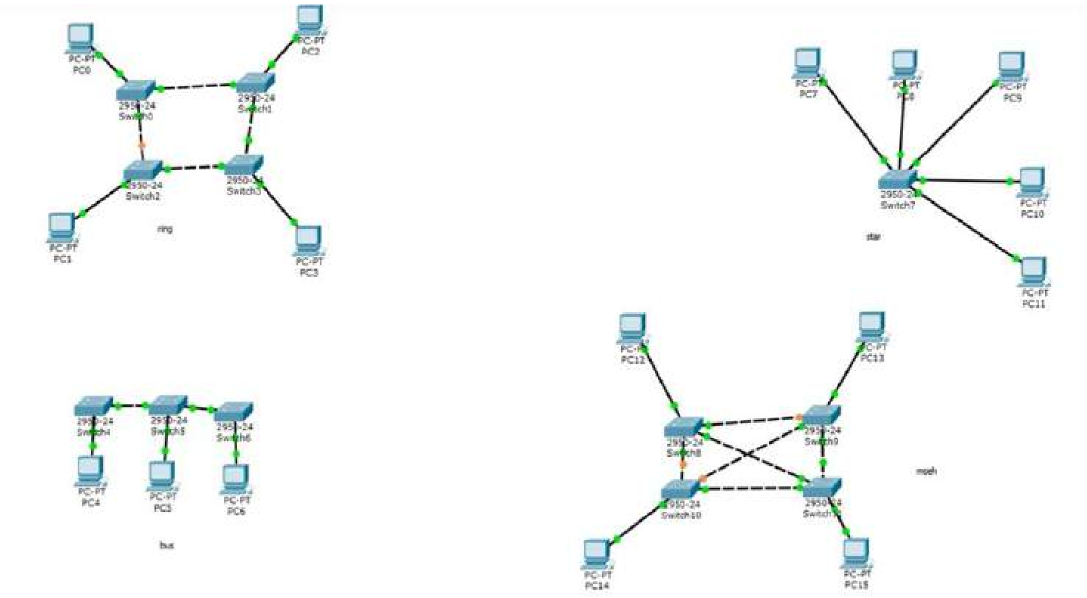
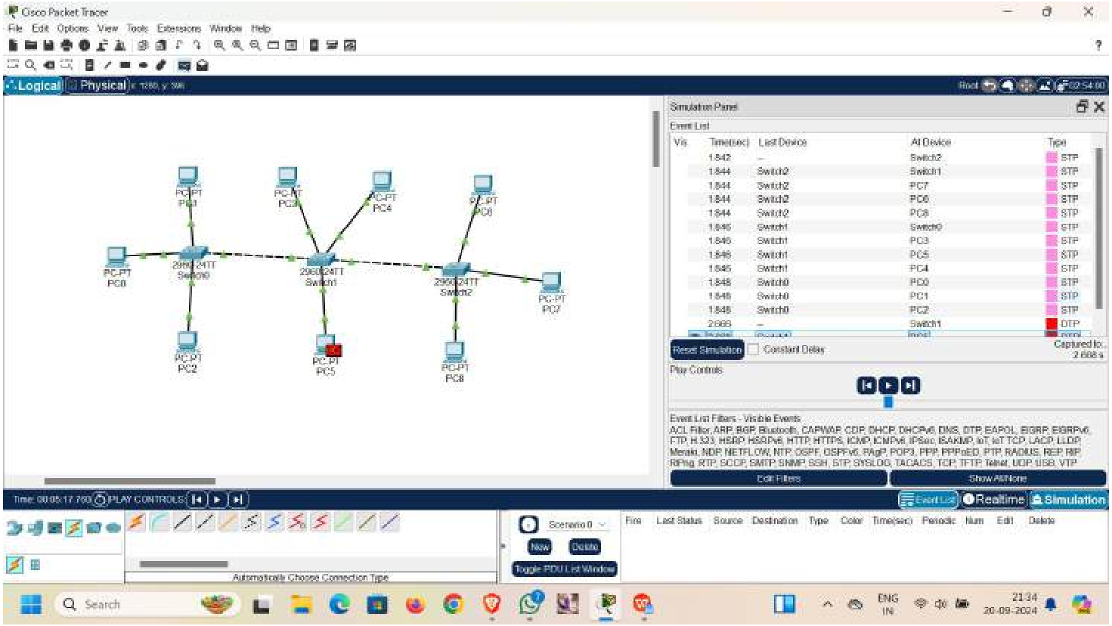
COMPUTER NETWORKS LAB DA 3

NAME:- BOYAPATI MITHIL
REG NO:- 22BCE0695

1)



2)



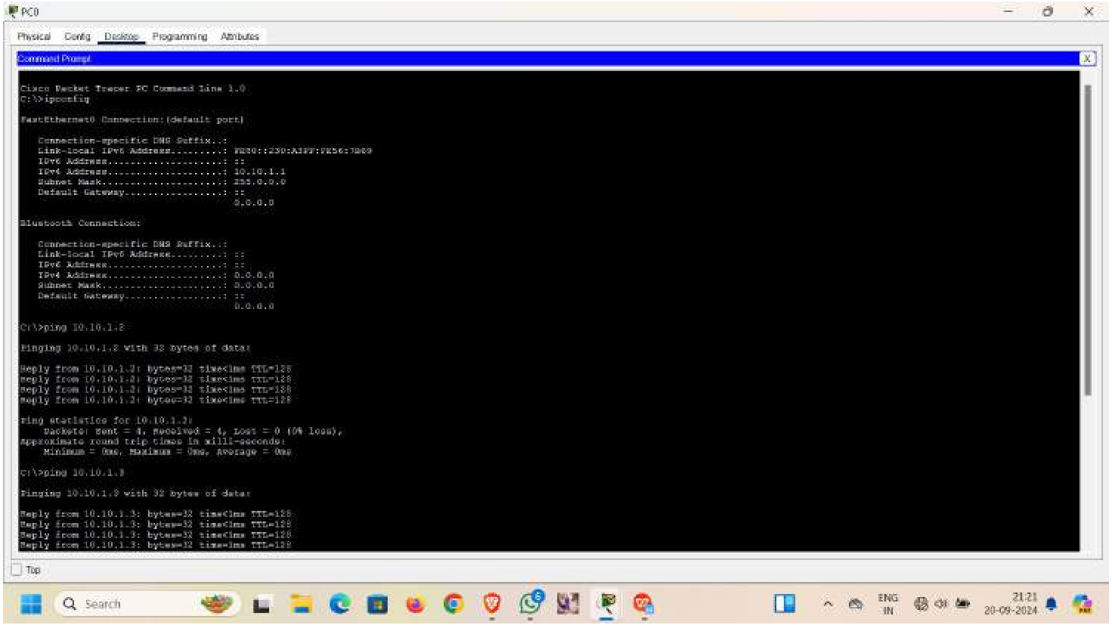
Vis	Time(sec)	Last Device	At Device	Type
	1.842	--	Switch2	STP
	1.844	Switch2	Switch1	STP
	1.844	Switch2	PC7	STP
	1.844	Switch2	PC6	STP
	1.844	Switch2	PC8	STP
	1.846	Switch1	Switch0	STP
	1.846	Switch1	PC3	STP
	1.846	Switch1	PC5	STP
	1.846	Switch1	PC4	STP
	1.848	Switch0	PC0	STP
	1.848	Switch0	PC1	STP
	1.848	Switch0	PC2	STP
	2.668	--	Switch1	DTP

Event List Filters - Visible Events
ACL Filter, ARP, BGP, Bluetooth, CAPWAP, CDP, DHCP, DHCPv6, DNS, DTP, EAPOL, EIGRP, EIGRPv6, FTP, H.323, HSRP, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPSec, ISAKMP, IoT, IoT TCP, LACP, LLDP, Meraki, NDP, NETFLOW, NTP, OSPF, OSPFv6, PAgP, POP3, PPP, PPPoED, PTP, RADIUS, REP, RIP, RIPng, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, USB, VTP

