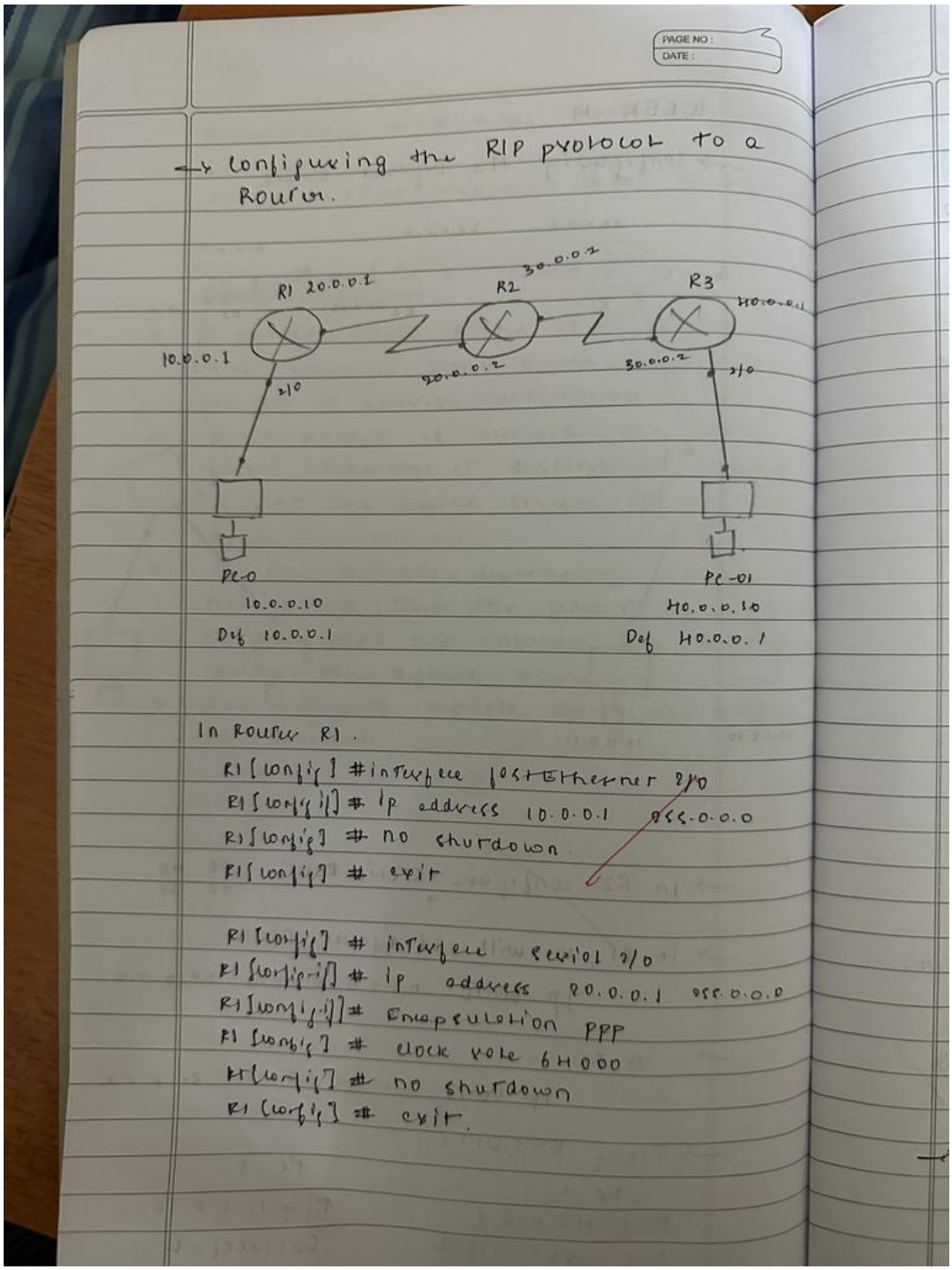
OUTPUT:



WEEK 6

Configure RIP routing Protocol in Routers.

OBSERVATION:



In Router R2.

R2 [config] # interface serial 1/0.
ip address 30.0.0.2 255.0.0.0
encapsulation PPP
no shurdown.
Exit.

R2 [config] # interface serial 1/1
ip address 30.0.0.1 255.0.0.0
encapsulation PPP
clock rate 64000
no shurdown
exit.

In Router R3.

R3 [config] # interface serial 0/0
ip address 30.0.0.2 255.0.0.0
encapsulation PPP
no shurdown.
exit.

R3 [config] # interface fastethernet 2/0
ip address 40.0.0.1 255.0.0.0
no shurdown
exit.

→ Configure RIP to the Router.

In Router R1

R1 [config] # router RIP
Router network 10.0.0.0
network 20.0.0.0
exit.

In Router R2.

R2 [config] # router RIP
network 20.0.0.0
network 30.0.0.0
exit.

In Router R3

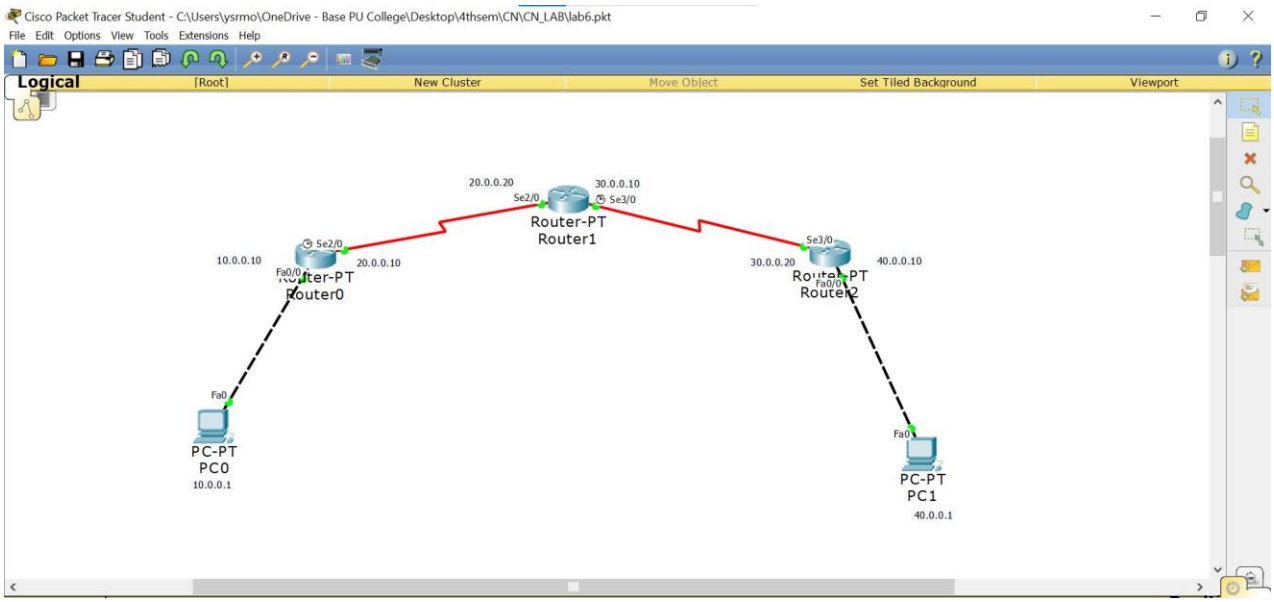
R3 [config] # router RIP
network 30.0.0.0
network 40.0.0.0
exit.

→ Show ip route for all router.
→ Ping every router.

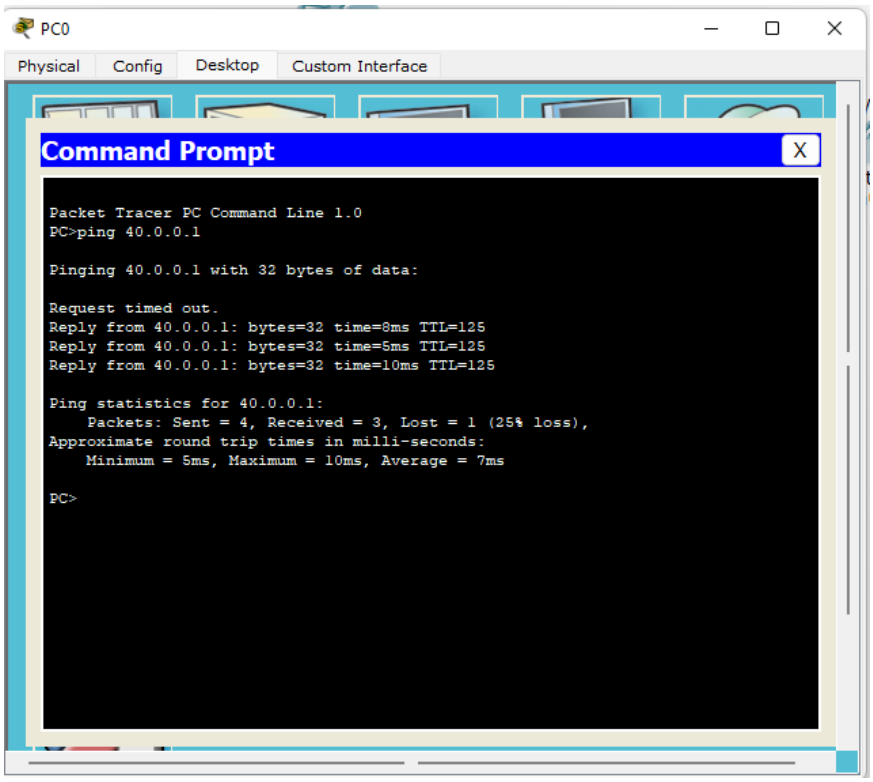
PING RESULTS.

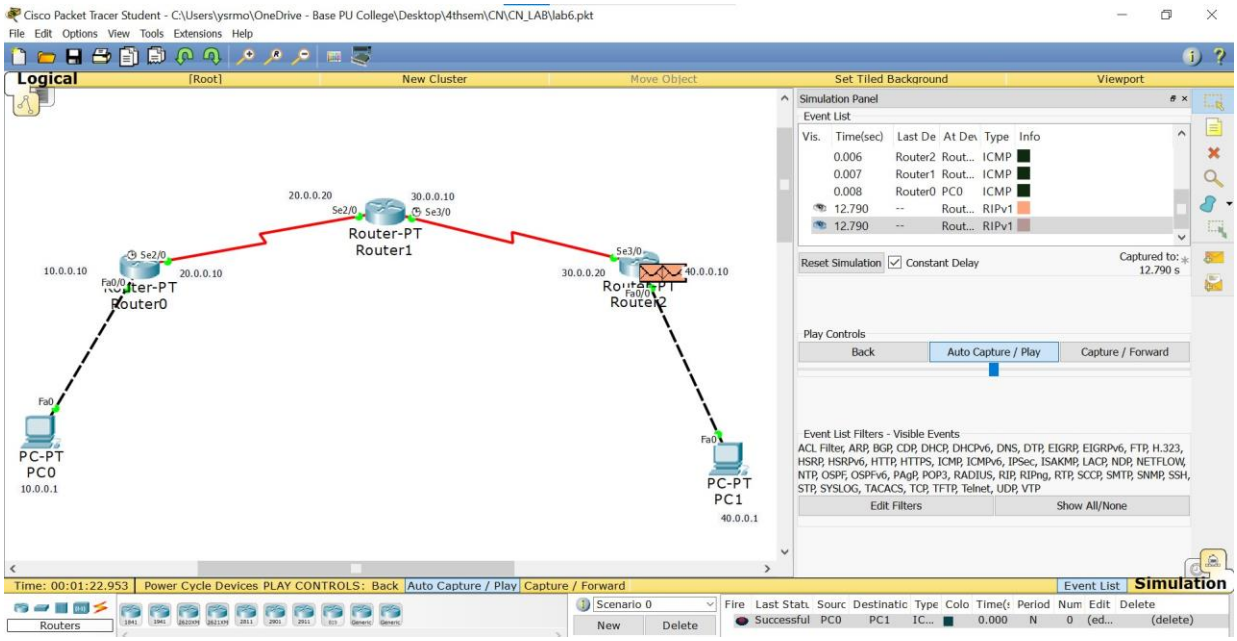
PC 0
Ping Successfull.

TOPOLOGY:



OUTPUT:

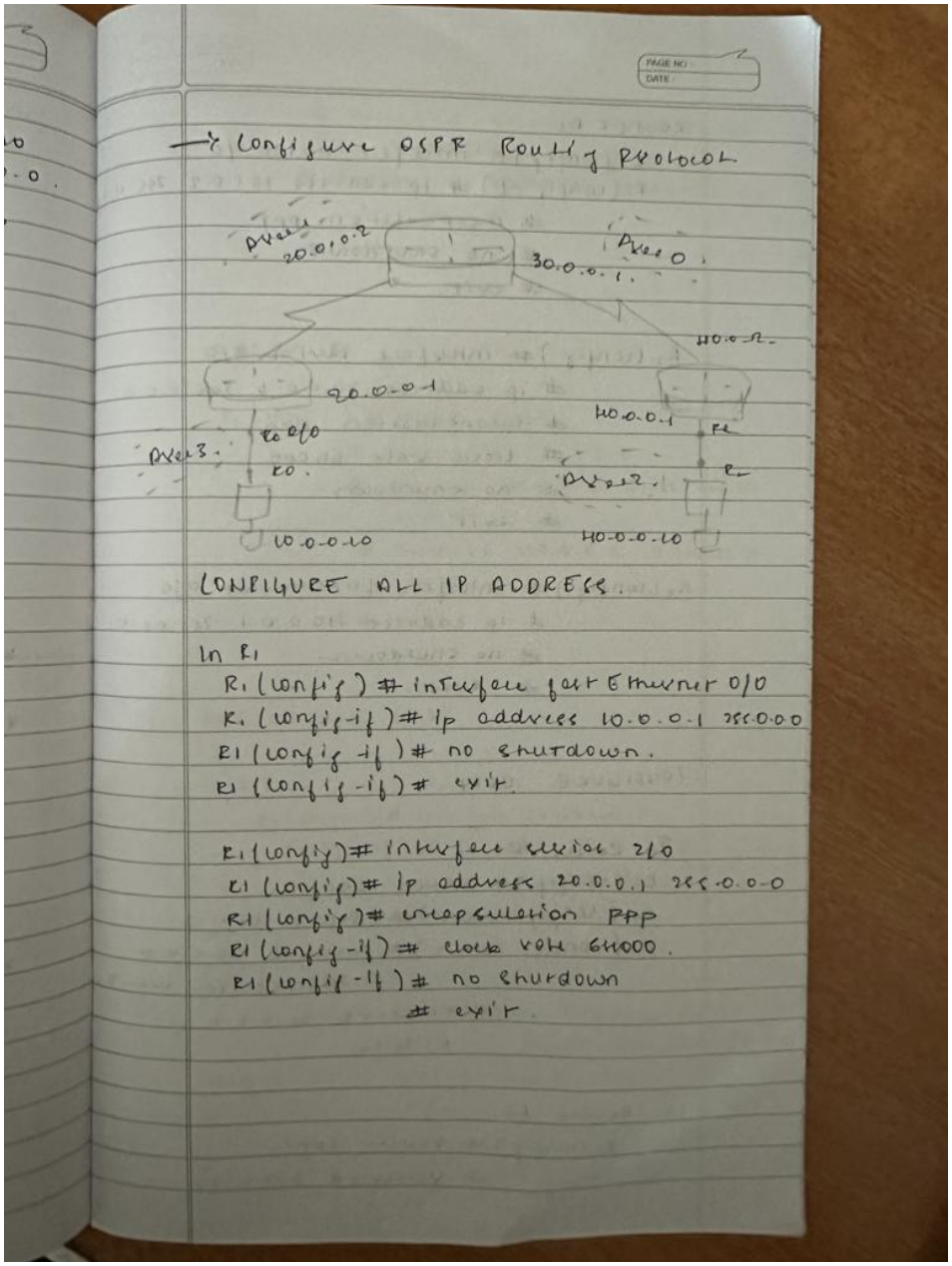



Cisco Packet Tracer Student - C:\Users\ysrmo\OneDrive - Base PU College\Desktop\4thsem\CN\CN_LAB\lab6.pkt
File Edit Options View Tools Extensions Help
Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
Router-PT
Router1
Router-PT
Router0
Router-PT
Router2
PC-PT
PC0
10.0.0.1
PC-PT
PC1
40.0.0.1
20.0.0.20
30.0.0.10
10.0.0.10
20.0.0.10
30.0.0.20
40.0.0.10
Simulation Panel
Event List
Vis. Time(sec) Last De At Dev Type Info
0.006 Router2 Rout... ICMP
0.007 Router1 Rout... ICMP
0.008 Router0 PC0 ICMP
12.790 -- Rout... RIPv1
12.790 -- Rout... RIPv1
Reset Simulation
Constant Delay
Captured to: 12.790 s
Play Controls
Back
Auto Capture / Play
Capture / Forward
Event List Filters - Visible Events
ACL Filter, ARP, BGP, CDP, DHCP, DHCPv6, DNS, DTP, EIGRP, EIGRPv6, FTP, H.323, HSRP, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPSec, ISAKMP, LACP, NDP, NETFLOW, NTP, OSPF, OSPFv6, PAgP, POP3, RADIUS, RIP, RIPng, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, VTP
Edit Filters
Show All/None
Time: 00:01:22.953
Power Cycle Devices PLAY CONTROLS: Back
Auto Capture / Play
Capture / Forward
Event List
Simulation
Routers
Scenario 0
New
Delete
Fire Last Statu Sourc Destinatic Type Colo Time(s Period Num Edit Delete
Successful PC0 PC1 IC... 0.000 N 0 (ed... (delete)

WEEK 7

Configure OSPF routing protocol.

OBSERVATION:



ROUTER R2.

R2(config)# interface serial 2/0
R2(config-if)# ip address 20.0.0.2 255.0.0.0
encapsulation ppp
no shutdown.
exit.

R2(config)# interface serial 3/0
ip address 30.0.0.1 255.0.0.0
encapsulation PPP
clock rate 64000.
no shutdown.
exit.

R2(config)# interface fastethernet 0/0
ip address 40.0.0.1 255.0.0.0.
no shutdown.
exit.

CONFIGURE OSPF.

In Router R1.
R1(config)# router ospf 1.
R1(config-router)# router ospf 1
R1(config-router)# network 10.0.0.0
0.255.255.255. area 0
network 20.0.0.0
0.255.255.255.

In Router R2.
R2(config)# router ospf 1.
router-id 2.2.2.2.

network 20.0.0.0 0.255.255.255
area 1.
network 30.0.0.0 0.255.255.255
area 0.
exit.

In Router R3.

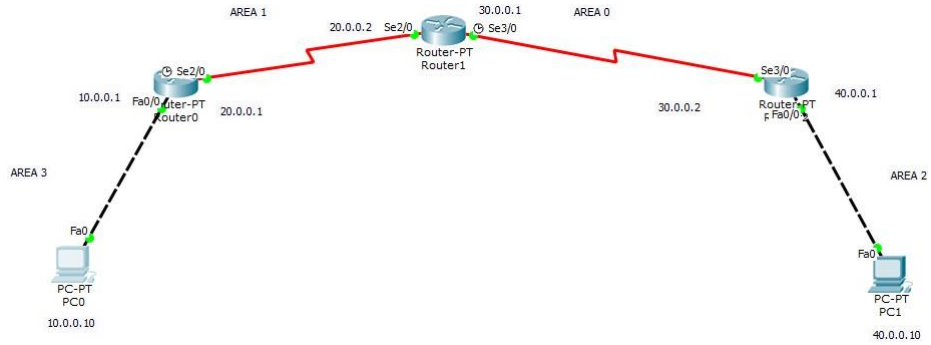
R3(config)# router ospf 1
router-id 3.3.3.3
network 40.0.0.0 0.255.255.255
area 0.
network 40.0.0.0 0.255.255.255
area 2.
exit.

Add virtual link.

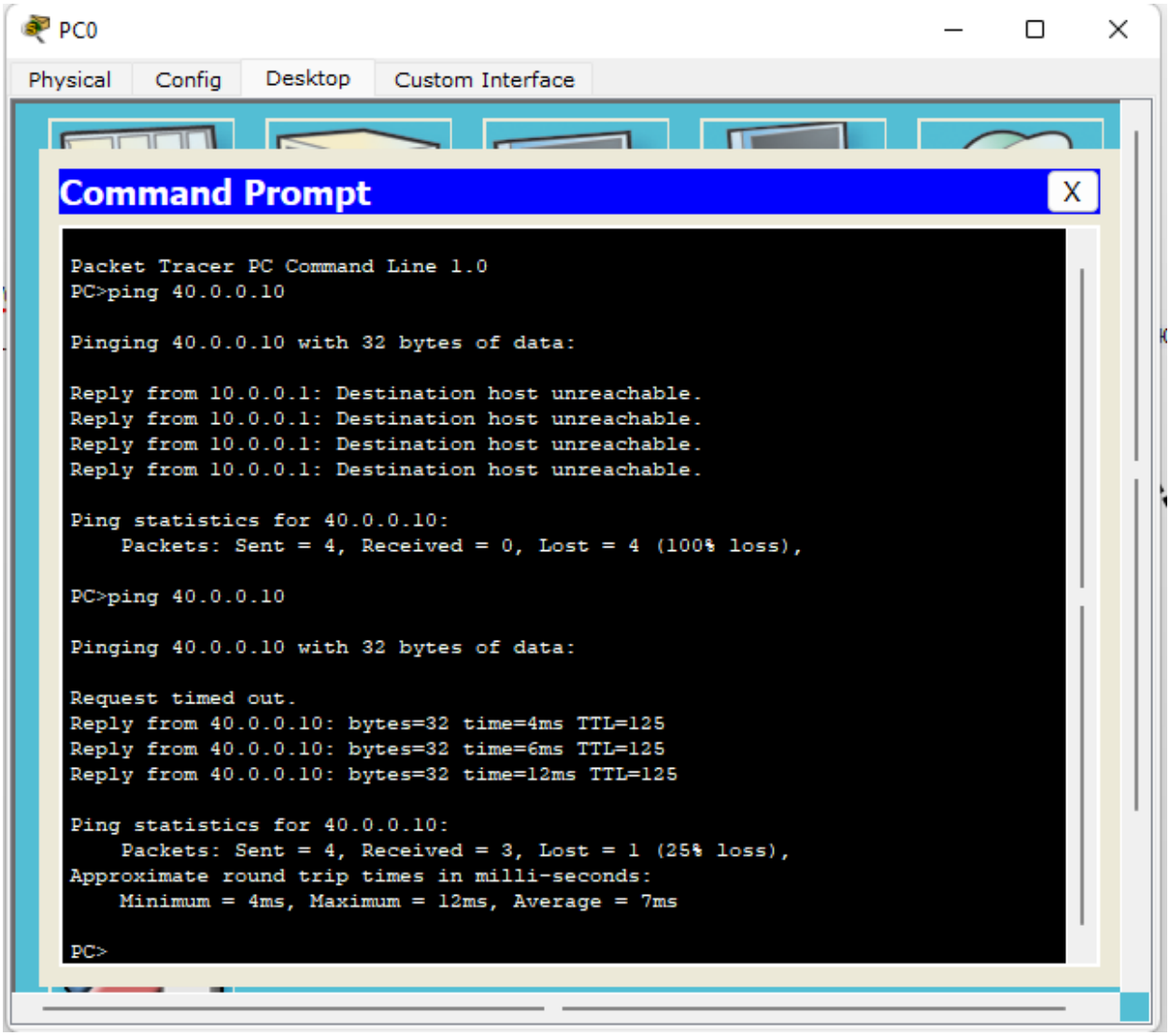
In R1;
R1(config)# interface loopback 0
(config-if)# ip add 172.16.1.252
255.255.0.0.
no shutdown

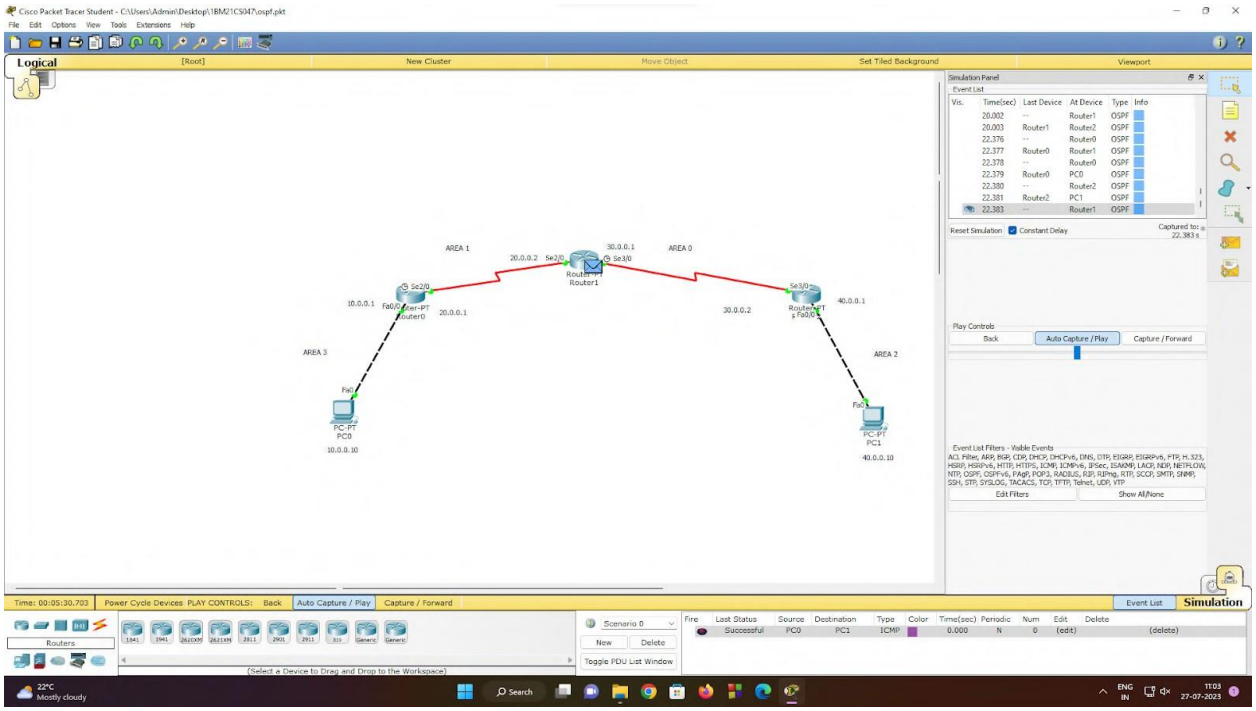
In R2.
R2(config)# interface loopback 0
ip add 12.16.1.254 255.255.0.0
no shutdown

TOPOLOGY:



OUTPUT:

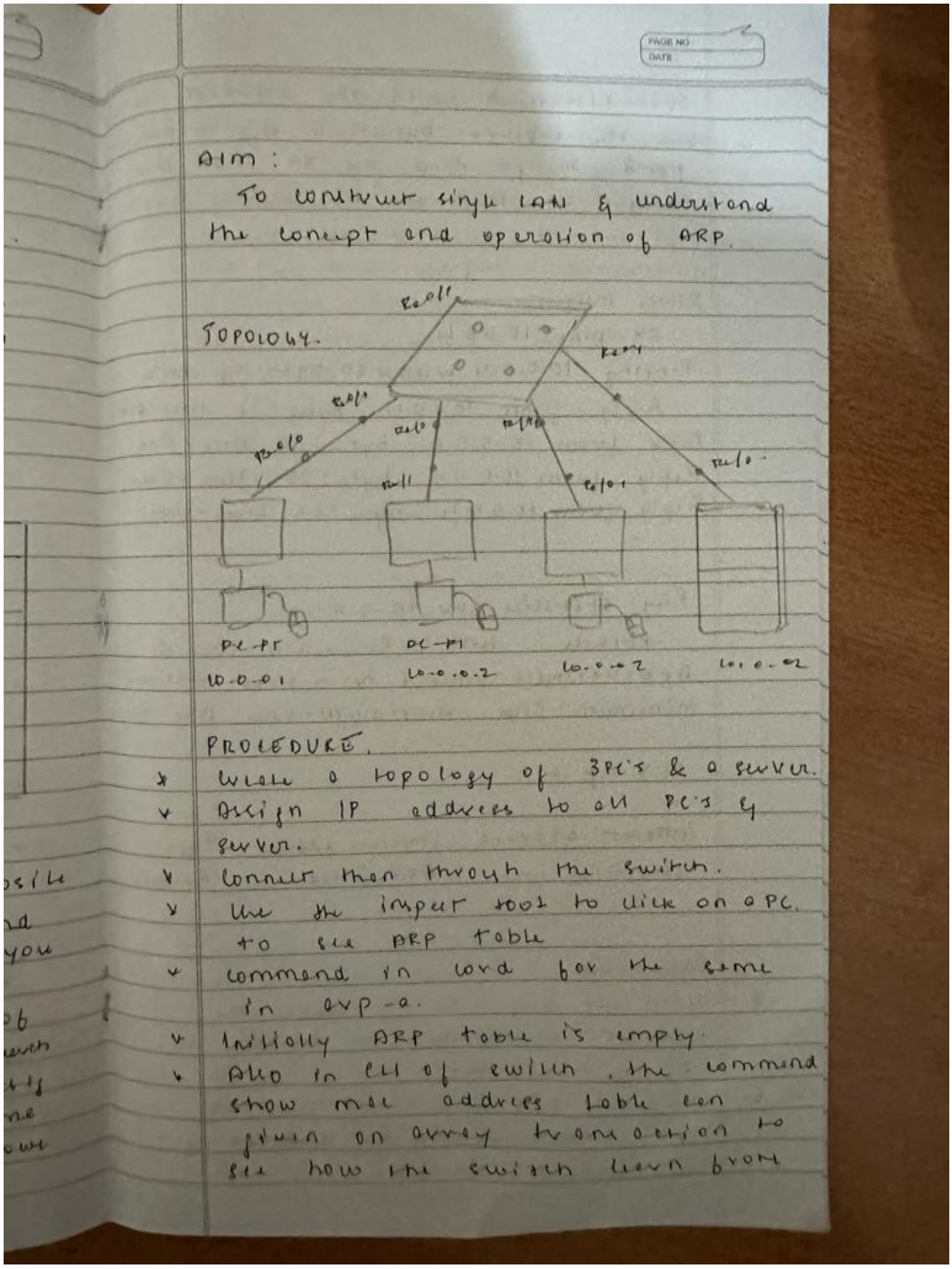



Cisco Packet Tracer Student - C:\Users\Admin\Desktop\1BM21CS047\ospf.pkt
File Edit Options View Tools Extensions Help
Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
AREA 1
AREA 0
AREA 3
AREA 2
20.0.0.2
Se2/0
30.0.0.1
Se3/0
Router1
Router0
10.0.0.1
Fa0/0
20.0.0.1
30.0.0.2
40.0.0.1
PC-PT
PC0
10.0.0.10
PC1
40.0.0.10
Simulation Panel
Event List
Vis.
Time(sec)
Last Device
At Device
Type
Info
Reset Simulation
Constant Delay
Play Controls
Back
Auto Capture / Play
Capture / Forward
Event List Filters - Visible Events
Edit Filters
Show All/None
Time: 00:05:30.703
Power Cycle Devices PLAY CONTROLS:
Routers
Scenario 0
New
Delete
Toggle PDU List Window
(Select a Device to Drag and Drop to the Workspace)
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Delete
Successful
PC0
PC1
ICMP
0.000
N
0
(edit)
(delete)
22°C
Mostly cloudy
Search
ENG
IN
11:03
27-07-2023

WEEK 8

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

OBSERVATION:



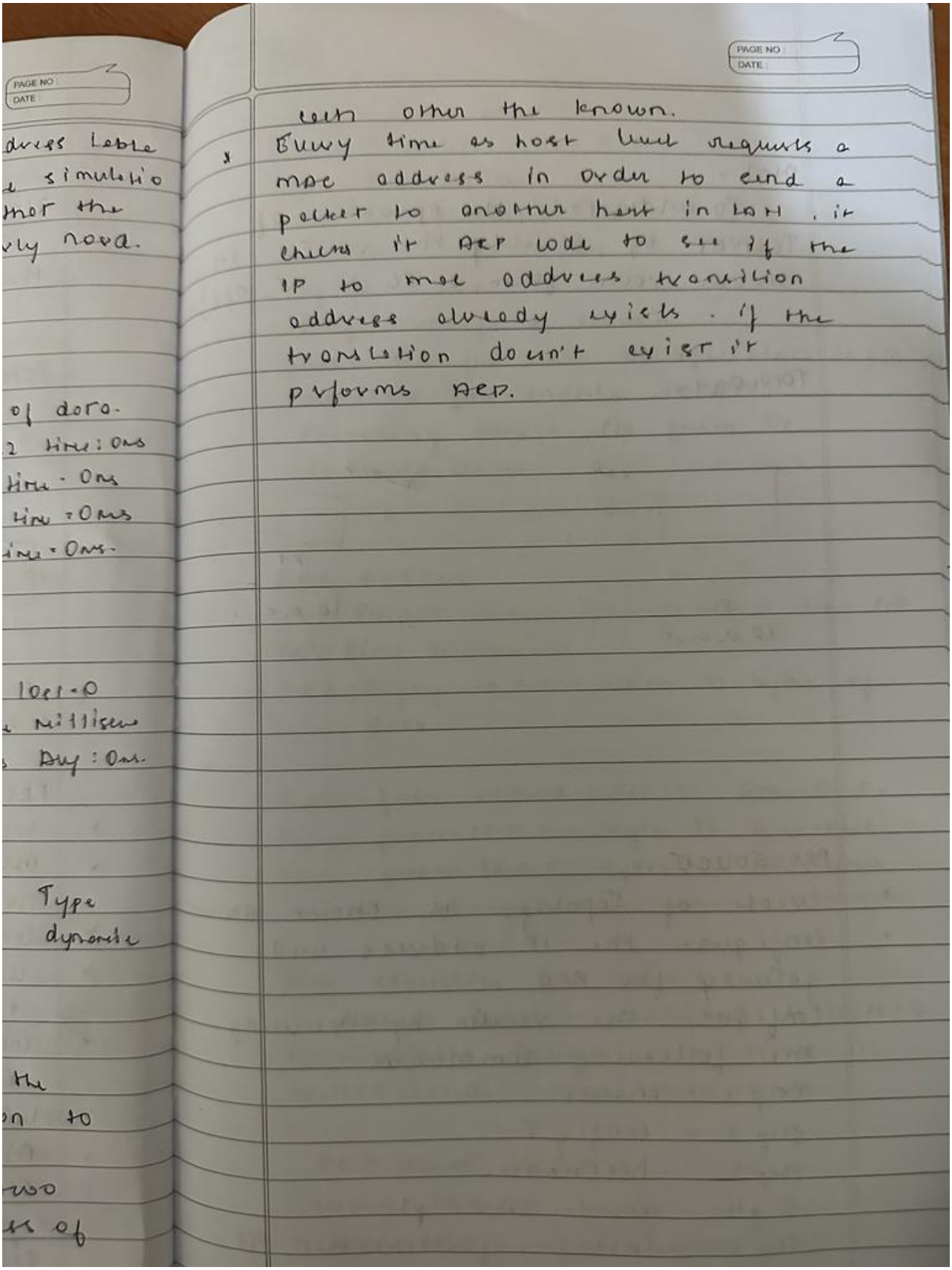
transaction & build the address table use the capture button in the simulation panel to go step by step so that the changes in PDU can be clearly noted.