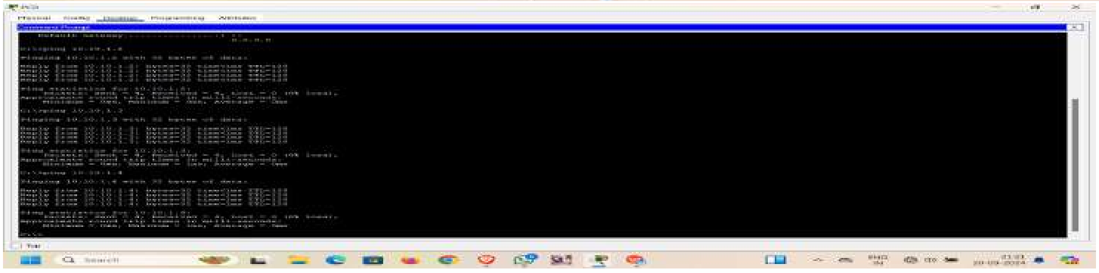
Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete

3)

PC0:-

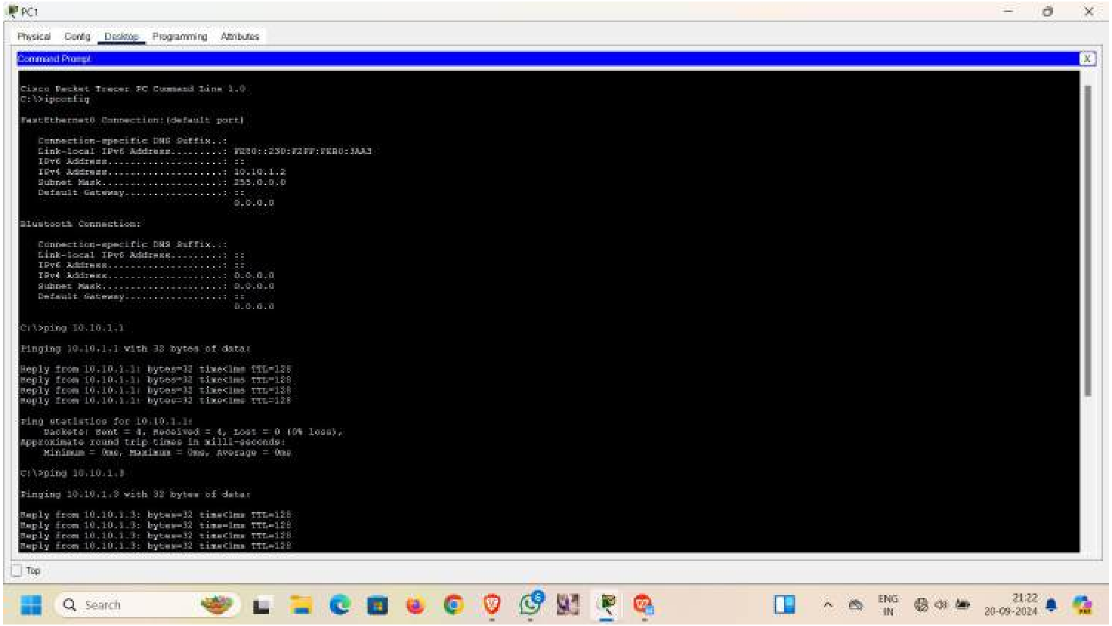


```
Cisco Packet Tracer PC Command Line 1.0
C:\>ipconfig

FastEthernet0 Connection:(default port)

   Connection-specific DNS Suffix..:
   Link-local IPv6 Address.........: FE80::230:A3FF:FE56:3869
   IPv6 Address....................: ::
   IPv4 Address....................: 10.10.1.1
   Subnet Mask.....................: 255.0.0.0
   Default Gateway.................: ::
                                     0.0.0.0

Bluetooth Connection:

   Connection-specific DNS Suffix..:
   Link-local IPv6 Address.........: ::
   IPv6 Address....................: ::
   IPv4 Address....................: 0.0.0.0
   Subnet Mask.....................: 0.0.0.0
   Default Gateway.................: ::
                                     0.0.0.0

C:\>ping 10.10.1.2

Pinging 10.10.1.2 with 32 bytes of data:

Reply from 10.10.1.2: bytes=32 time<1ms TTL=128
Reply from 10.10.1.2: bytes=32 time<1ms TTL=128
Reply from 10.10.1.2: bytes=32 time<1ms TTL=128
Reply from 10.10.1.2: bytes=32 time<1ms TTL=128

Ping statistics for 10.10.1.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 10.10.1.3

Pinging 10.10.1.3 with 32 bytes of data:

Reply from 10.10.1.3: bytes=32 time<1ms TTL=128
Reply from 10.10.1.3: bytes=32 time<1ms TTL=128
Reply from 10.10.1.3: bytes=32 time<1ms TTL=128
Reply from 10.10.1.3: bytes=32 time=1ms TTL=128
```

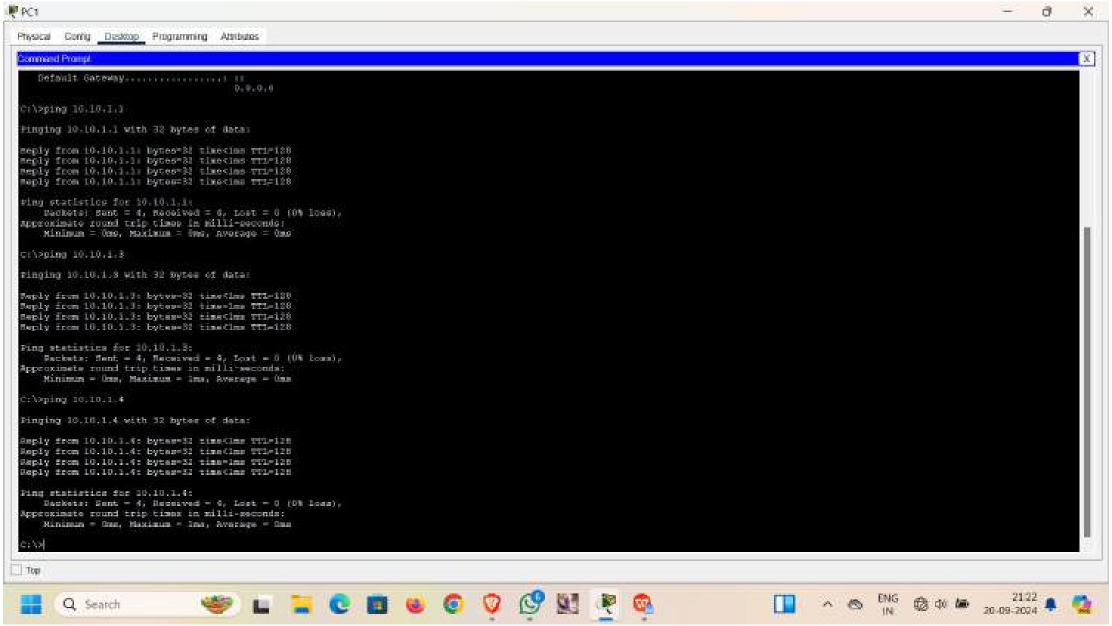


```
   Default Gateway.................: ::
                                     0.0.0.0
C:\>ping 10.10.1.2
Pinging 10.10.1.2 with 32 bytes of data:
Reply from 10.10.1.2: bytes=32 time<1ms TTL=128
Reply from 10.10.1.2: bytes=32 time<1ms TTL=128
Reply from 10.10.1.2: bytes=32 time<1ms TTL=128
Reply from 10.10.1.2: bytes=32 time<1ms TTL=128
Ping statistics for 10.10.1.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
C:\>ping 10.10.1.3
Pinging 10.10.1.3 with 32 bytes of data:
[illegible]
Ping statistics for 10.10.1.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms
C:\>ping 10.10.1.4
Pinging 10.10.1.4 with 32 bytes of data:
[illegible]
Ping statistics for 10.10.1.4:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
C:\>
```