PING OUTPUT

```
C:\> ping 10.0.0.4

Pinging 10.0.0.4 with 32 bytes of data:

Reply from 10.0.0.4: bytes=32 time=0ms
Reply from 10.0.0.4: bytes=32 time=0ms
Reply from 10.0.0.4: bytes=32 time=0ms
Reply from 10.0.0.4: bytes=32 time=0ms

Ping statistics for 10.0.0.4:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>arp -a

  Internet Address      Physical Address      Type
  10.0.0.4              0060.2f4d             dynamic
```

Observation -

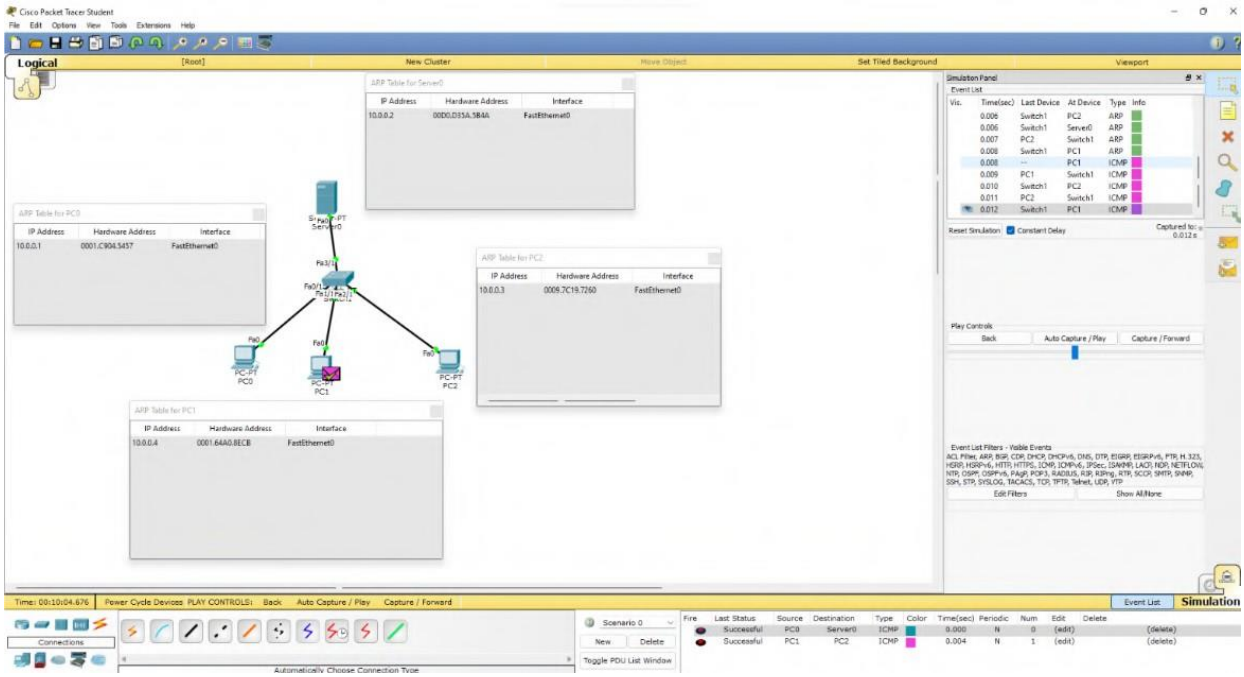
* When we ping 1 PC to server the address of server is known to PC & vice-versa.
* When we ping between other two PC simultaneously the address of

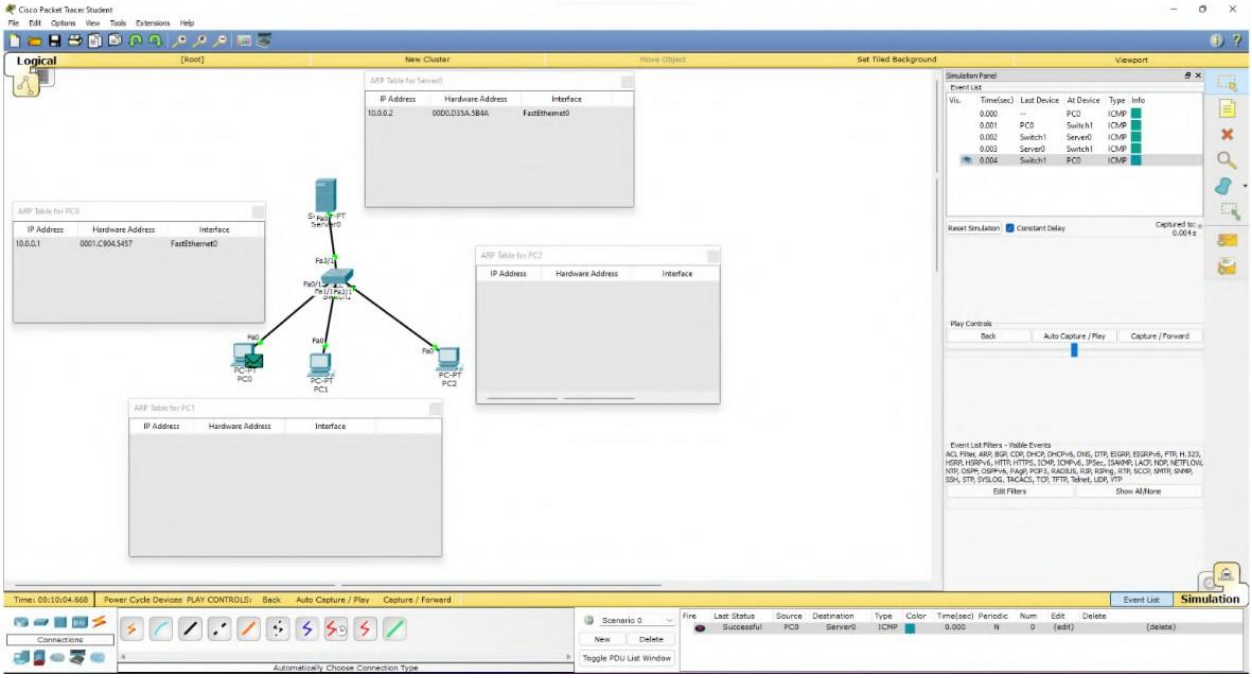


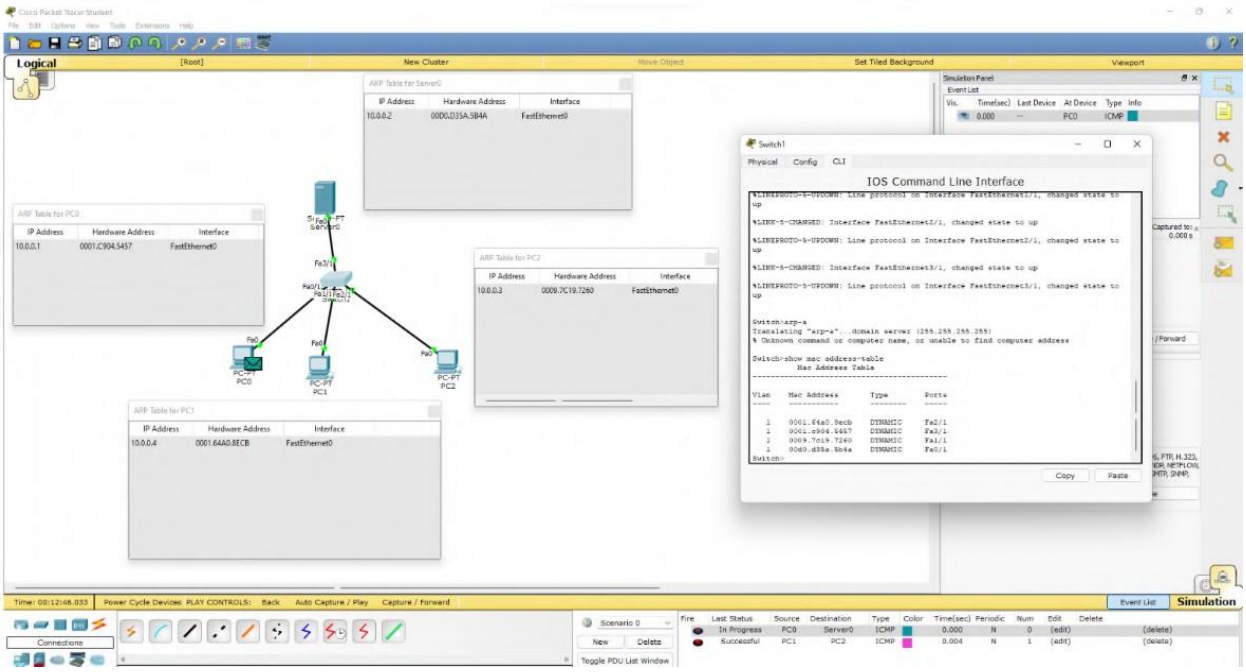
with other the known.
Every time a host that requires a mac address in order to send a packet to another host in LAN, it checks it ARP code to see if the IP to mac address translation address already exists. If the translation doesn't exist it performs ARP.

TOPOLOGY:

OUTPUT:



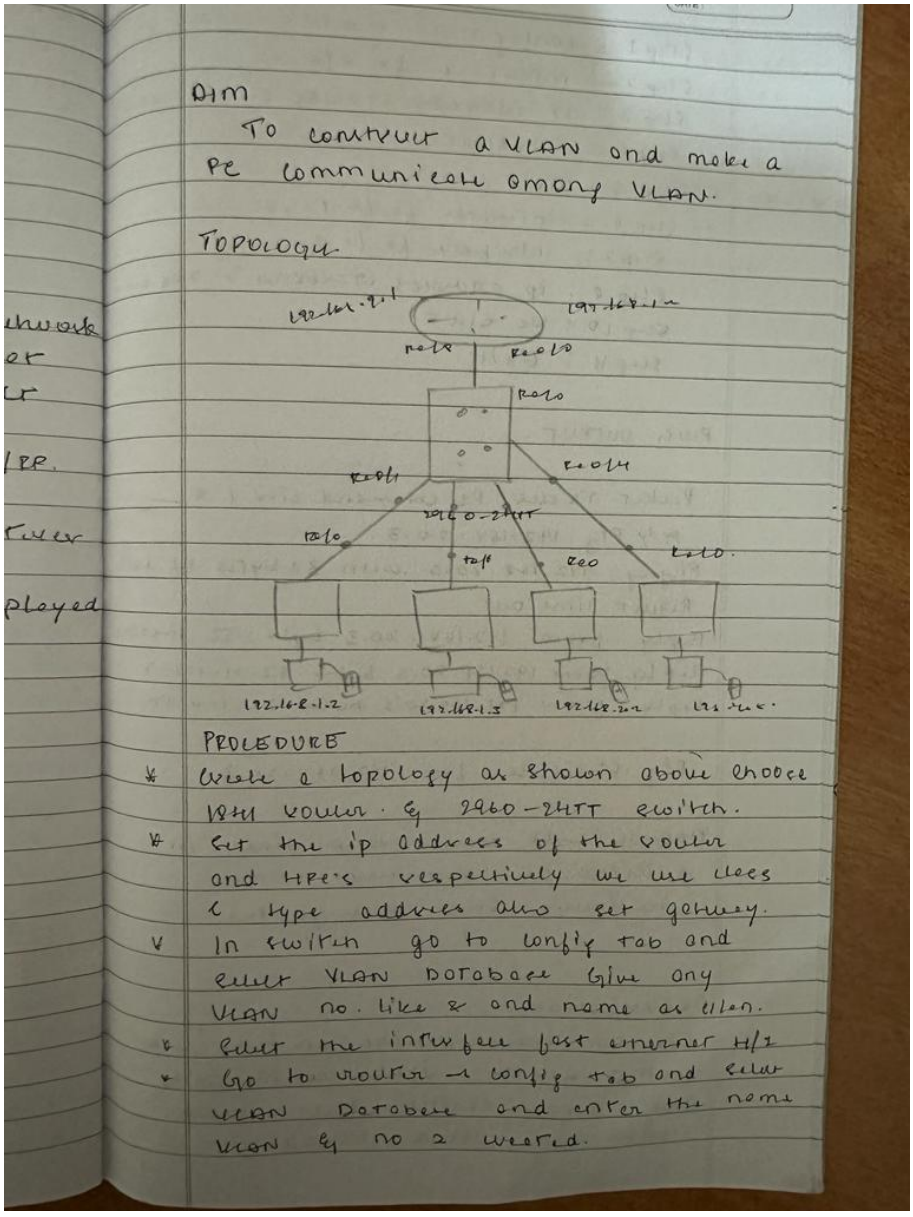



Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
ARP Table for Server0
IP Address
Hardware Address
Interface
10.0.0.2
00D0.D35A.5B4A
FastEthernet0
ARP Table for PC0
10.0.0.1
0001.C904.5457
FastEthernet0
ARP Table for PC2
10.0.0.3
0009.7C19.7260
FastEthernet0
ARP Table for PC1
10.0.0.4
0001.64A0.8ECB
FastEthernet0
Switch1
Physical
Config
CLI
IOS Command Line Interface
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet1/1, changed state to up
%LINK-5-CHANGED: Interface FastEthernet1/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet2/1, changed state to up
%LINK-5-CHANGED: Interface FastEthernet3/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet3/1, changed state to up
Switch>arp -a
Translating "arp-a"...domain server (255.255.255.255)
% Unknown command or computer name, or unable to find computer address
Switch>show mac address-table
Mac Address Table
Vlan Mac Address Type Ports
1 0001.64a0.8ecb DYNAMIC Fa2/1
1 0001.c904.5457 DYNAMIC Fa1/1
1 0009.7c19.7260 DYNAMIC Fa1/1
1 00d0.d35a.5b4a DYNAMIC Fa0/1
Switch>
Copy
Paste
Simulation Panel
Event List
Vis. Time(sec) Last Device At Device Type Info
0.000 -- PC0 ICMP
Time: 00:12:48.033
Power Cycle Devices PLAY CONTROLS: Back Auto Capture / Play Capture / Forward
Event List
Simulation
Connections
Scenario 0
New
Delete
Toggle PDU List Window
Fire Last Status Source Destination Type Color Time(sec) Periodic Num Edit Delete
In Progress PC0 Server0 ICMP 0.000 N 0 (edit) (delete)
Successful PC1 PC2 ICMP 0.004 N 1 (edit) (delete)

WEEK 9

To construct a VLAN and make a pc communicate among VLAN.

OBSERVATION:



AIM

To construct a VLAN and make a PC communicate among VLAN.

TOPOLOGY

PROCEDURE

* Create a topology as shown above choose 1841 router & 2960-24TT switch.
* Set the ip address of the router and PC's respectively we use class C type address also set gateway.
* In switch go to config tab and select VLAN Database Give any VLAN no. like 2 and name as vlan.
* Select the interface fast ethernet 0/1
* Go to router → config tab and select VLAN Database and enter the name VLAN & no 2 created.

Step 1 : Config T
Step 2 : interface fa 0/0
Step 3 : IP address 192.168.1.1 255.255.0.
Step 4 : NO shut
Step 5 : Exit.
Step 6 : interface fa 1/0
Step 7 : interface fa 1/1
Step 8 : ip address 192.168.20.2 255.0.0.0
Step 10 : No shut
Step 11 : Exit.

PING OUTPUT.

Packet Tracer PC command line 1.0
PC> Ping 192.168.20.3.
Pinging 192.168.20.3 with 32 bytes of data.
Request time out.
Reply from 192.168.20.3 byte : 32 time=0ms.
Reply from 192.168.20.3 byte : 32 time=0ms
Reply from 192.168.20.3 byte 32 time=0ms

Ping statistics for 192.168.20.3

Approximate round trip time in milliseconds. Minimum =0ms
Maximum = 1ms Average = 1ms.

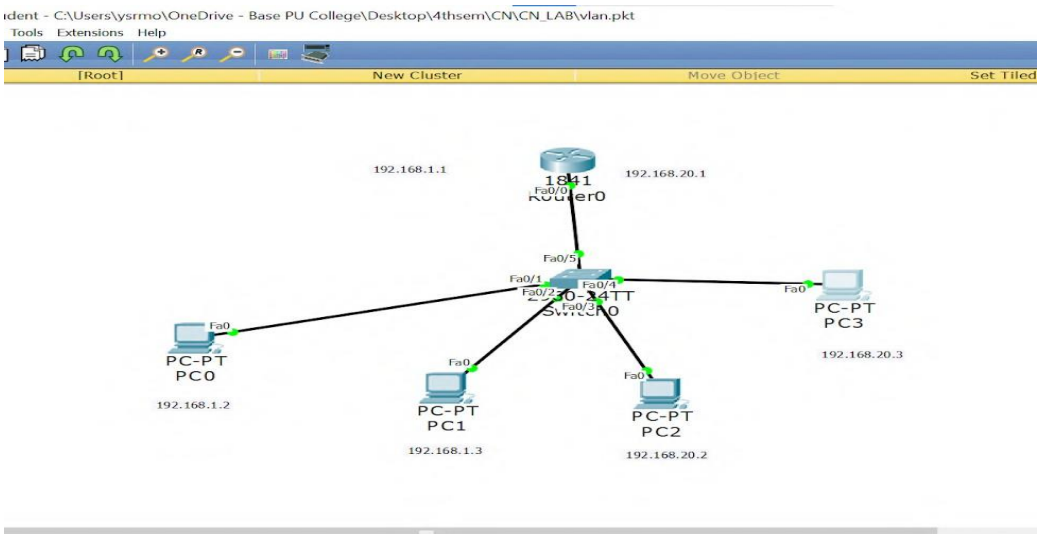
Observation.