PC1:-

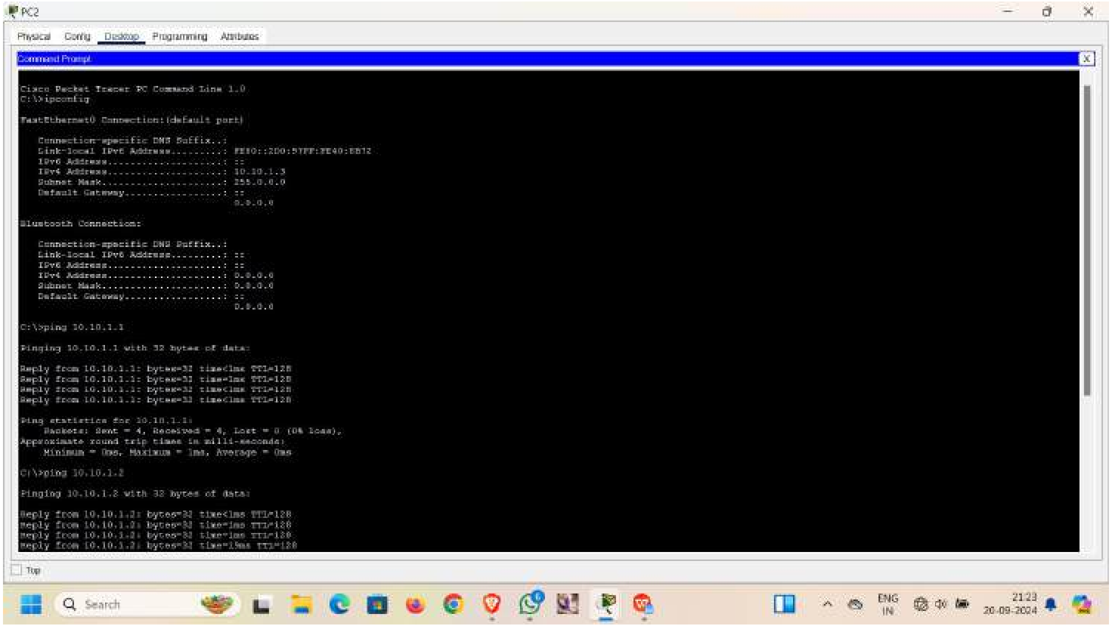


```
Cisco Packet Tracer PC Command Line 1.0
C:\>ipconfig

FastEthernet0 Connection:(default port)

   Connection-specific DNS Suffix..:
   Link-local IPv6 Address.........: FE80::230:F2FF:FEB0:3AA3
   IPv6 Address....................: ::
   IPv4 Address....................: 10.10.1.2
   Subnet Mask.....................: 255.0.0.0
   Default Gateway.................: ::
                                     0.0.0.0

Bluetooth Connection:

   Connection-specific DNS Suffix..:
   Link-local IPv6 Address.........: ::
   IPv6 Address....................: ::
   IPv4 Address....................: 0.0.0.0
   Subnet Mask.....................: 0.0.0.0
   Default Gateway.................: ::
                                     0.0.0.0

C:\>ping 10.10.1.1

Pinging 10.10.1.1 with 32 bytes of data:

Reply from 10.10.1.1: bytes=32 time<1ms TTL=128
Reply from 10.10.1.1: bytes=32 time<1ms TTL=128
Reply from 10.10.1.1: bytes=32 time<1ms TTL=128
Reply from 10.10.1.1: bytes=32 time<1ms TTL=128

Ping statistics for 10.10.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 10.10.1.3

Pinging 10.10.1.3 with 32 bytes of data:

Reply from 10.10.1.3: bytes=32 time<1ms TTL=128
Reply from 10.10.1.3: bytes=32 time=1ms TTL=128
Reply from 10.10.1.3: bytes=32 time<1ms TTL=128
Reply from 10.10.1.3: bytes=32 time<1ms TTL=128
```

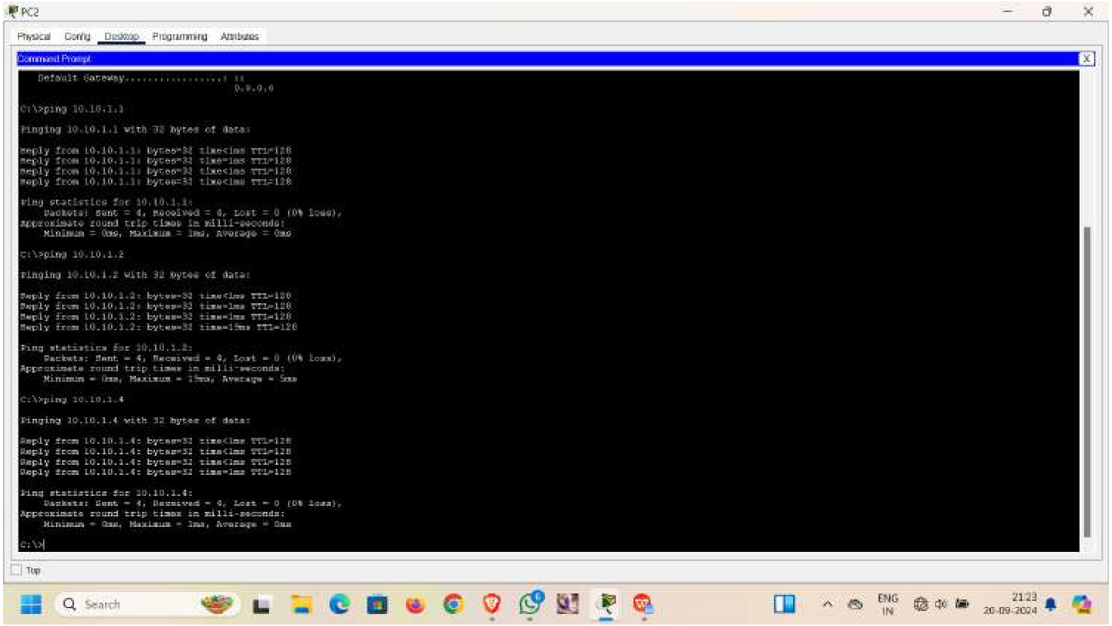


```
   Default Gateway.................: ::
                                     0.0.0.0

C:\>ping 10.10.1.1

Pinging 10.10.1.1 with 32 bytes of data:

Reply from 10.10.1.1: bytes=32 time<1ms TTL=128
Reply from 10.10.1.1: bytes=32 time<1ms TTL=128
Reply from 10.10.1.1: bytes=32 time<1ms TTL=128
Reply from 10.10.1.1: bytes=32 time<1ms TTL=128

Ping statistics for 10.10.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 10.10.1.3

Pinging 10.10.1.3 with 32 bytes of data:

Reply from 10.10.1.3: bytes=32 time<1ms TTL=128
Reply from 10.10.1.3: bytes=32 time=1ms TTL=128
Reply from 10.10.1.3: bytes=32 time<1ms TTL=128
Reply from 10.10.1.3: bytes=32 time<1ms TTL=128

Ping statistics for 10.10.1.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>ping 10.10.1.4

Pinging 10.10.1.4 with 32 bytes of data:

Reply from 10.10.1.4: bytes=32 time<1ms TTL=128
Reply from 10.10.1.4: bytes=32 time<1ms TTL=128
Reply from 10.10.1.4: bytes=32 time=1ms TTL=128
Reply from 10.10.1.4: bytes=32 time<1ms TTL=128

Ping statistics for 10.10.1.4:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>
```