* We can move device on one VLAN another another VLAN connected to the same switch they work only near other broadcast

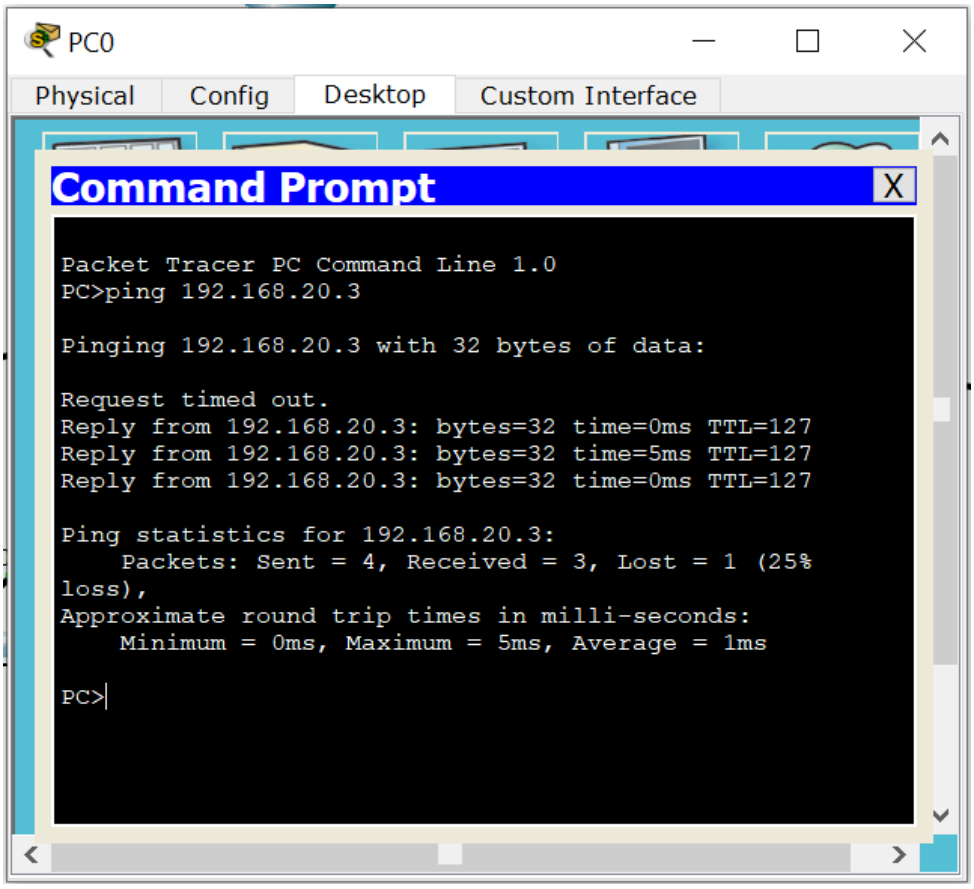
PAGE NO.
DATE

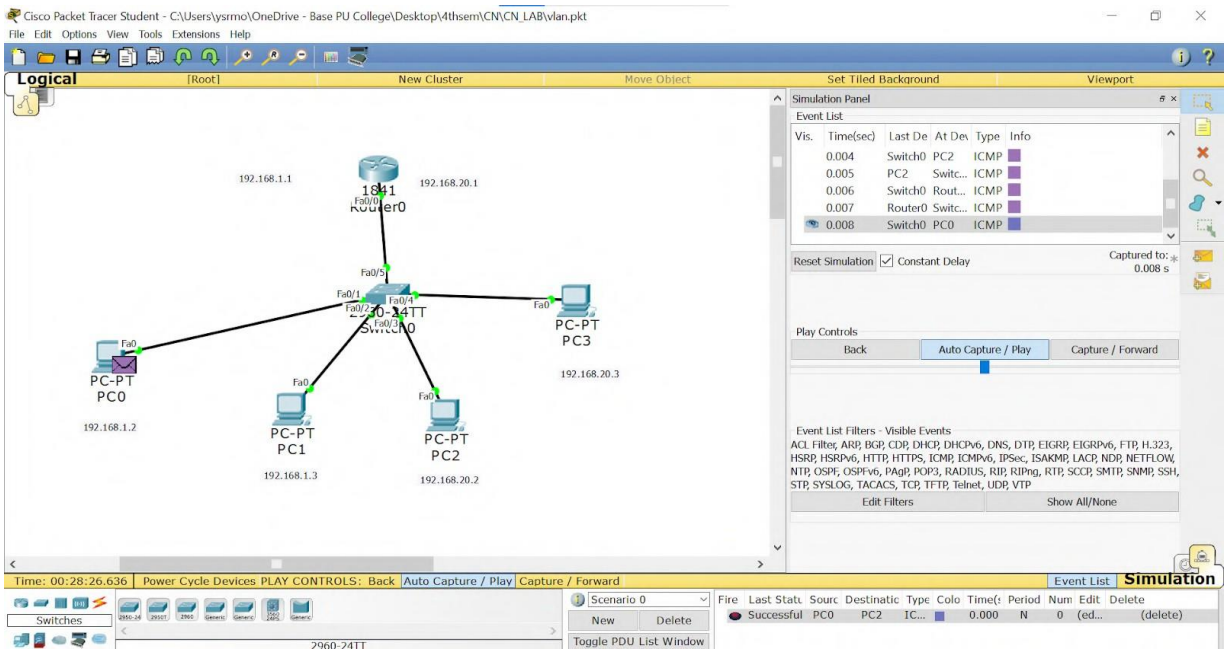
- Here VLAN doesn't use IP address instead deal with subnet / class C type address.
- Inter VLAN routing gives a flexible tool to logically subdivides their network that has potential to enhance security & performance.

TOPOLOGY:


ident - C:\Users\ysrmo\OneDrive - Base PU College\Desktop\4thsem\CN\CN_LAB\vlan.pkt
Tools Extensions Help
[Root]
New Cluster
Move Object
Set Tiled
192.168.1.1
192.168.20.1
Fa0/5
Fa0/1
Fa0/4
Fa0
PC-PT
PC3
192.168.20.3
Fa0
PC-PT
PC0
192.168.1.2
Fa0
PC-PT
PC1
192.168.1.3
Fa0
PC-PT
PC2
192.168.20.2

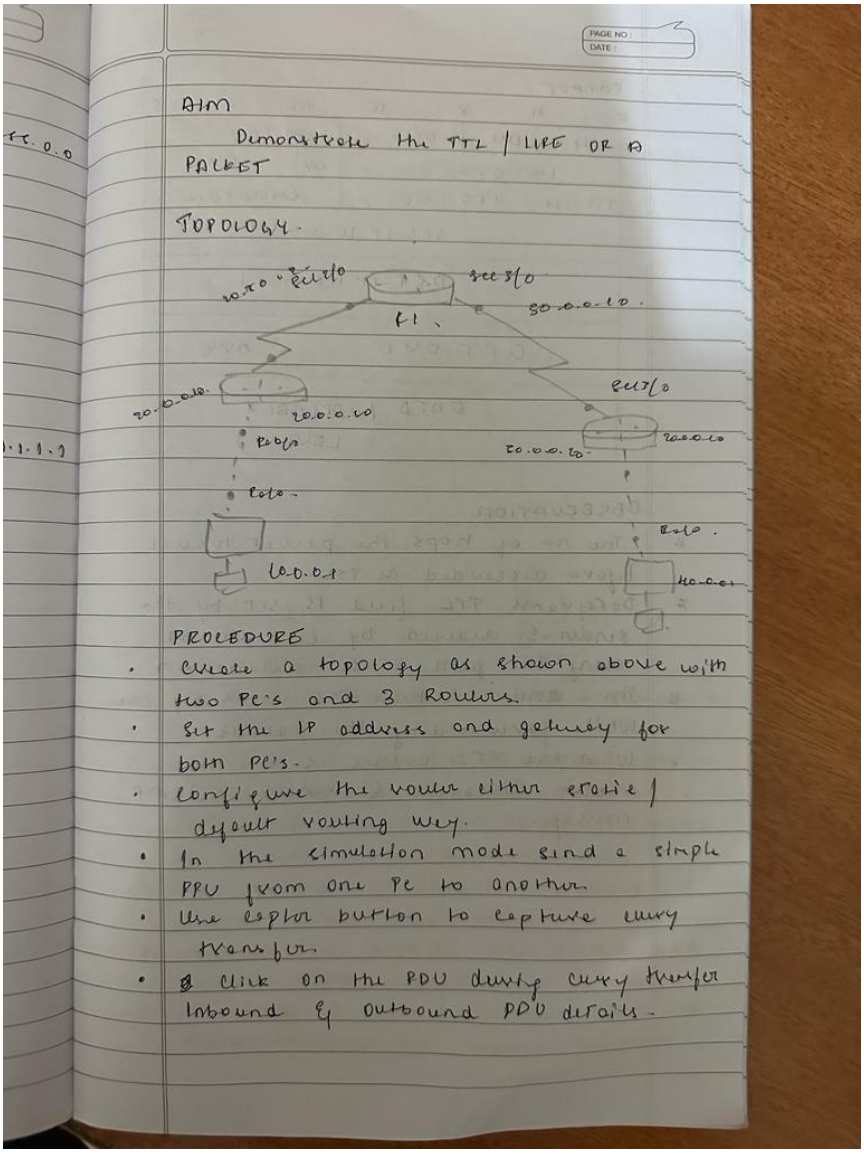
OUTPUT:


PC0
Physical
Config
Desktop
Custom Interface
Command Prompt
X
Packet Tracer PC Command Line 1.0
PC>ping 192.168.20.3
Pinging 192.168.20.3 with 32 bytes of data:
Request timed out.
Reply from 192.168.20.3: bytes=32 time=0ms TTL=127
Reply from 192.168.20.3: bytes=32 time=5ms TTL=127
Reply from 192.168.20.3: bytes=32 time=0ms TTL=127
Ping statistics for 192.168.20.3:
Packets: Sent = 4, Received = 3, Lost = 1 (25%
loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 5ms, Average = 1ms
PC>


Logical
PC-PT PC0
PC-PT PC1
PC-PT PC2
PC-PT PC3
192.168.1.1
192.168.20.1
192.168.1.2
192.168.1.3
192.168.20.2
192.168.20.3
Simulation Panel
Event List
Play Controls
Back
Auto Capture / Play
Capture / Forward
Simulation

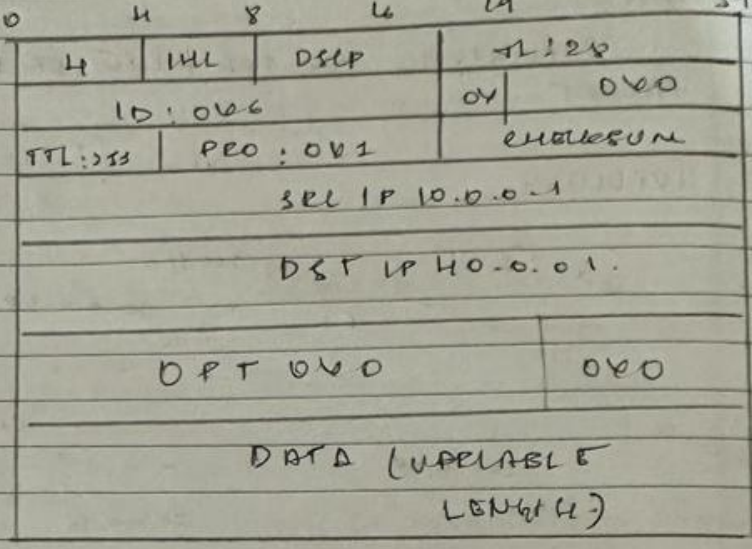
WEEK 10

Demonstrate the TTL/ Life of a Packet.OBSERVATION



:

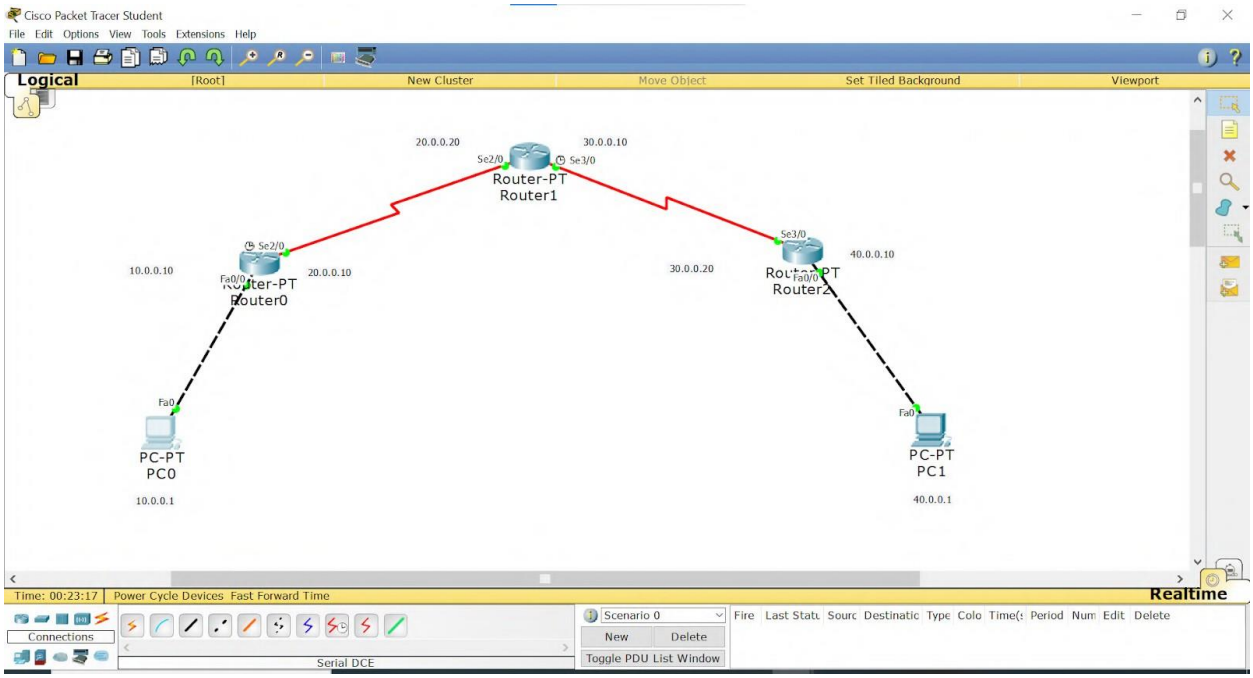
OUTPUT.



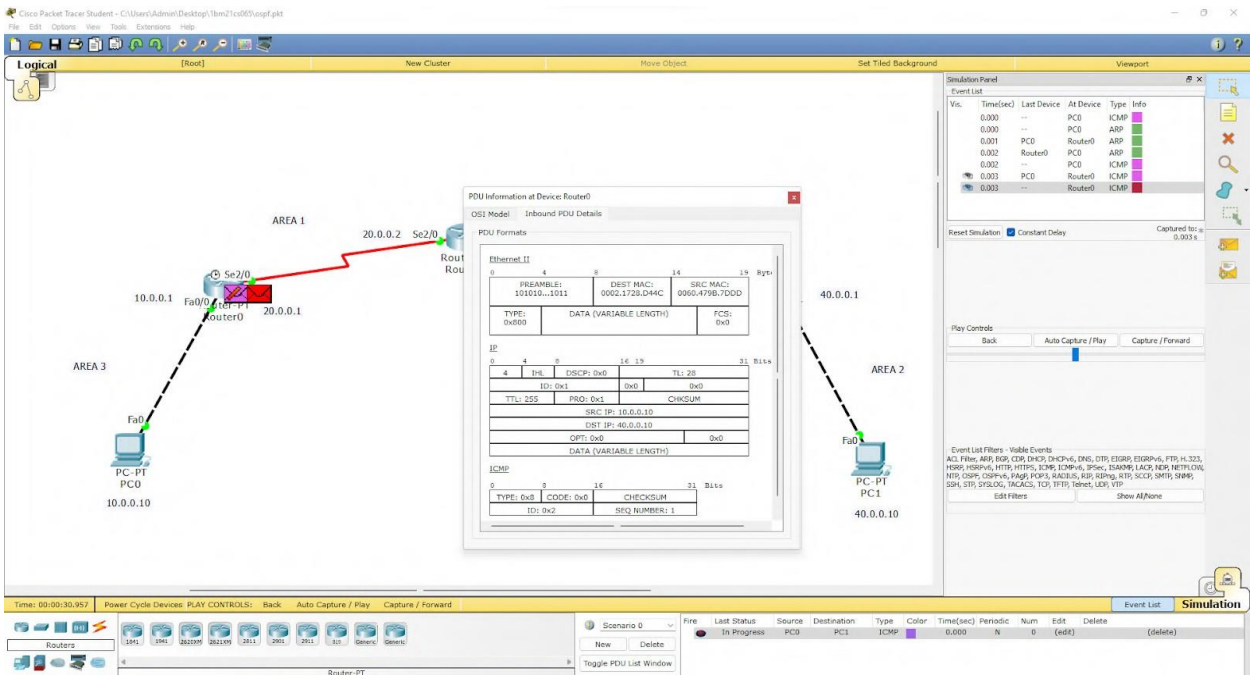
OBSERVATION.

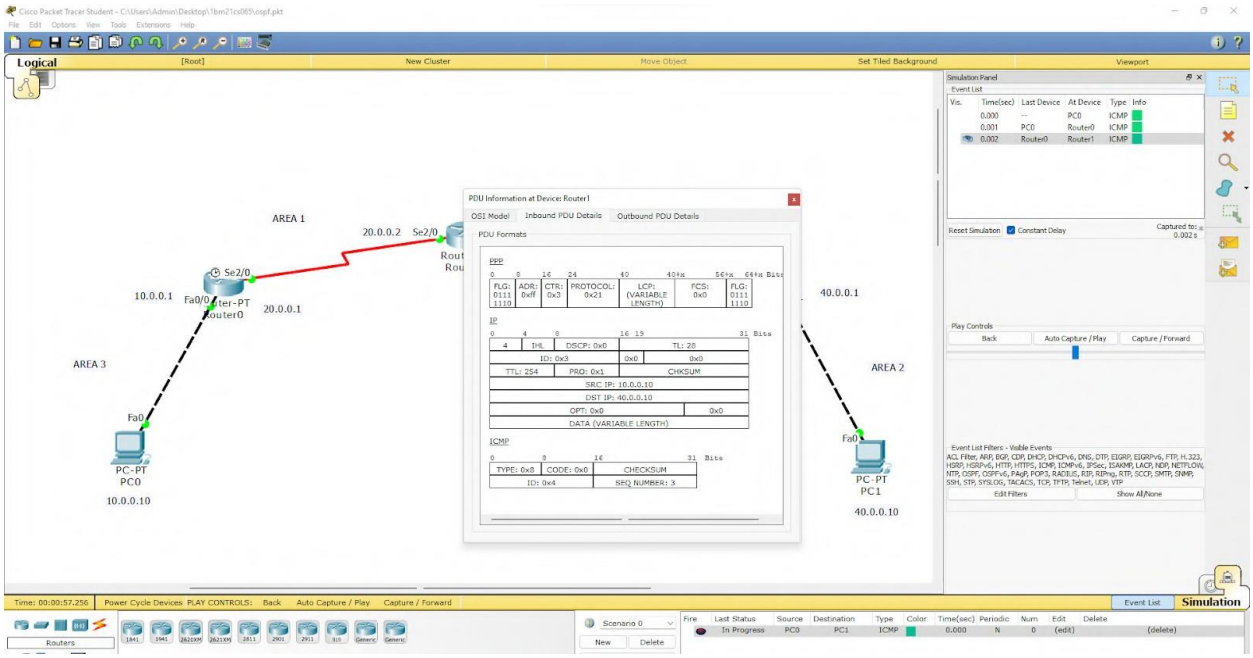
- The no of hops the packet travel before discarded as TTL.
- Datagram TTL field is set by the sender & reduced by each router along the path to its destination.
- The router reduces TTL value by one while forwarding the packets.
- When the TTL value is 0, the router discards & sends an ICMP message

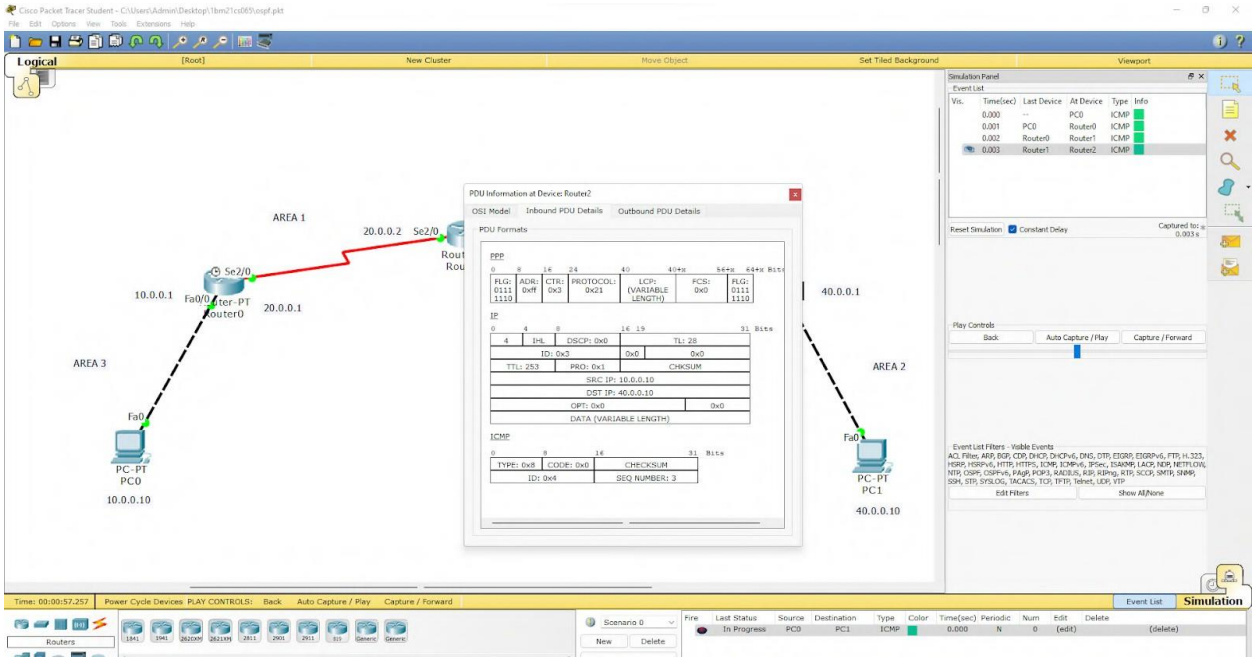
TOPOLOGY:

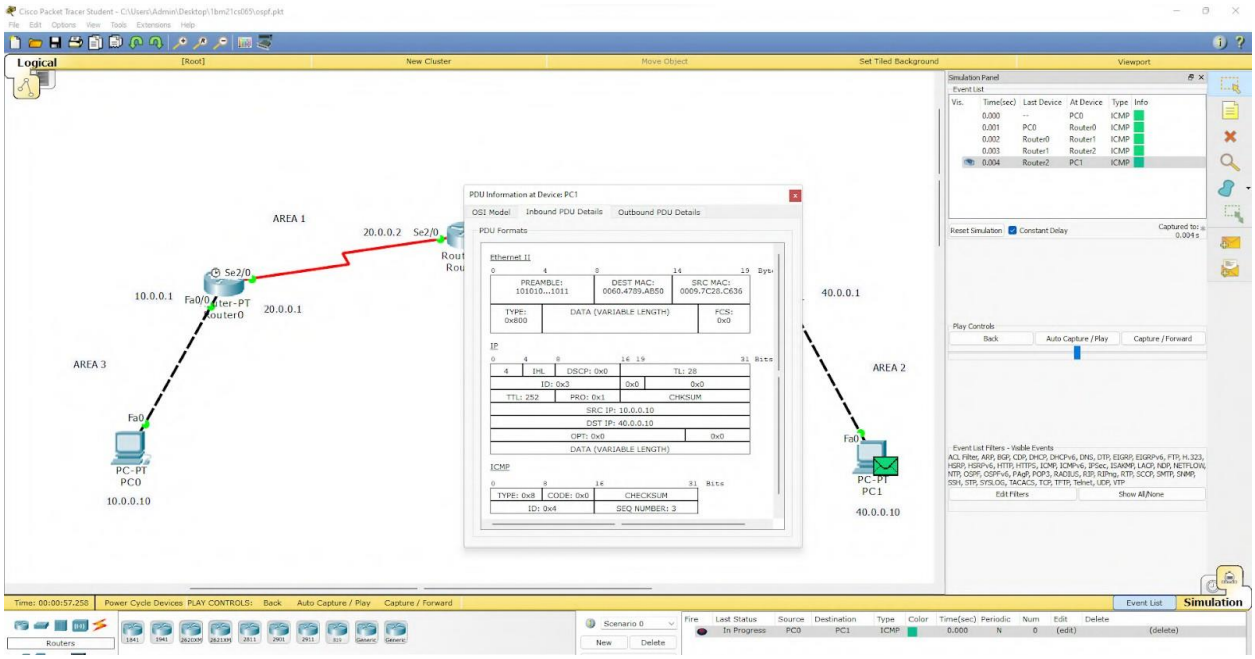


OUTPUT:




Logical
AREA 1
20.0.0.2
Se2/0
10.0.0.1
Fa0/0
20.0.0.1
AREA 3
AREA 2
40.0.0.1
Fa0
PC-PT
PC0
10.0.0.10
PC-PT
PC1
40.0.0.10
PDU Information at Device: Router1
OSI Model
Inbound PDU Details
Outbound PDU Details
PDU Formats
PPP
IP
ICMP
SRC IP: 10.0.0.10
DST IP: 40.0.0.10
DATA (VARIABLE LENGTH)
Simulation Panel
Event List
Play Controls
Back
Auto Capture / Play
Capture / Forward
Time: 00:00:57.256
Power Cycle Devices
PLAY CONTROLS:
Simulation

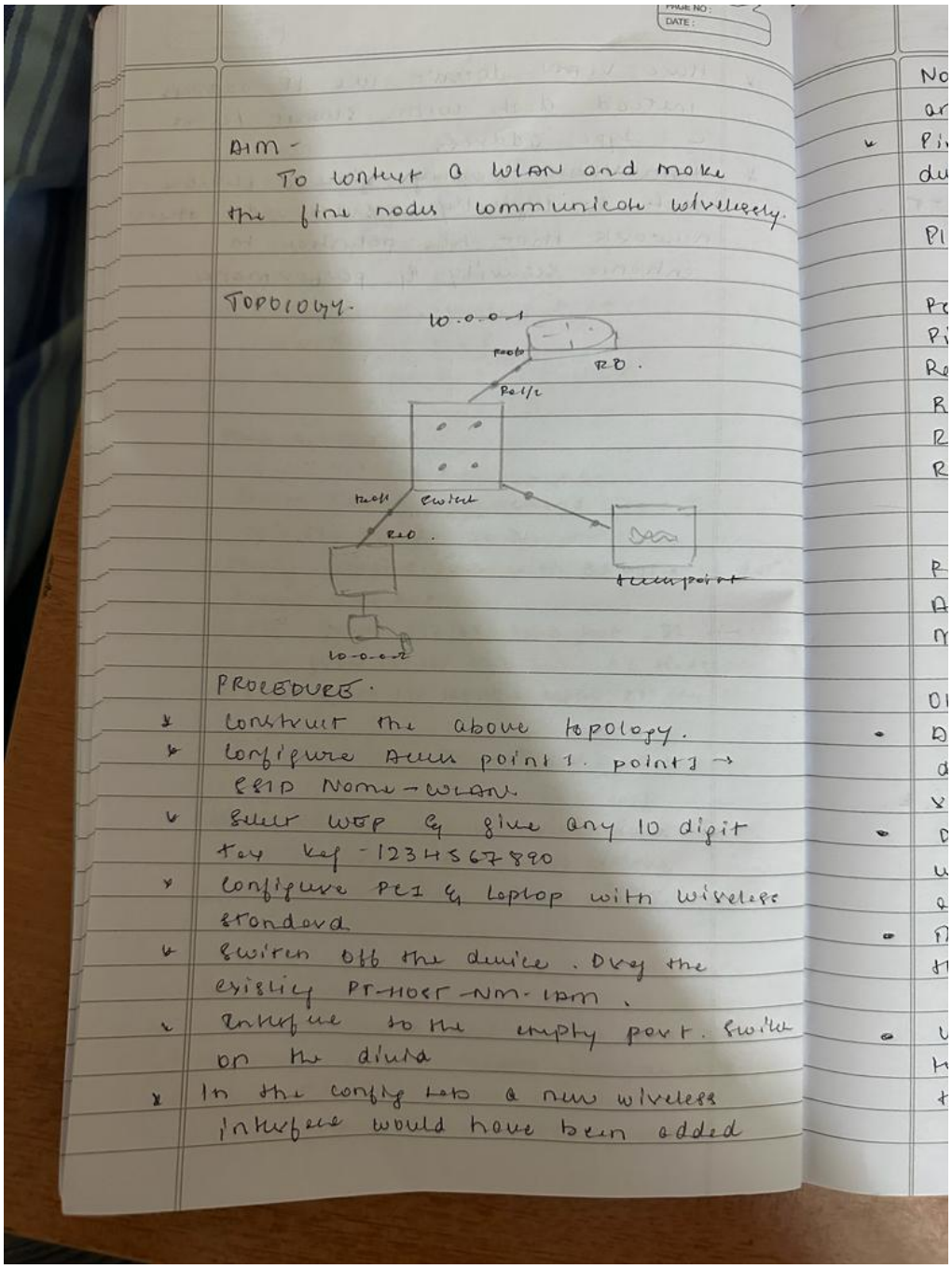

Logical
AREA 1
20.0.0.2
Se2/0
10.0.0.1
Fa0/0
20.0.0.1
AREA 3
AREA 2
40.0.0.1
Fa0
PC-PT
PC0
10.0.0.10
PC-PT
PC1
40.0.0.10
PDU Information at Device: Router2
OSI Model
Inbound PDU Details
Outbound PDU Details
PDU Formats
PPP
IP
ICMP
SRC IP: 10.0.0.10
DST IP: 40.0.0.10
DATA (VARIABLE LENGTH)
Simulation Panel
Event List
Play Controls
Back
Auto Capture / Play
Capture / Forward
Time: 00:00:57.257
Power Cycle Devices
PLAY CONTROLS:
Simulation


Logical
AREA 1
20.0.0.2
Se2/0
10.0.0.1
Fa0/0
Router-PT
Router0
20.0.0.1
AREA 3
Fa0
PC-PT
PC0
10.0.0.10
40.0.0.1
AREA 2
Fa0
PC-PT
PC1
40.0.0.10
PDU Information at Device: PC1
OSI Model
Inbound PDU Details
Outbound PDU Details
PDU Formats
Ethernet II
PREAMBLE: 101010...1011
DEST MAC: 0060.4789.AB50
SRC MAC: 0009.7C28.C636
TYPE: 0x800
DATA (VARIABLE LENGTH)
FCS: 0x0
IP
IHL
DSCP: 0x0
TL: 28
ID: 0x3
TTL: 252
PRO: 0x1
CHKSUM
SRC IP: 10.0.0.10
DST IP: 40.0.0.10
OPT: 0x0
DATA (VARIABLE LENGTH)
ICMP
TYPE: 0x8
CODE: 0x0
CHECKSUM
ID: 0x4
SEQ NUMBER: 3
Simulation Panel
Event List
Play Controls
Back
Auto Capture / Play
Capture / Forward
Event List Filters - Visible Events
Edit Filters
Show All/None
Power Cycle Devices
PLAY CONTROLS:
Event List
Simulation
Routers
Scenario 0
New
Delete
In Progress
PC0
PC1
ICMP

WEEK 11

To construct a WLAN and make the nodes communicate wirelessly

OBSERVATION:



Now configure SSID, WEP key. IP address and gateway to the device.

- Ping from every device to every other device.

PING OUTPUT.

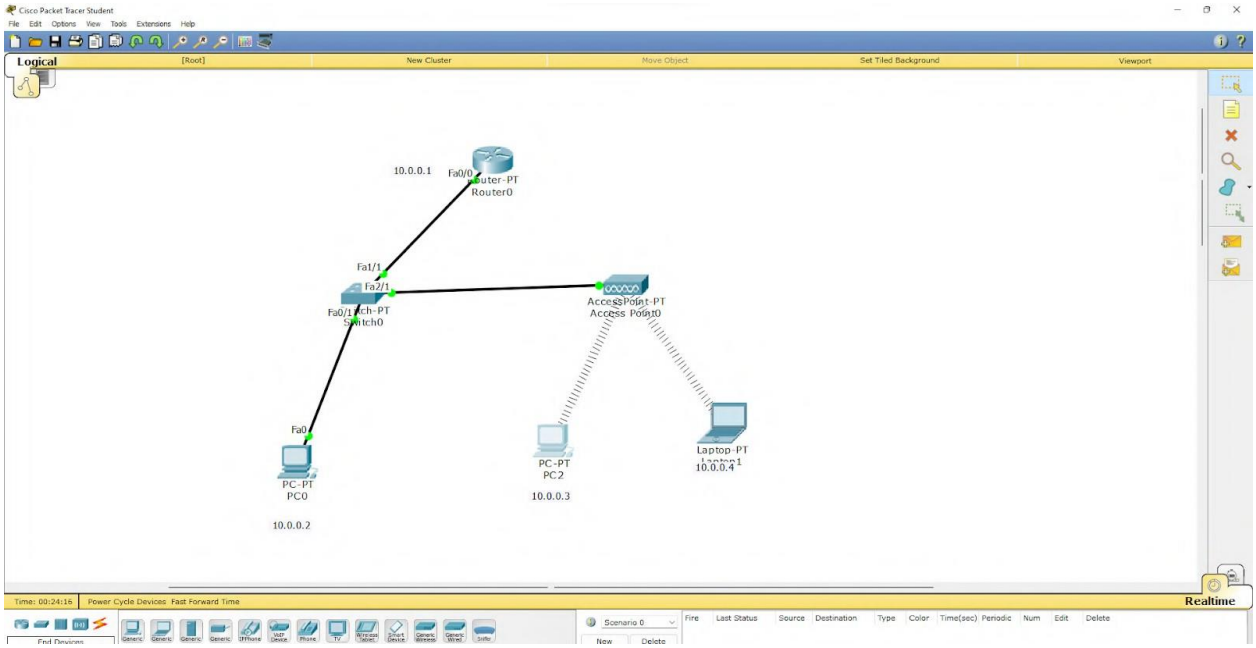
Packet Tracer PC command line 10.
PC> Ping 10.0.0.3.
Pinging 10.0.0.3 with 32 bytes of data.
Request time out.
Reply from 10.0.0.3 bytes 32 time=0ms
Reply from 10.0.0.3 bytes 32 time=0ms.
Reply from 10.0.0.3 bytes 32 time 0ms.

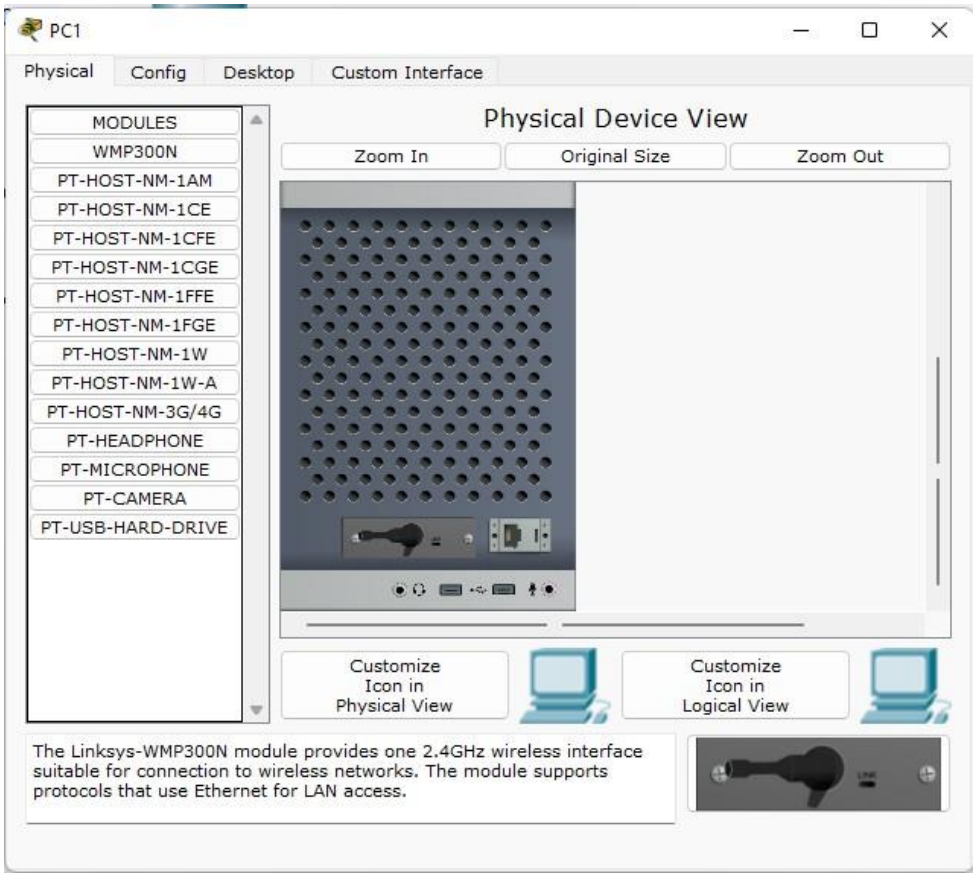
Ping statistics for 10.0.0.3.
Packets: Sent=4 Received=3 Lost=1.
Approximate round trip times milliseconds
Minimum=0ms Maximum=1ms Avg=0ms.

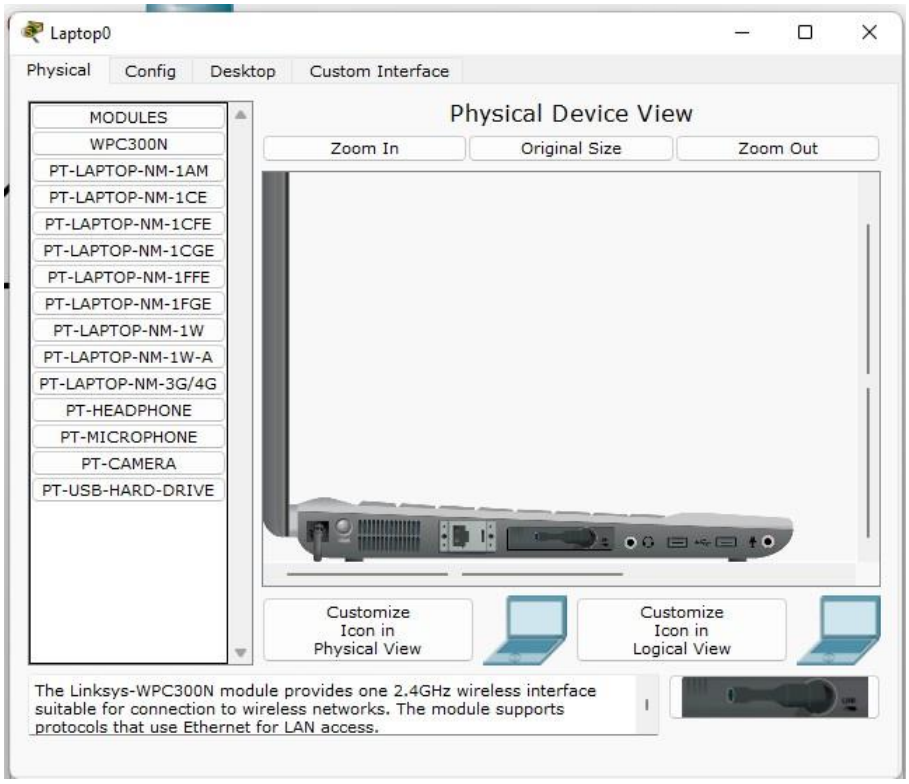
Observation.