PC2:-

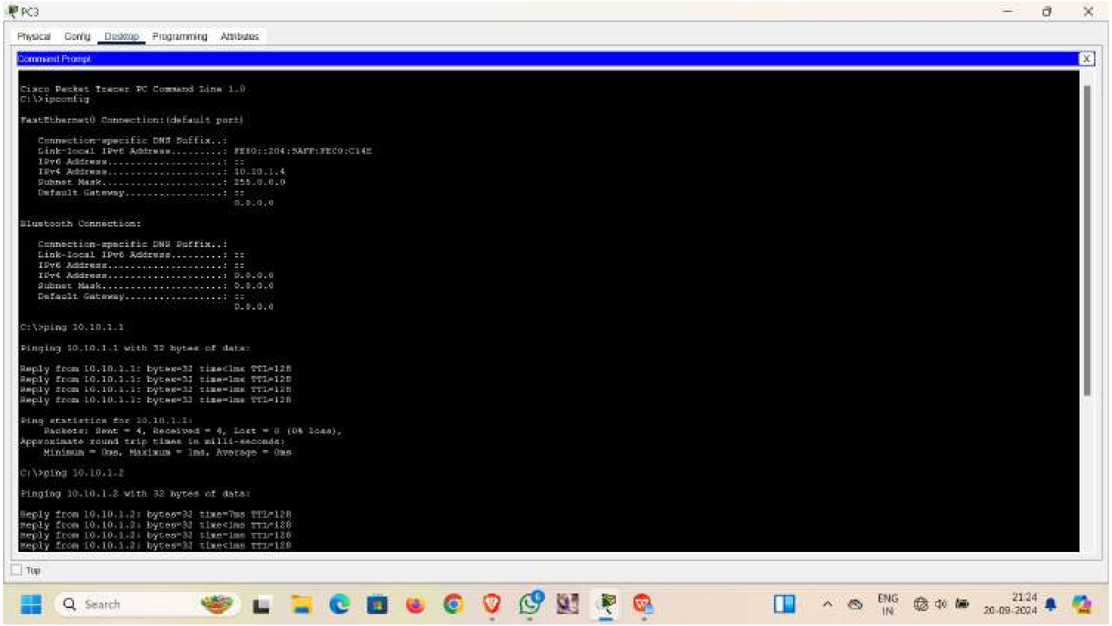


```
Cisco Packet Tracer PC Command Line 1.0
C:\>ipconfig

FastEthernet0 Connection:(default port)

   Connection-specific DNS Suffix..:
   Link-local IPv6 Address.........: FE80::200:57FF:FE40:EB72
   IPv6 Address....................: ::
   IPv4 Address....................: 10.10.1.3
   Subnet Mask.....................: 255.0.0.0
   Default Gateway.................: ::
                                     0.0.0.0

Bluetooth Connection:

   Connection-specific DNS Suffix..:
   Link-local IPv6 Address.........: ::
   IPv6 Address....................: ::
   IPv4 Address....................: 0.0.0.0
   Subnet Mask.....................: 0.0.0.0
   Default Gateway.................: ::
                                     0.0.0.0

C:\>ping 10.10.1.1

Pinging 10.10.1.1 with 32 bytes of data:

Reply from 10.10.1.1: bytes=32 time<1ms TTL=128
Reply from 10.10.1.1: bytes=32 time=1ms TTL=128
Reply from 10.10.1.1: bytes=32 time<1ms TTL=128
Reply from 10.10.1.1: bytes=32 time<1ms TTL=128

Ping statistics for 10.10.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>ping 10.10.1.2

Pinging 10.10.1.2 with 32 bytes of data:

Reply from 10.10.1.2: bytes=32 time<1ms TTL=128
Reply from 10.10.1.2: bytes=32 time=1ms TTL=128
Reply from 10.10.1.2: bytes=32 time=1ms TTL=128
Reply from 10.10.1.2: bytes=32 time=19ms TTL=128
```

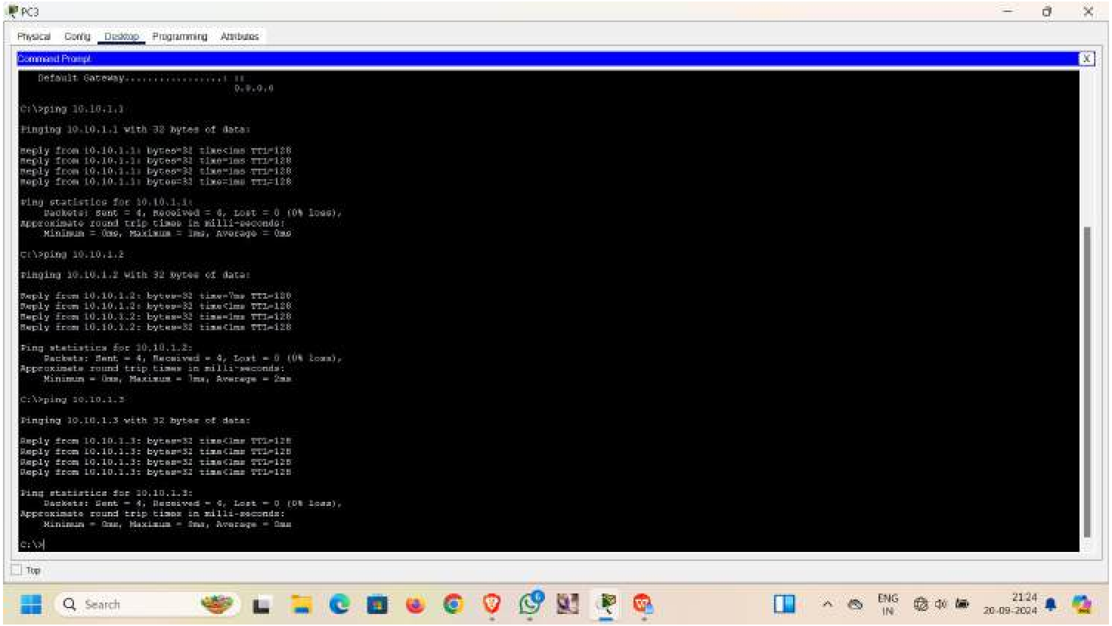


```
   Default Gateway.................: ::
                                     0.0.0.0

C:\>ping 10.10.1.1

Pinging 10.10.1.1 with 32 bytes of data:

Reply from 10.10.1.1: bytes=32 time<1ms TTL=128
Reply from 10.10.1.1: bytes=32 time=1ms TTL=128
Reply from 10.10.1.1: bytes=32 time<1ms TTL=128
Reply from 10.10.1.1: bytes=32 time<1ms TTL=128

Ping statistics for 10.10.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>ping 10.10.1.2

Pinging 10.10.1.2 with 32 bytes of data:

Reply from 10.10.1.2: bytes=32 time<1ms TTL=128
Reply from 10.10.1.2: bytes=32 time=1ms TTL=128
Reply from 10.10.1.2: bytes=32 time=1ms TTL=128
Reply from 10.10.1.2: bytes=32 time=19ms TTL=128

Ping statistics for 10.10.1.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 19ms, Average = 5ms

C:\>ping 10.10.1.4

Pinging 10.10.1.4 with 32 bytes of data:

Reply from 10.10.1.4: bytes=32 time<1ms TTL=128
Reply from 10.10.1.4: bytes=32 time<1ms TTL=128
Reply from 10.10.1.4: bytes=32 time<1ms TTL=128
Reply from 10.10.1.4: bytes=32 time=1ms TTL=128

Ping statistics for 10.10.1.4:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>
```

PC3:-

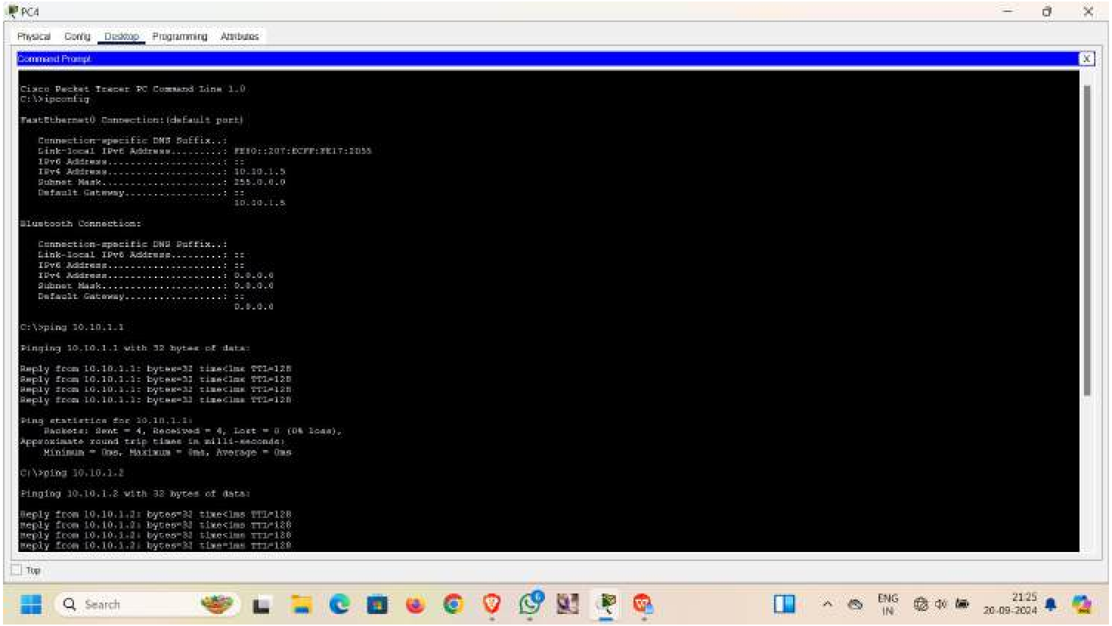


```
Cisco Packet Tracer PC Command Line 1.0
C:\>ipconfig

FastEthernet0 Connection:(default port)

   Connection-specific DNS Suffix..:
   Link-local IPv6 Address.........: FE80::204:5AFF:FEC0:C14E
   IPv6 Address....................: ::
   IPv4 Address....................: 10.10.1.4
   Subnet Mask.....................: 255.0.0.0
   Default Gateway.................: ::
                                     0.0.0.0

Bluetooth Connection:

   Connection-specific DNS Suffix..:
   Link-local IPv6 Address.........: ::
   IPv6 Address....................: ::
   IPv4 Address....................: 0.0.0.0
   Subnet Mask.....................: 0.0.0.0
   Default Gateway.................: ::
                                     0.0.0.0

C:\>ping 10.10.1.1

Pinging 10.10.1.1 with 32 bytes of data:

Reply from 10.10.1.1: bytes=32 time<1ms TTL=128
Reply from 10.10.1.1: bytes=32 time=1ms TTL=128
Reply from 10.10.1.1: bytes=32 time=1ms TTL=128
Reply from 10.10.1.1: bytes=32 time=1ms TTL=128

Ping statistics for 10.10.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>ping 10.10.1.2

Pinging 10.10.1.2 with 32 bytes of data:

Reply from 10.10.1.2: bytes=32 time=7ms TTL=128
Reply from 10.10.1.2: bytes=32 time<1ms TTL=128
Reply from 10.10.1.2: bytes=32 time=1ms TTL=128
Reply from 10.10.1.2: bytes=32 time<1ms TTL=128
```

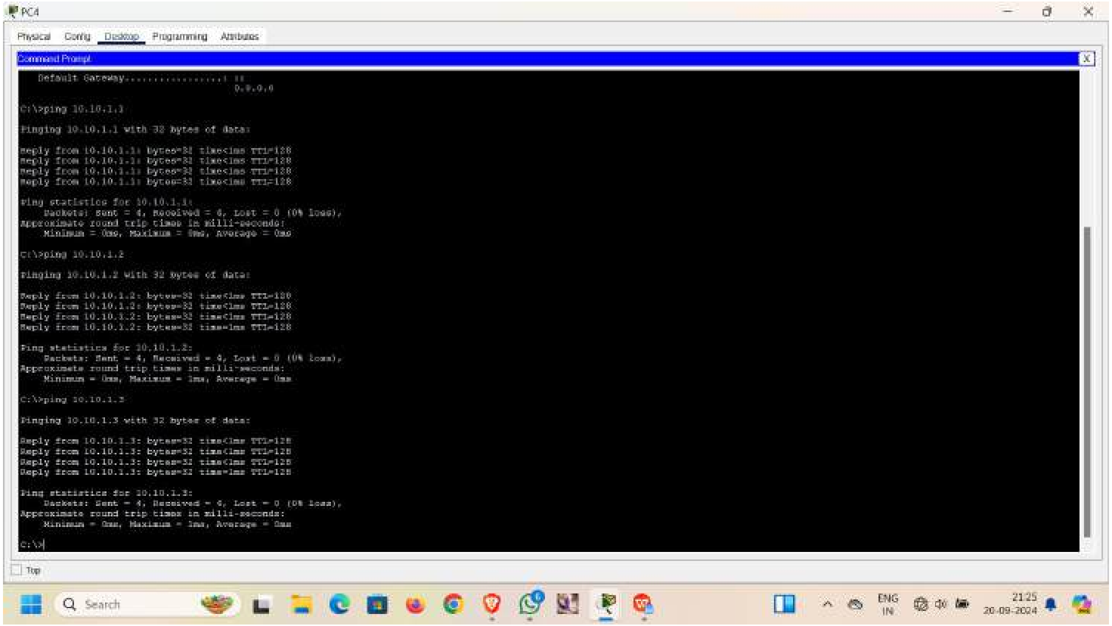


```
   Default Gateway.................: ::
                                     0.0.0.0

C:\>ping 10.10.1.1

Pinging 10.10.1.1 with 32 bytes of data:

Reply from 10.10.1.1: bytes=32 time<1ms TTL=128
Reply from 10.10.1.1: bytes=32 time=1ms TTL=128
Reply from 10.10.1.1: bytes=32 time=1ms TTL=128
Reply from 10.10.1.1: bytes=32 time=1ms TTL=128

Ping statistics for 10.10.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>ping 10.10.1.2

Pinging 10.10.1.2 with 32 bytes of data:

Reply from 10.10.1.2: bytes=32 time=7ms TTL=128
Reply from 10.10.1.2: bytes=32 time<1ms TTL=128
Reply from 10.10.1.2: bytes=32 time=1ms TTL=128
Reply from 10.10.1.2: bytes=32 time<1ms TTL=128

Ping statistics for 10.10.1.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 7ms, Average = 2ms

C:\>ping 10.10.1.3

Pinging 10.10.1.3 with 32 bytes of data:

Reply from 10.10.1.3: bytes=32 time<1ms TTL=128
Reply from 10.10.1.3: bytes=32 time<1ms TTL=128
Reply from 10.10.1.3: bytes=32 time<1ms TTL=128
Reply from 10.10.1.3: bytes=32 time<1ms TTL=128

Ping statistics for 10.10.1.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```

PC4:-

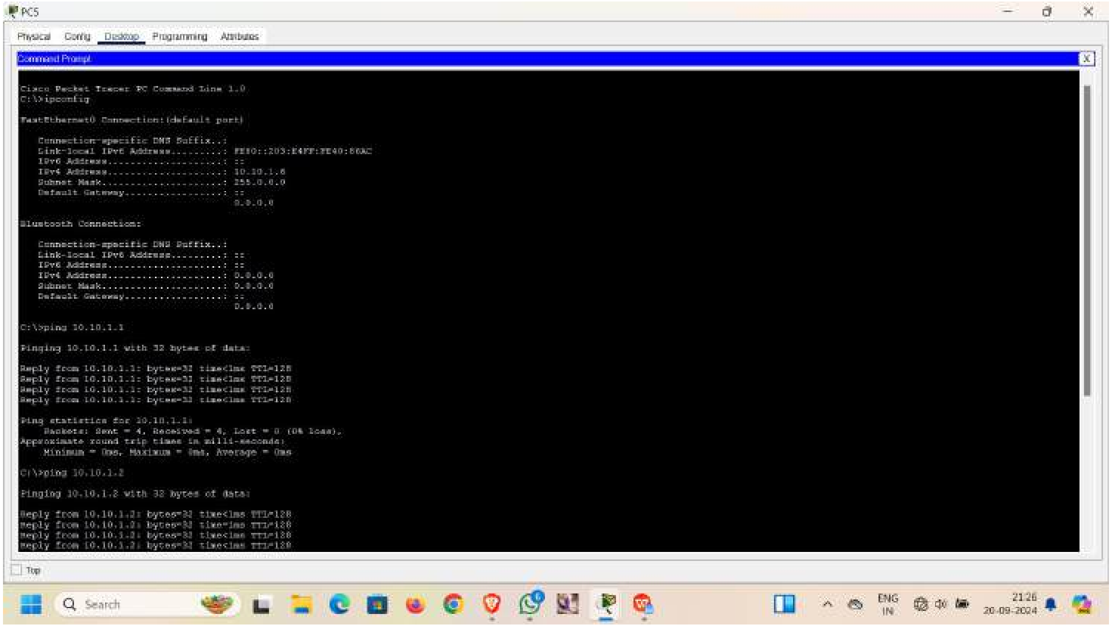