- A WLAN is a group of connected devices that forms network based on radio transmissions.
- Data sent in packets contain layer with labels & instructions. MAC address to endpoint for routing.
- The access point is the base solution that serves as a hub at which other station.
- With one access point we can connect to multiple devices wirelessly & transmit data.

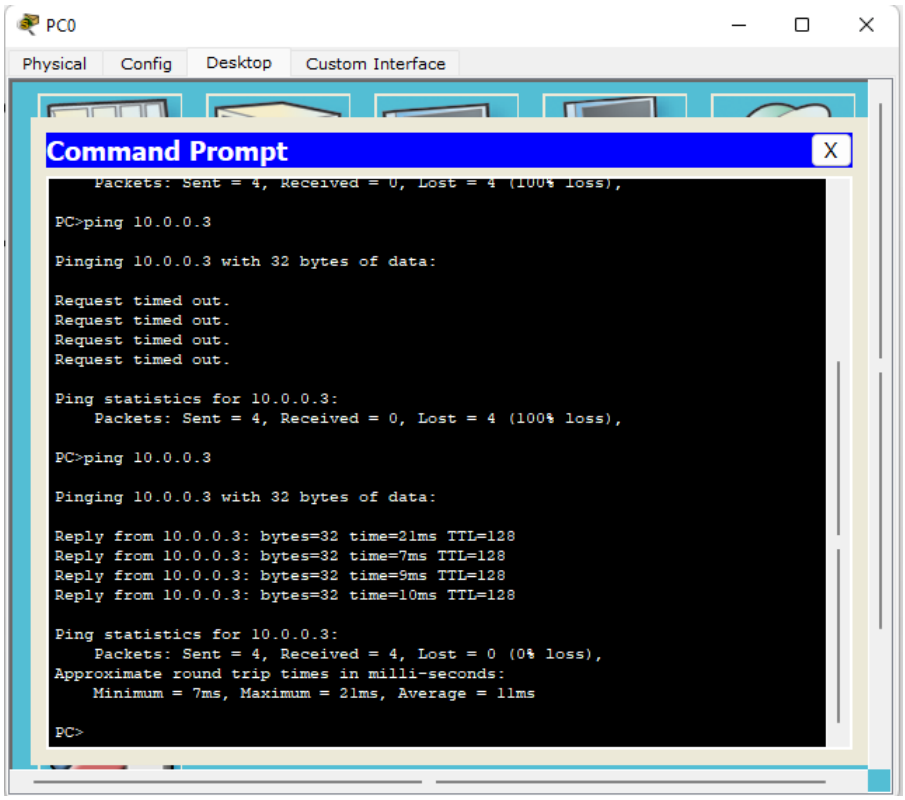
TOPOLOGY:


Logical
10.0.0.1
Fa0/0
Router-PT
Router0
Fa1/1
Fa2/1
Fa0/1
Switch0
Access Point-PT
Access Point0
Fa0
PC-PT
PC0
10.0.0.2
PC-PT
PC2
10.0.0.3
Laptop-PT
10.0.0.4
Realtime


PC1
Physical
Config
Desktop
Custom Interface
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-3G/4G
PT-HEADPHONE
PT-MICROPHONE
PT-CAMERA
PT-USB-HARD-DRIVE
Physical Device View
Zoom In
Original Size
Zoom Out
Customize Icon in Physical View
Customize Icon in Logical View
The Linksys-WMP300N module provides one 2.4GHz wireless interface suitable for connection to wireless networks. The module supports protocols that use Ethernet for LAN access.


Laptop0
Physical
Config
Desktop
Custom Interface
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-3G/4G
PT-HEADPHONE
PT-MICROPHONE
PT-CAMERA
PT-USB-HARD-DRIVE
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 networks. The module supports protocols that use Ethernet for LAN access.

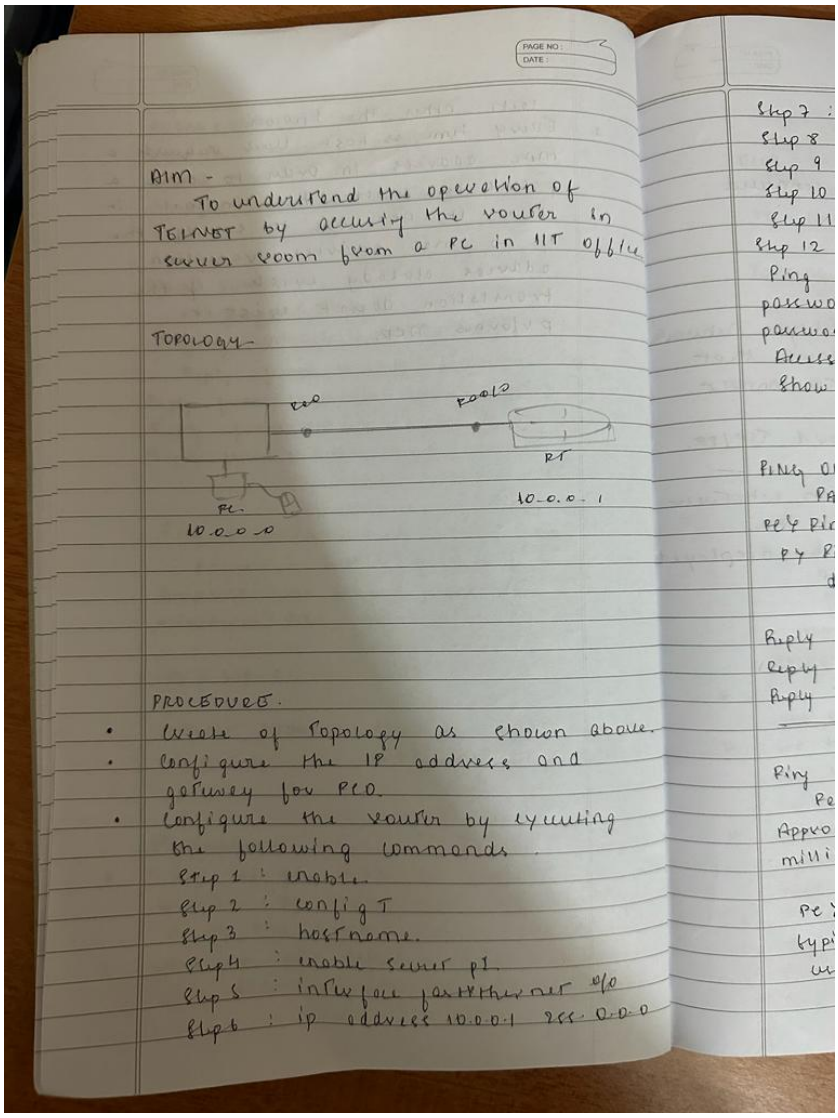
OUTPUT:


PC0
Physical
Config
Desktop
Custom Interface
Command Prompt
X
Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
PC>ping 10.0.0.3
Pinging 10.0.0.3 with 32 bytes of data:
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Ping statistics for 10.0.0.3:
Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
PC>ping 10.0.0.3
Pinging 10.0.0.3 with 32 bytes of data:
Reply from 10.0.0.3: bytes=32 time=21ms TTL=128
Reply from 10.0.0.3: bytes=32 time=7ms TTL=128
Reply from 10.0.0.3: bytes=32 time=9ms TTL=128
Reply from 10.0.0.3: bytes=32 time=10ms TTL=128
Ping statistics for 10.0.0.3:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 7ms, Maximum = 21ms, Average = 11ms
PC>

WEEK 12

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

OBSERVATION:



Step 7 : No shor
Step 8 : line vty 0 5.
Step 9 : log in
Step 10 : password p0.
Step 11 : Exit Exit
Step 12 : wr.
Ping message to router.
password for user verification is p1o.
password for enable is p1.
Accessing router cli from Pc
Show ip route.

PING OUTPUT
PACKET from Pc command line 4.0.
Pc> Ping 10.0.0.1.
Pinging 10.0.0.1 with 32 bytes of data.

Reply from 10.0.0.1 bytes:32 time=0ms.
Reply from 10.0.0.1 : bytes=32 time=0ms.
Reply from 10.0.0.1 bytes: 32 time=0ms.

Ping statistics for 10.0.0.1.
Packets sent = 4. Received = 4 lost = 0
Approximate round trip times in milliseconds, one way = 0ms.

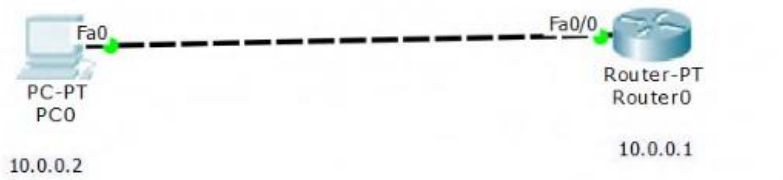
Pc> telnet 10.0.0.1
typing 10.0.0.1 open
user Access Verification

Password : P1.
R1 # show ip route.
:
e. 10.0.0.0/8 directly connected
fast Ethernet 0/0.

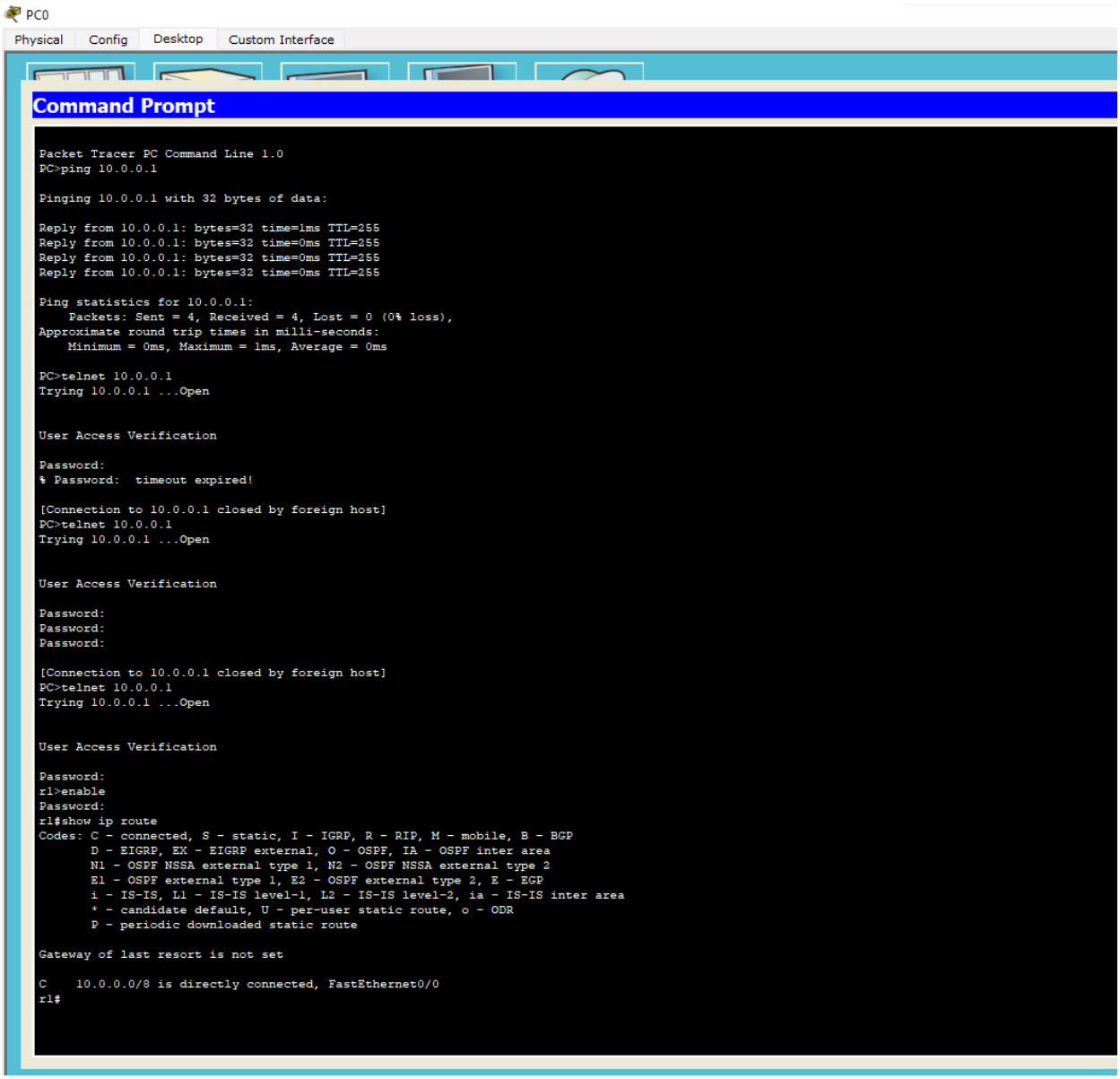
OBSERVATION-

* TELNET stands for Teletype network. It is a type of protocol that enables one computer to connect to the local computer.
* It is used a standard TCP/IP protocol by ISO.
During TELNET operation, whatever is being performed on the remote computer will be displayed by the local computer.

TOPOLOGY:



OUTPUT:


PC0
Physical
Config
Desktop
Custom Interface
Command Prompt
Packet Tracer PC Command Line 1.0
PC>ping 10.0.0.1
Pinging 10.0.0.1 with 32 bytes of data:
Reply from 10.0.0.1: bytes=32 time=1ms TTL=255
Reply from 10.0.0.1: bytes=32 time=0ms TTL=255
Reply from 10.0.0.1: bytes=32 time=0ms TTL=255
Reply from 10.0.0.1: bytes=32 time=0ms TTL=255
Ping statistics for 10.0.0.1:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 1ms, Average = 0ms
PC>telnet 10.0.0.1
Trying 10.0.0.1 ...Open
User Access Verification
Password:
% Password: timeout expired!
[Connection to 10.0.0.1 closed by foreign host]
PC>telnet 10.0.0.1
Trying 10.0.0.1 ...Open
User Access Verification
Password:
Password:
Password:
[Connection to 10.0.0.1 closed by foreign host]
PC>telnet 10.0.0.1
Trying 10.0.0.1 ...Open
User Access Verification
Password:
rl>enable
Password:
rl#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
rl#

WEEK 13

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

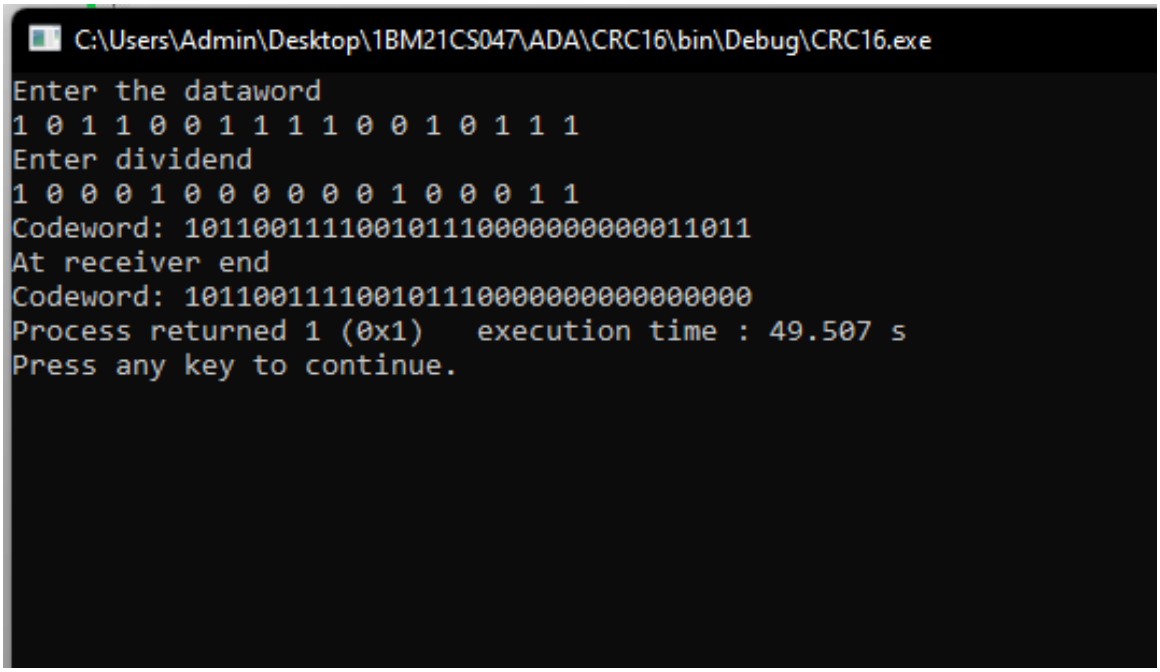
CODE:

```
#include<stdio.h>
int arr[17];

void xor(int x[], int y[])
{
   int k=0;
   for(int i=1;i<16;i++)
   {
      if(x[i]==y[i])
         arr[k++]=0;
      else
         arr[i]=1;
   }
}

void main()
{
   int dd[17],div[33],ze[17],i,k;

   printf("Enter the dataword \n");
   for(i=0;i<17;i++)
      scanf("%d",&div[i]);

   for(i=i;i<33;i++)
      div[i]=0;

   for(i=0;i<17;i++)
      ze[i]=0;
   printf("Enter dividend \n");
```

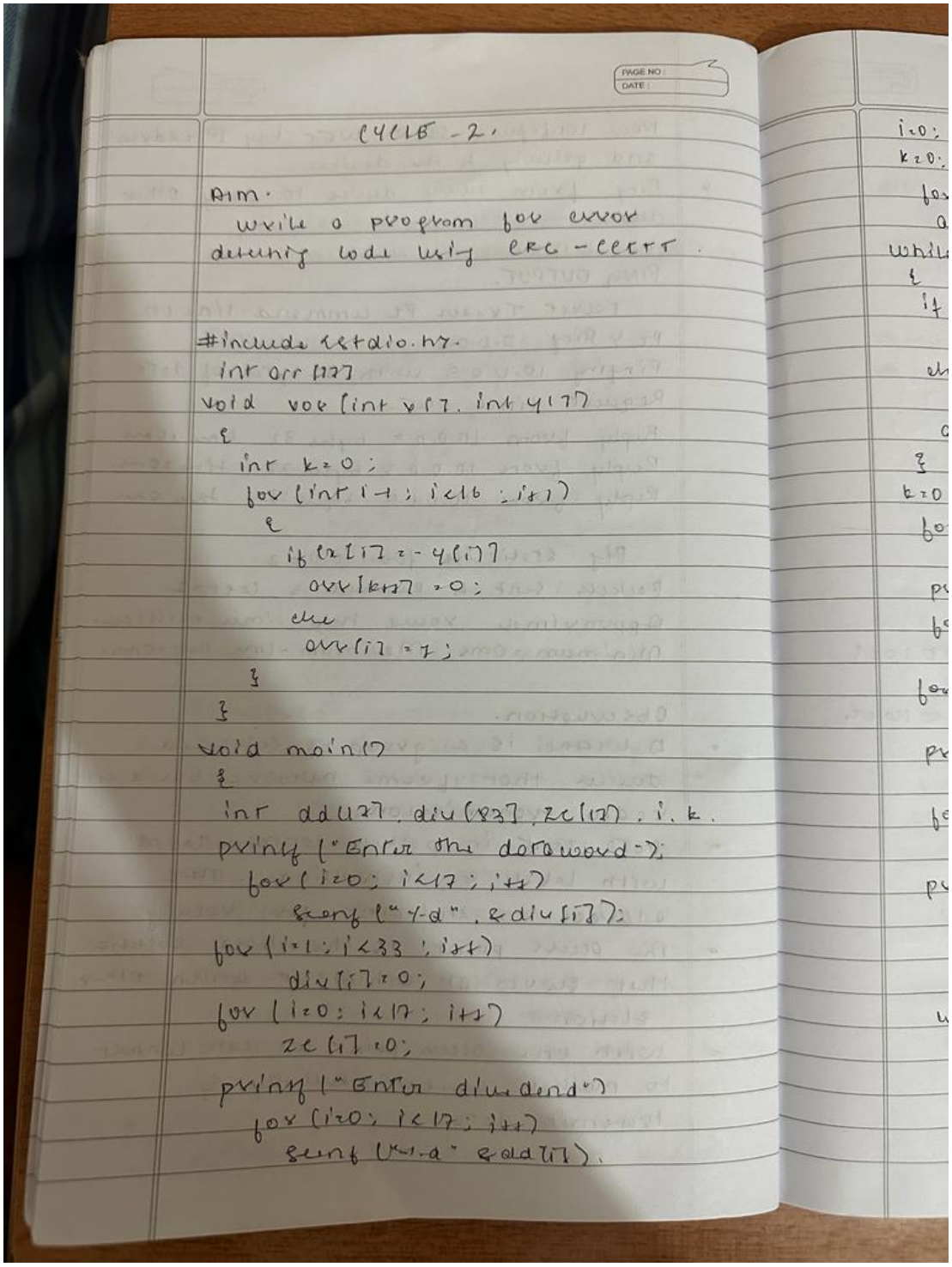
```
for(i=0;i<17;i++)
   scanf("%d",&dd[i]);

i=0;
k=0;
   for(i=i;i<17;i++)
      arr[k++]=div[i];
while(i<33)
{
   if(arr[0]==0)
      xor(arr,ze);
   else
      xor(arr,dd);

   arr[16]=div[i++];

}
k=0;
for(i=17;i<33;i++)
   div[i]=arr[k++];
printf("Codeword: ");
   for(i=0;i<33;i++)
      printf("%d",div[i]);

for(i=0;i<17;i++)
   arr[i]=0;

printf("\nAt receiver end \n");

 k=0;
   for(i=i;i<17;i++)
      arr[k++]=div[i];
while(i<33)
{
```

```
        if(arr[0]==0)
            xor(arr,ze);
        else
            xor(arr,dd);

        arr[16]=div[i++];

    }
    k=0;
    for(i=17;i<33;i++)
        div[i]=arr[k++];

    printf("Codeword: ");
        for(i=0;i<33;i++)
            printf("%d",div[i]);
}
```

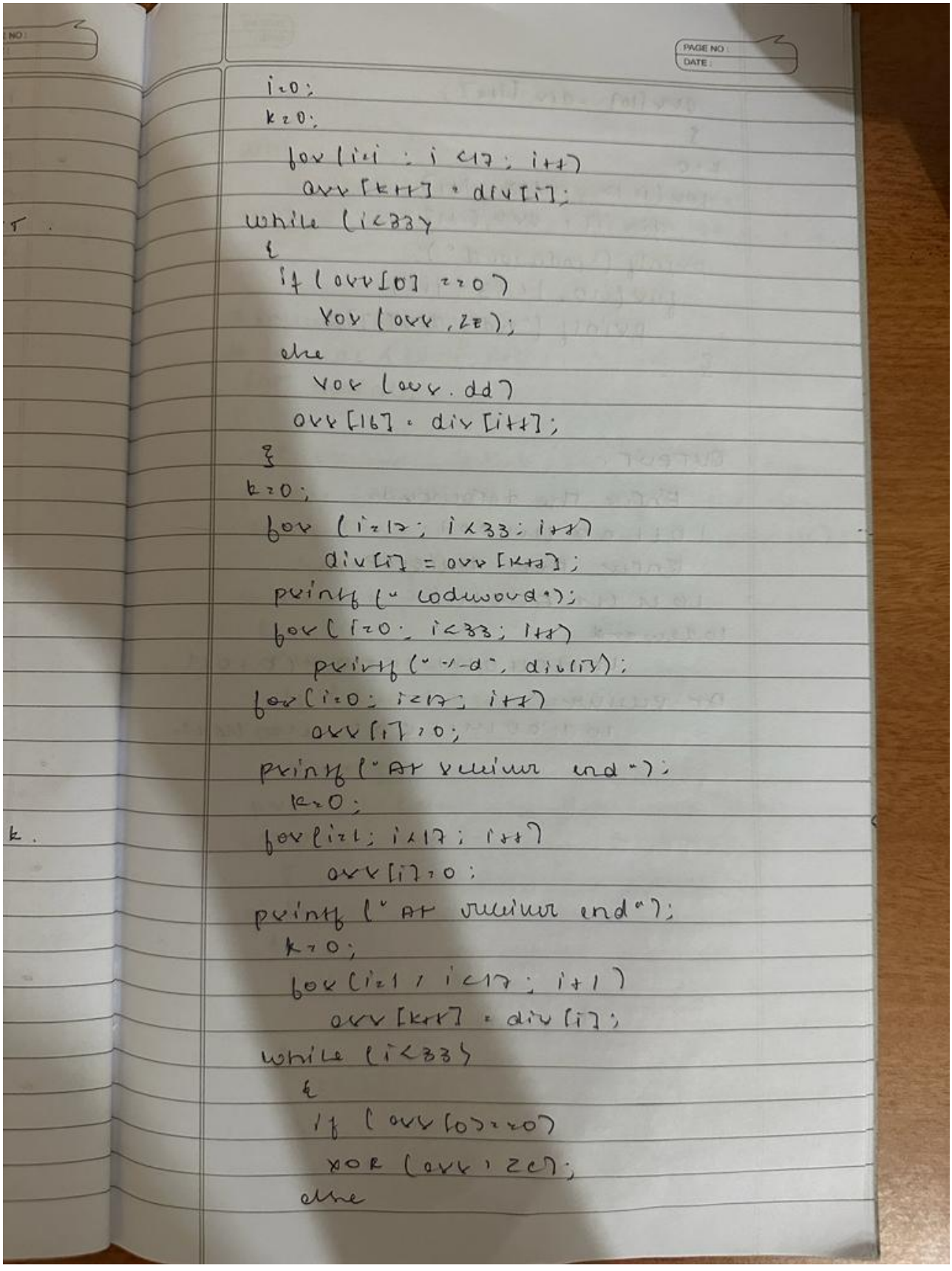
OUTPUT:



OBSERVATION:



```
CYCLE - 2.

Aim.
  write a program for error
detecting code using CRC - CCITT.

#include <stdio.h>
int a[17]
void xor(int x[17], int y[17])
{
  int k=0;
  for(int i=1; i<16; i++)
  {
    if(x[i] == y[i])
      a[k++] = 0;
    else
      a[k++] = 1;
  }
}
void main()
{
  int dd[17], div[33], z[17], i, k.
  printf("Enter the dataword:");
    for(i=0; i<17; i++)
      scanf("%d", &div[i]);
  for(i=1; i<33; i++)
    div[i] = 0;
  for(i=0; i<17; i++)
    z[i] = 0;
  printf("Enter dividend:")
    for(i=0; i<17; i++)
      scanf("%d", &old[i]);
```



```
i=0;
k=0;
 for(i=i ; i<17; i++)
  arr[k++] = div[i];
while(i<33)
{
 if(arr[0]==0)
   for(arr,22);
 else
   for(arr.dd)
  arr[16] = div[i++];
}
k=0;
 for(i=17; i<33; i++)
    div[i] = arr[k++];
 printf("codword");
 for(i=0; i<33; i++)
    printf("%d", div[i]);
for(i=0; i<17; i++)
    arr[i]=0;
printf("At receiver end");
  k=0;
for(i=1; i<17; i++)
    arr[i]=0;
printf("At receiver end");
  k=0;
  for(i=1 ; i<17; i++)
     arr[k++] = div[i];
while(i<33)
  {
   if(arr[0]==0)
    xor(arr,22);
   else
```

```
    ovv[10] . div [i+7];
    }
k=0
for(i=12 ; i<33 ; i++)
    div[i] = ovv [i+1]
printf ("codeword");
  for(i=0; i<33 ; i++)
    printf ("%d", div[i]);
}
```

OUTPUT.

Enter the dataword.
1011 00 100 001.
Enter the divisor.
10 11 11 0011
codeword
10 10 10 11 10 0 0 11 10 1 0 11.
Enter
10 11 0 0 0 11 11 0 0 0 10 10 01.

WEEK 14

Write a program for congestion control using Leaky bucket algorithm.

CODE:

```
#include <stdio.h>
#include <stdlib.h> // Include this for the rand() function
int main()
{
   int buckets, outlets, k = 1, num, remaining;
   printf("Enter Bucket size and outstream size\n");
   scanf("%d %d", &buckets, &outlets);
   remaining = buckets;
   while (k)
   {
      num = rand() % 1000; // Generate a random number between 0 and 999
      if (num < remaining)
      {
         remaining = remaining - num;
         printf("Packet of %d bytes accepted\n", num); // Added missing variable
      }
      else
      {
         printf("Packet of %d bytes is discarded\n", num);
      }
      if (buckets - remaining > outlets)
      {
         remaining += outlets; // Fixed the calculation
      }
      else
         remaining = buckets;
      printf("Remaining bytes: %d \n", remaining);
      printf("If you want to stop input, press 0, otherwise, press 1\n");
      scanf("%d", &k);
```

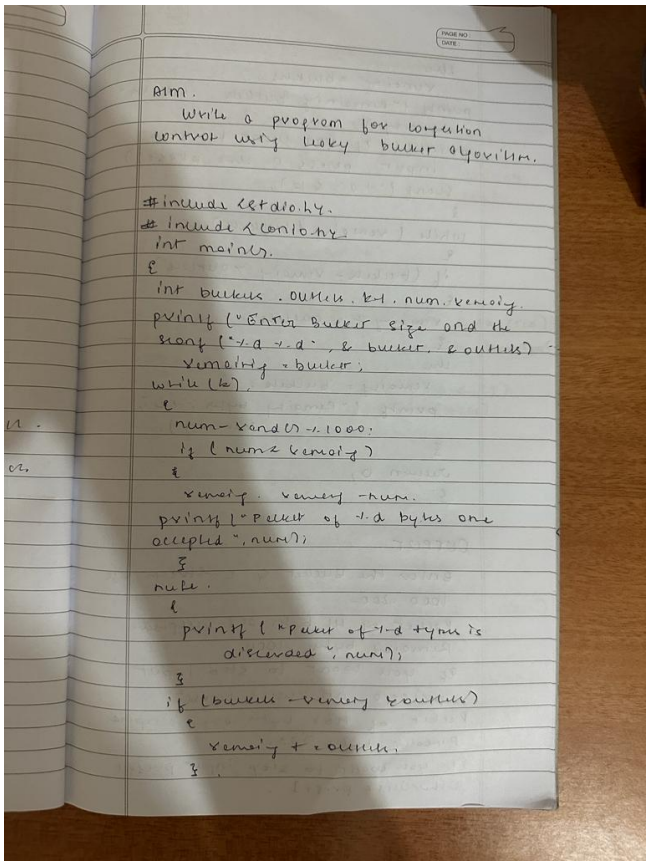
```
    }
    while (remaining < buckets) // Fixed the condition
    {
        if (buckets - remaining > outlets)
        {
            remaining += outlets; // Fixed the calculation
        }
        else
            remaining = buckets;
        printf("Remaining bytes: %d \n", remaining);
    }
    return 0; // Added a return statement to indicate successful completion
}
```

OUTPUT:

```
PS D:\VS Code> cd "d:\VS Code\OS\" ; if ($?) { gcc bucket.c -o bucket } ; if ($?) { .\bucket }
Enter Bucket size and outstream size
2000
100
Packet of 41 bytes accepted
Remaining bytes: 2000
If you want to stop input, press 0, otherwise, press 1
1
Packet of 467 bytes accepted
Remaining bytes: 1633
If you want to stop input, press 0, otherwise, press 1
1
Packet of 334 bytes accepted
Remaining bytes: 1399
If you want to stop input, press 0, otherwise, press 1
1
Packet of 500 bytes accepted
Remaining bytes: 999
If you want to stop input, press 0, otherwise, press 1
1
Packet of 169 bytes accepted
Remaining bytes: 930
If you want to stop input, press 0, otherwise, press 1
1
Packet of 724 bytes accepted
Remaining bytes: 306
If you want to stop input, press 0, otherwise, press 1
1
Packet of 478 bytes is discarded
Remaining bytes: 406
If you want to stop input, press 0, otherwise, press 1
1
Packet of 358 bytes accepted
Remaining bytes: 148
If you want to stop input, press 0, otherwise, press 1
1
Packet of 962 bytes is discarded
Remaining bytes: 248
If you want to stop input, press 0, otherwise, press 1
0
Remaining bytes: 348
Remaining bytes: 448
Remaining bytes: 548
Remaining bytes: 648
Remaining bytes: 748
```

```
Remaining bytes: 348
Remaining bytes: 448
Remaining bytes: 548
Remaining bytes: 648
Remaining bytes: 748
Remaining bytes: 848
Remaining bytes: 948
Remaining bytes: 1048
Remaining bytes: 1148
Remaining bytes: 1248
Remaining bytes: 1348
Remaining bytes: 1448
Remaining bytes: 1548
Remaining bytes: 1648
Remaining bytes: 1748
Remaining bytes: 1848
Remaining bytes: 1948
Remaining bytes: 2000
PS D:\VS Code\OS>
```

OBSERVATION:



```
    the
      remaing = buckets;
printf("remaing buckets : %d \n"
      remaing);
printf("If you want to stop
    input press 0, else press1)
    scanf("%d", &k);
}
while (remaing != buckets)
{
if (buckets - remaing >= outlets)
{
  remaing += outlets;
}
  the
    remaing = buckets;
    printf("Remaing byts : %d",
                    remaing);
}
return 0;
}
```

OUTPUT.

Enter the Bucket & outstream size
1000 200.
Packet of 11 byts are emptied.
Remaing byts : 1000.
If you want to stop input
press 0. otherwise press1
Packet of 100 byts are emptied
Remaing byts 733.
If you want to stop input press 0
Otherwise press 1.

WEEK 15

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.