```
Cisco Packet Tracer PC Command Line 1.0
C:\>ipconfig

FastEthernet0 Connection:(default port)

   Connection-specific DNS Suffix..:
   Link-local IPv6 Address.........: FE80::207:ECFF:FE17:2055
   IPv6 Address....................: ::
   IPv4 Address....................: 10.10.1.5
   Subnet Mask.....................: 255.0.0.0
   Default Gateway.................: ::
                                     10.10.1.5

Bluetooth Connection:

   Connection-specific DNS Suffix..:
   Link-local IPv6 Address.........: ::
   IPv6 Address....................: ::
   IPv4 Address....................: 0.0.0.0
   Subnet Mask.....................: 0.0.0.0
   Default Gateway.................: ::
                                     0.0.0.0

C:\>ping 10.10.1.1

Pinging 10.10.1.1 with 32 bytes of data:

Reply from 10.10.1.1: bytes=32 time<1ms TTL=128
Reply from 10.10.1.1: bytes=32 time<1ms TTL=128
Reply from 10.10.1.1: bytes=32 time<1ms TTL=128
Reply from 10.10.1.1: bytes=32 time<1ms TTL=128

Ping statistics for 10.10.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 10.10.1.2

Pinging 10.10.1.2 with 32 bytes of data:

Reply from 10.10.1.2: bytes=32 time<1ms TTL=128
Reply from 10.10.1.2: bytes=32 time<1ms TTL=128
Reply from 10.10.1.2: bytes=32 time<1ms TTL=128
Reply from 10.10.1.2: bytes=32 time=1ms TTL=128
```

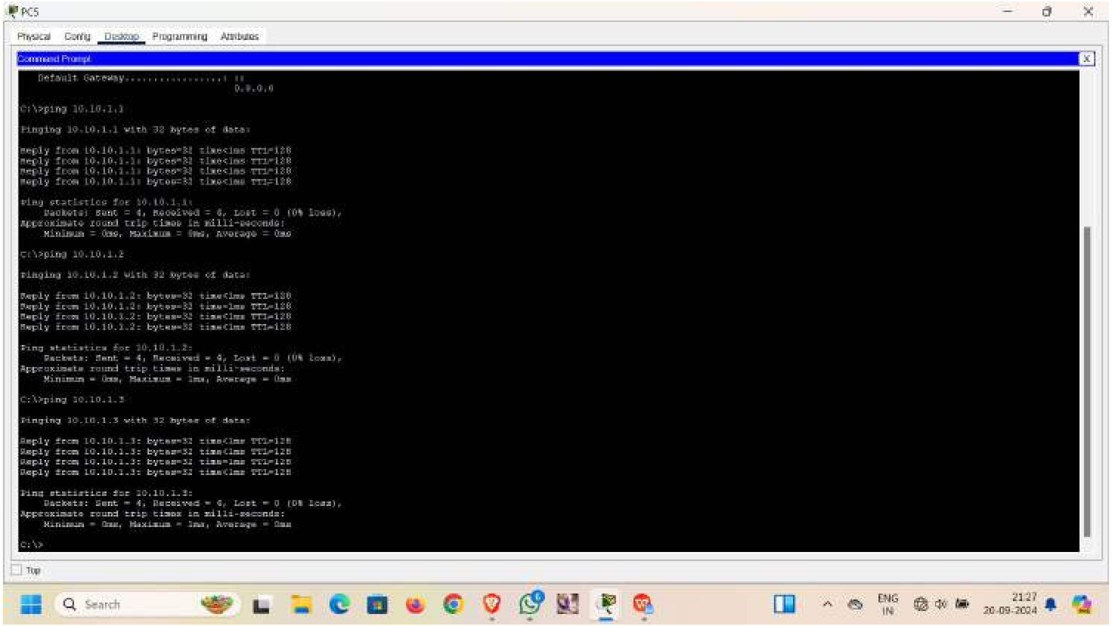


```
   Default Gateway.................: ::
                                     0.0.0.0

C:\>ping 10.10.1.1

Pinging 10.10.1.1 with 32 bytes of data:

Reply from 10.10.1.1: bytes=32 time<1ms TTL=128
Reply from 10.10.1.1: bytes=32 time<1ms TTL=128
Reply from 10.10.1.1: bytes=32 time<1ms TTL=128
Reply from 10.10.1.1: bytes=32 time<1ms TTL=128

Ping statistics for 10.10.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 10.10.1.2

Pinging 10.10.1.2 with 32 bytes of data:

Reply from 10.10.1.2: bytes=32 time<1ms TTL=128
Reply from 10.10.1.2: bytes=32 time<1ms TTL=128
Reply from 10.10.1.2: bytes=32 time<1ms TTL=128
Reply from 10.10.1.2: bytes=32 time=1ms TTL=128

Ping statistics for 10.10.1.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>ping 10.10.1.3

Pinging 10.10.1.3 with 32 bytes of data:

Reply from 10.10.1.3: bytes=32 time<1ms TTL=128
Reply from 10.10.1.3: bytes=32 time<1ms TTL=128
Reply from 10.10.1.3: bytes=32 time<1ms TTL=128
Reply from 10.10.1.3: bytes=32 time=1ms TTL=128

Ping statistics for 10.10.1.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>
```

PC5:-



```
Cisco Packet Tracer PC Command Line 1.0
C:\>ipconfig

FastEthernet0 Connection:(default port)

   Connection-specific DNS Suffix..:
   Link-local IPv6 Address.........: FE80::203:E4FF:FE40:86AC
   IPv6 Address....................: ::
   IPv4 Address....................: 10.10.1.6
   Subnet Mask.....................: 255.0.0.0
   Default Gateway.................: ::
                                     0.0.0.0

Bluetooth Connection:

   Connection-specific DNS Suffix..:
   Link-local IPv6 Address.........: ::
   IPv6 Address....................: ::
   IPv4 Address....................: 0.0.0.0
   Subnet Mask.....................: 0.0.0.0
   Default Gateway.................: ::
                                     0.0.0.0

C:\>ping 10.10.1.1

Pinging 10.10.1.1 with 32 bytes of data:

Reply from 10.10.1.1: bytes=32 time<1ms TTL=128
Reply from 10.10.1.1: bytes=32 time<1ms TTL=128
Reply from 10.10.1.1: bytes=32 time<1ms TTL=128
Reply from 10.10.1.1: bytes=32 time<1ms TTL=128

Ping statistics for 10.10.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 10.10.1.2

Pinging 10.10.1.2 with 32 bytes of data:

Reply from 10.10.1.2: bytes=32 time<1ms TTL=128
Reply from 10.10.1.2: bytes=32 time=1ms TTL=128
Reply from 10.10.1.2: bytes=32 time<1ms TTL=128
Reply from 10.10.1.2: bytes=32 time<1ms TTL=128
```

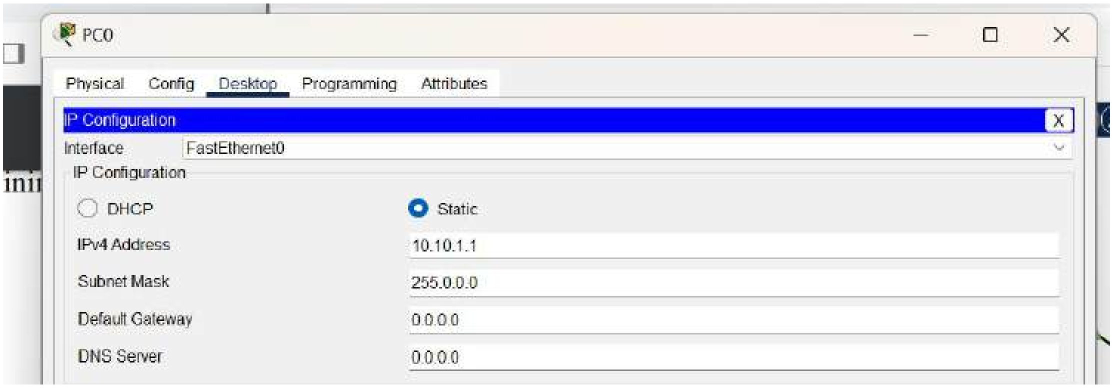


```
   Default Gateway.................: ::
                                     0.0.0.0

C:\>ping 10.10.1.1

Pinging 10.10.1.1 with 32 bytes of data:

Reply from 10.10.1.1: bytes=32 time<1ms TTL=128
Reply from 10.10.1.1: bytes=32 time<1ms TTL=128
Reply from 10.10.1.1: bytes=32 time<1ms TTL=128
Reply from 10.10.1.1: bytes=32 time<1ms TTL=128

Ping statistics for 10.10.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 10.10.1.2

Pinging 10.10.1.2 with 32 bytes of data:

Reply from 10.10.1.2: bytes=32 time<1ms TTL=128
Reply from 10.10.1.2: bytes=32 time=1ms TTL=128
Reply from 10.10.1.2: bytes=32 time<1ms TTL=128
Reply from 10.10.1.2: bytes=32 time<1ms TTL=128

Ping statistics for 10.10.1.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>ping 10.10.1.3

Pinging 10.10.1.3 with 32 bytes of data:

Reply from 10.10.1.3: bytes=32 time<1ms TTL=128
Reply from 10.10.1.3: bytes=32 time<1ms TTL=128
Reply from 10.10.1.3: bytes=32 time=1ms TTL=128
Reply from 10.10.1.3: bytes=32 time<1ms TTL=128