CODE:

ClientTCP.py

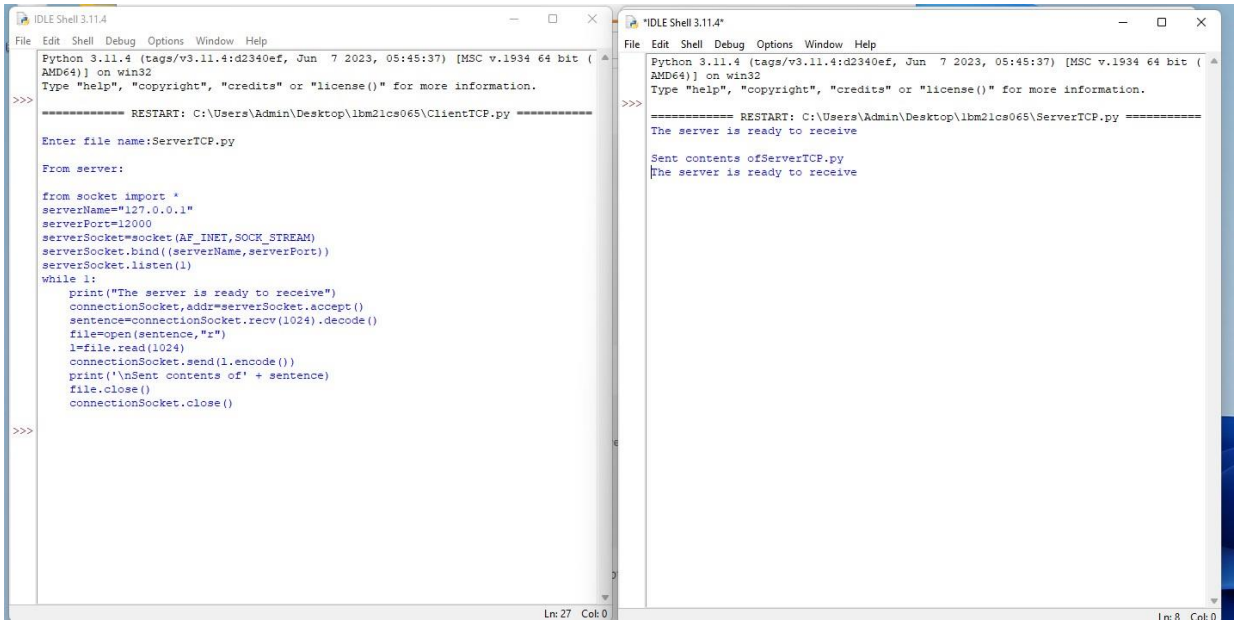
```
from socket import *
serverName = "127.0.0.1"
serverPort = 12000
clientSocket = socket(AF_INET, SOCK_STREAM)
clientSocket.connect((serverName,serverPort))
sentence = input("\nEnter file name: ")
clientSocket.send(sentence.encode())
filecontents = clientSocket.recv(1024).decode()
print ("\nFrom Server:\n")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

ServerTCP.py

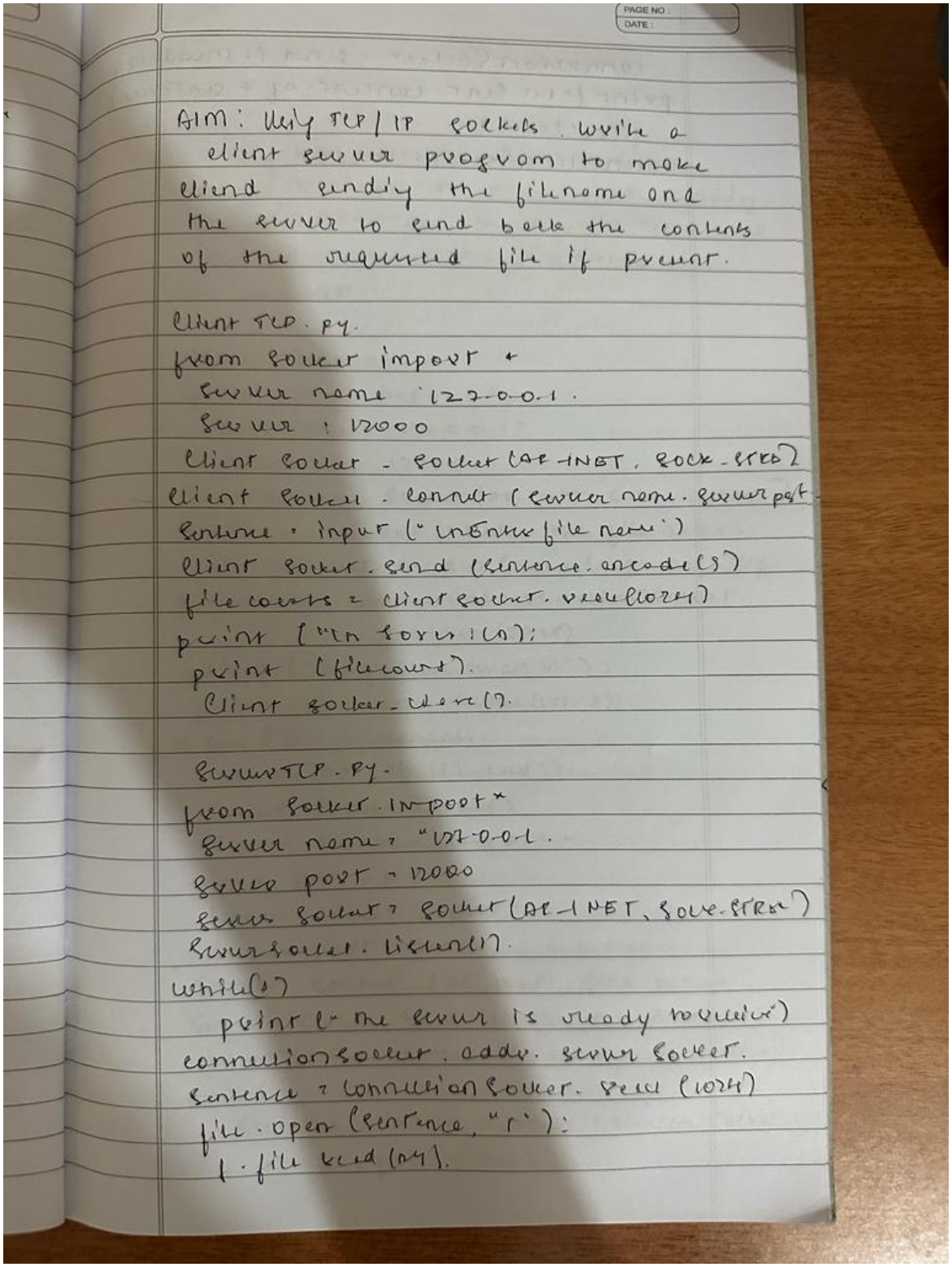
```
from socket import *
serverName="127.0.0.1"
serverPort = 12000
serverSocket = socket(AF_INET,SOCK_STREAM)
serverSocket.bind((serverName,serverPort))
serverSocket.listen(1)
while 1:
print ("The server is ready to receive")
connectionSocket, addr = serverSocket.accept()
sentence = connectionSocket.recv(1024).decode()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

print (“\nSent contents of “ + sentence)
file.close()
connectionSocket.close()

OUTPUT:



OBSERVATION:



AIM: Using TCP/IP sockets write a client server program to make client sending the filename and the server to send back the contents of the requested file if present.

Client TCP.py.

```
from socket import *
server name '127.0.0.1'.
server : 12000
client socket = socket(AF_INET, SOCK_STREAM)
client socket.connect(server name, server port
sentence = input("Enter file name")
client socket.send(sentence.encode())
file contents = client socket.recv(1024)
print("In form:(n);
print(file contents).
client socket.close().
```

ServerTCP.py.

```
from socket import *
server name = "127.0.0.1".
server port = 12000
server socket = socket(AF_INET, SOCK_STREAM)
server socket.listen(1).
while(1)
    print("The server is ready to receive")
connection socket.addr. server socket.
sentence = connection socket.recv(1024)
file.open(sentence, "r"):
    l.file read(n4).
```

PAGE NO :
DATE :

```
connectionSocket.send(l.encode())
print("in sent content of + sentence")
    file.close()
connectionSocket.close()
```

WEEK 16

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

CODE:

ClientUDP.py

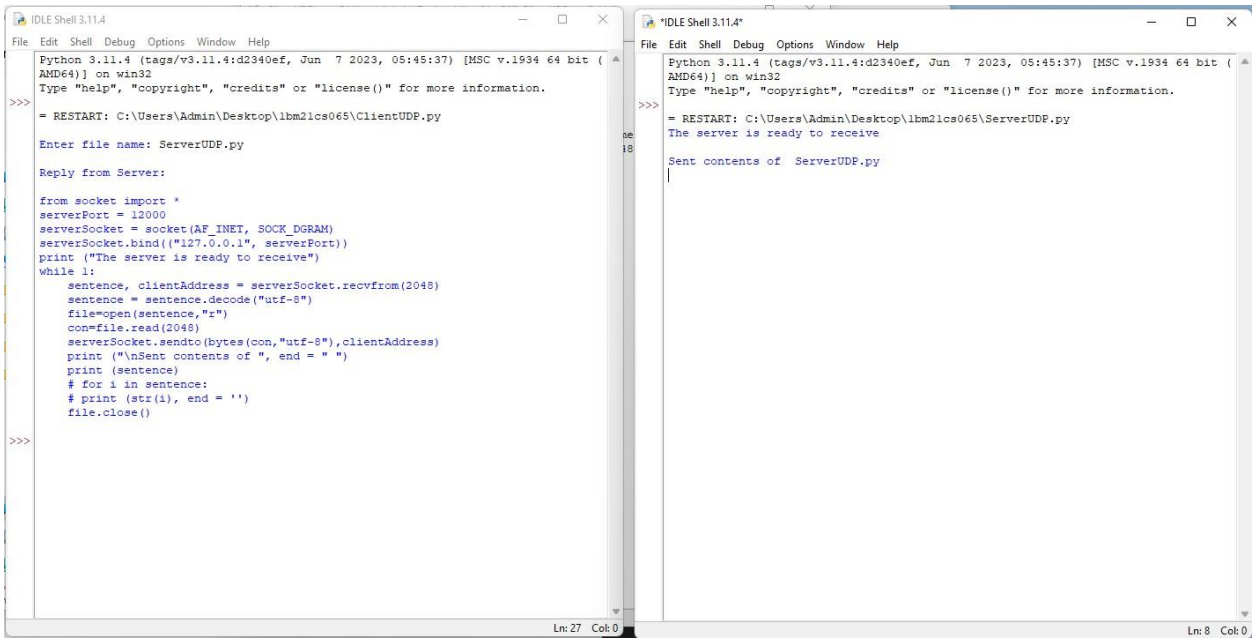
```
from socket import *
serverName = "127.0.0.1"
serverPort = 12000
clientSocket = socket(AF_INET, SOCK_DGRAM)
sentence = input("\nEnter file name: ")
clientSocket.sendto(bytes(sentence,"utf-8"),(serverName, serverPort))
filecontents,serverAddress = clientSocket.recvfrom(2048)
print ("\nReply from Server:\n")
print (filecontents.decode("utf-8"))
# for i in filecontents:
# print(str(i), end = " ")
clientSocket.close()
clientSocket.close()
```

ServerUDP.py

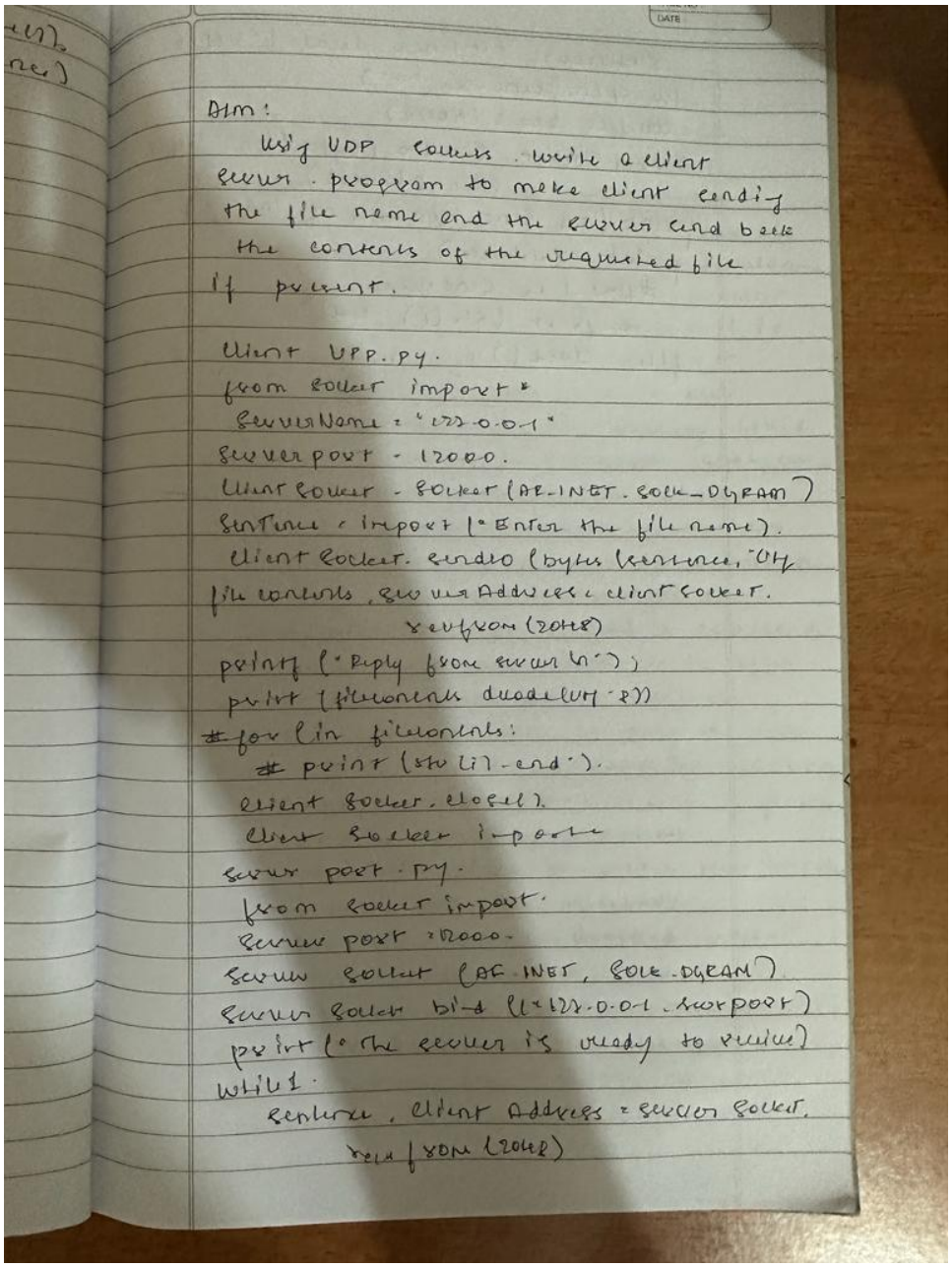
```
from socket import *
serverPort = 12000
serverSocket = socket(AF_INET, SOCK_DGRAM)
serverSocket.bind(("127.0.0.1", serverPort))
print ("The server is ready to receive")
while 1:
sentence, clientAddress = serverSocket.recvfrom(2048)
sentence = sentence.decode("utf-8")
file=open(sentence,"r")
```

```
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()
```

OUTPUT:



OBSERVATION



Aim:

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

Client UDP.py.

```
from socket import *
ServerName = '127.0.0.1'
serverport = 12000.
clientSocket = socket(AF_INET, SOCK_DGRAM)
sentence = input("Enter the file name).
clientSocket.sendto(bytes(sentence, "Ut
file contents, serverAddress = clientSocket.
                    recvfrom(2048)
print("Reply from server \n")
print(fileContents.decode(utf-8))
#for l in fileContents:
  # print(str(l), end=' ').
  clientSocket.close()
  Client Socket import
```

Server port.py.

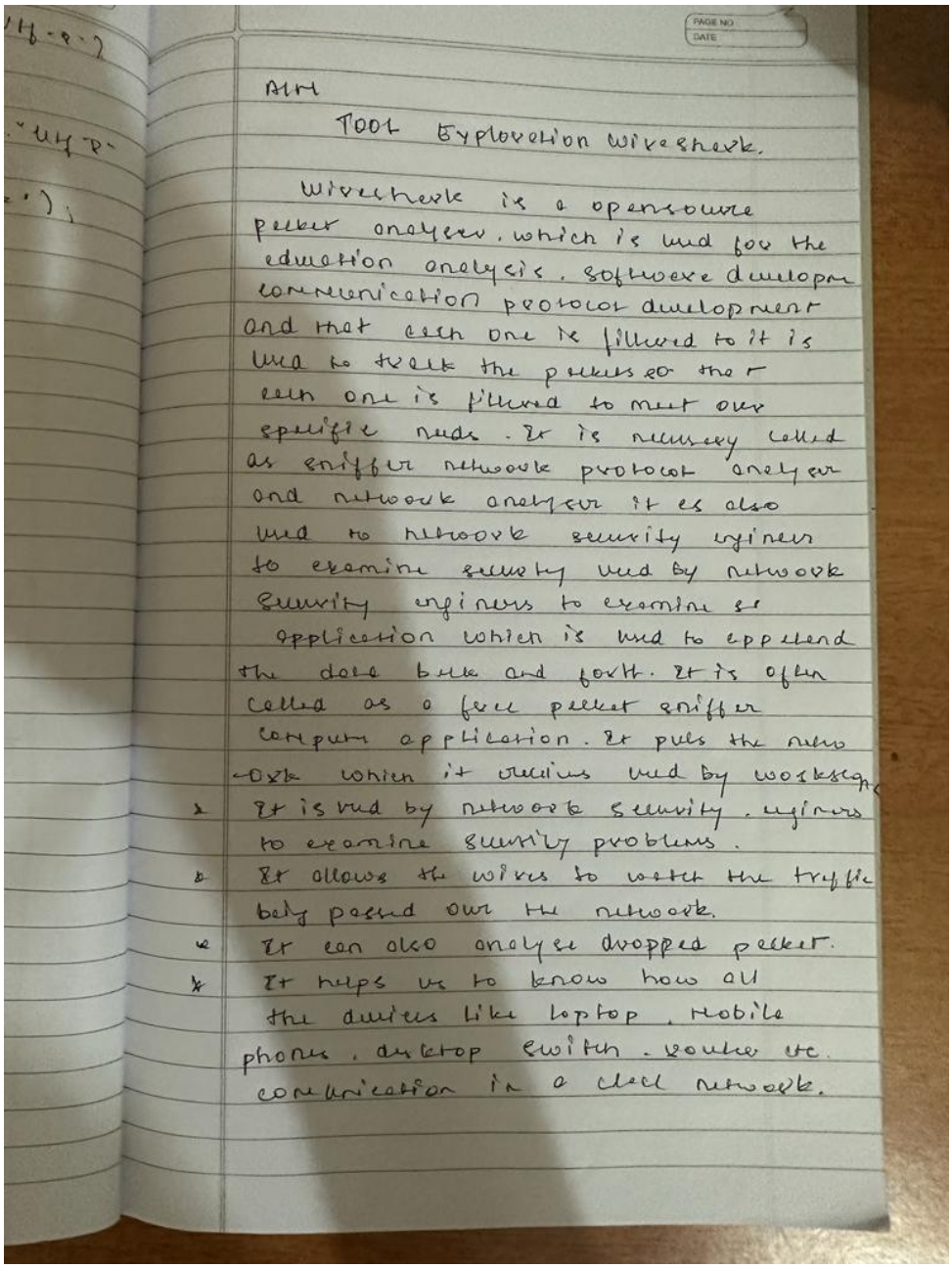
```
from socket import.
Server port = 12000.
ServerSocket (AF_INET, SOCK_DGRAM)
ServerSocket.bind(('127.0.0.1', serverport)
print("The server is ready to receive)
while 1.
  sentence, clientAddress = serverSocket.
                    recvfrom(2048)
```

```
sentence = sentence.decode("UTF-8")
file.open(sentence, "r")
con.file.read(8048)
Server Socket.sendto(bytes(con."UTF-8"
                     client address)
print("In first contents of end=")
print(sentence).
  #for i in sentence
    #print(str(i), end=").
file.close().
```

WEEK 17

Tool Exploration -Wireshark

OBSERVATION:



Aim

Tool Exploration Wireshark.

Wireshark is a opensource packet analyzer. which is used for the education analysis. software development communication protocol development and that each one is filtered to it is used to track the packets so that each one is filtered to meet our specific needs. It is necessary called as sniffer network protocol analyzer and network analyzer it is also used to network security engineers to examine security used by network security engineers to examine an application which is used to spend the data back and forth. It is often called as a free packet sniffer computer application. It puts the network which it carries used by workstation

- It is used by network security engineers to examine security problems.
- It allows the users to watch the traffic being passed over the network.
- It can also analyse dropped packet.
- It helps us to know how all the devices like laptop, mobile phones, desktop switch, router etc. communication in a check network.