Ping statistics for 10.10.1.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>
```

4)

A)

PC0:-



Interface FastEthernet0

IP Configuration

○ DHCP ● Static

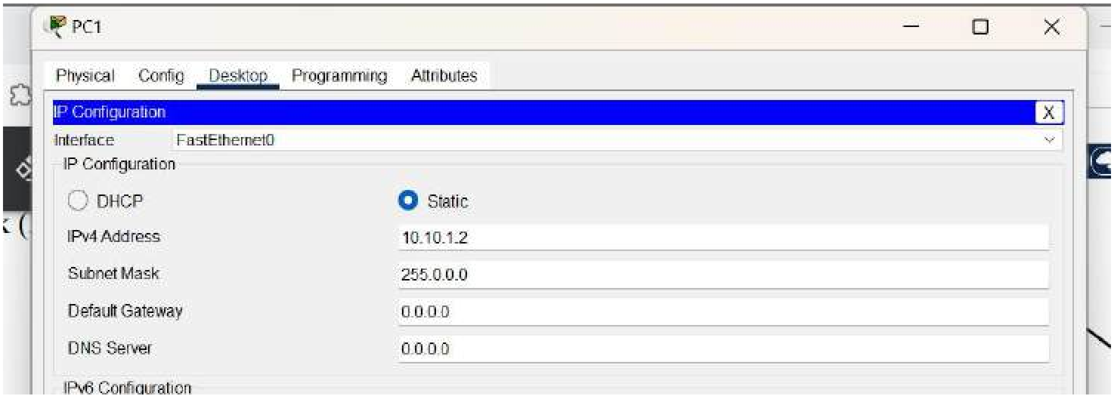
IPv4 Address 10.10.1.1

Subnet Mask 255.0.0.0

Default Gateway 0.0.0.0

DNS Server 0.0.0.0

PC1:-



Interface FastEthernet0

IP Configuration

○ DHCP ● Static

IPv4 Address 10.10.1.2

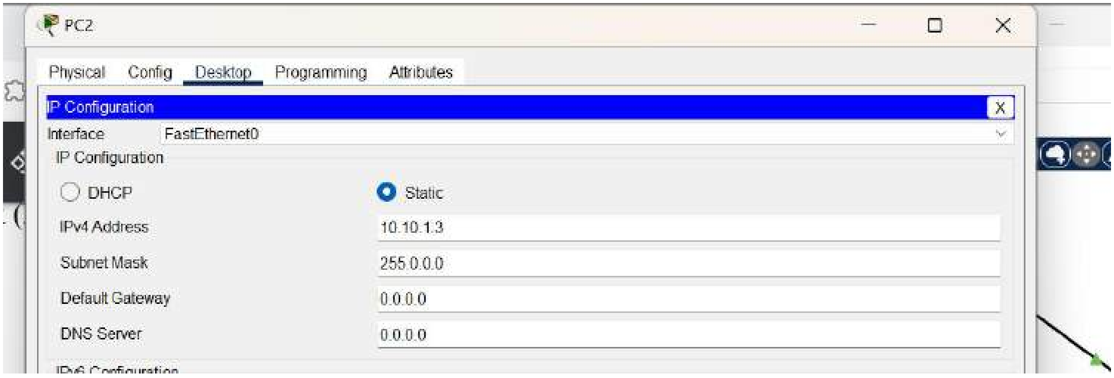
Subnet Mask 255.0.0.0

Default Gateway 0.0.0.0

DNS Server 0.0.0.0

IPv6 Configuration

PC2:-



Interface FastEthernet0

IP Configuration

○ DHCP ● Static

IPv4 Address 10.10.1.3

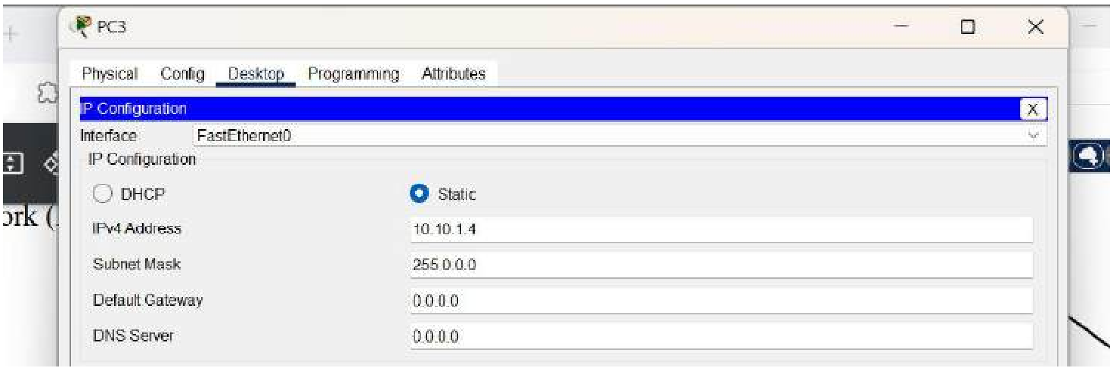
Subnet Mask 255.0.0.0

Default Gateway 0.0.0.0

DNS Server 0.0.0.0

IPv6 Configuration

PC3:-



IP Configuration

Interface FastEthernet0

IP Configuration

○ DHCP ● Static

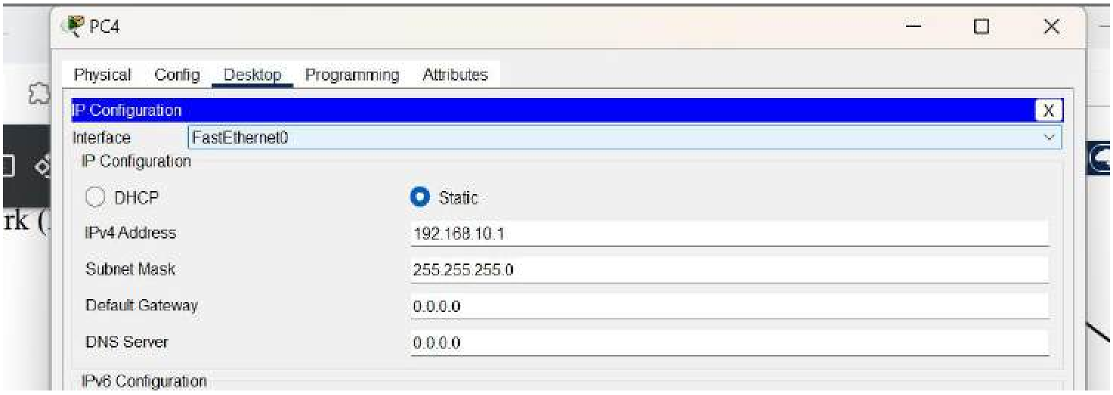
IPv4 Address 10.10.1.4

Subnet Mask 255.0.0.0

Default Gateway 0.0.0.0

DNS Server 0.0.0.0

PC4:-



IP Configuration

Interface FastEthernet0

IP Configuration

○ DHCP ● Static

IPv4 Address 192.168.10.1

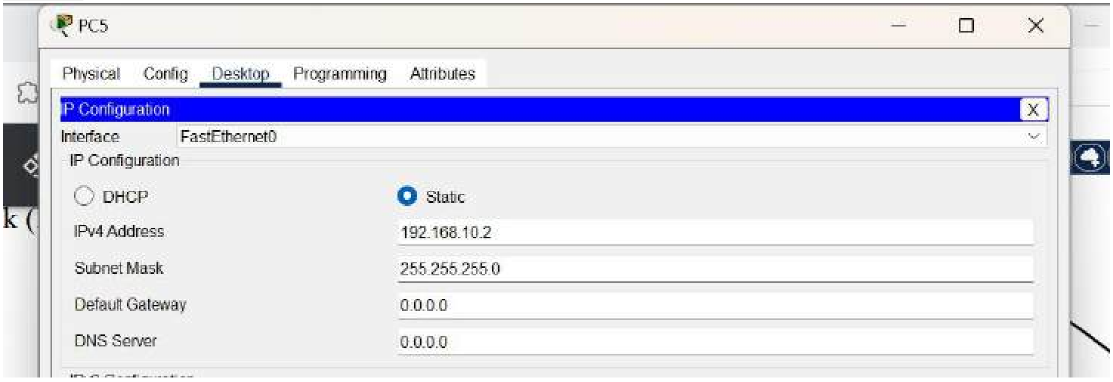
Subnet Mask 255.255.255.0

Default Gateway 0.0.0.0

DNS Server 0.0.0.0

IPv6 Configuration

PC5:-



IP Configuration

Interface FastEthernet0

IP Configuration

○ DHCP ● Static

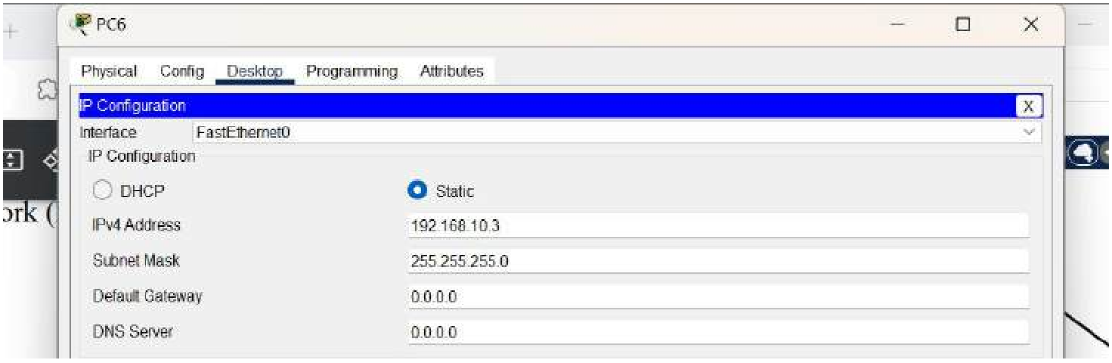
IPv4 Address 192.168.10.2

Subnet Mask 255.255.255.0

Default Gateway 0.0.0.0

DNS Server 0.0.0.0

PC6:-



IP Configuration

Interface FastEthernet0

IP Configuration

○ DHCP ● Static

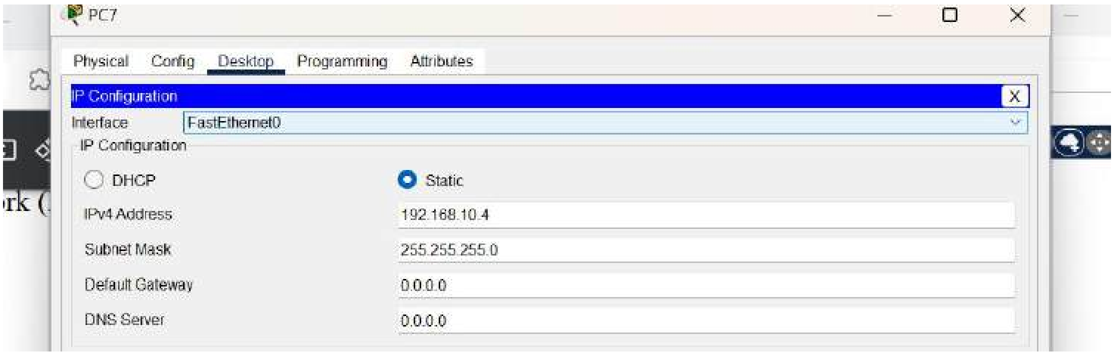
IPv4 Address 192.168.10.3

Subnet Mask 255.255.255.0

Default Gateway 0.0.0.0

DNS Server 0.0.0.0

PC7:-



Interface: FastEthernet0

IP Configuration

○ DHCP ● Static

IPv4 Address: 192.168.10.4

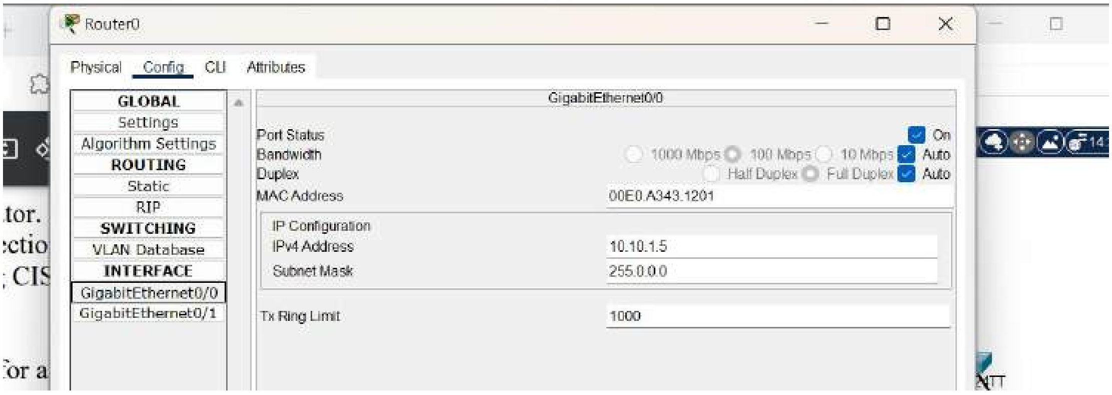
Subnet Mask: 255.255.255.0

Default Gateway: 0.0.0.0

DNS Server: 0.0.0.0

B)

ROUTER 0:



GigabitEthernet0/0

Port Status ☑ On

Bandwidth ○ 1000 Mbps ○ 100 Mbps ○ 10 Mbps ☑ Auto

Duplex ○ Half Duplex ○ Full Duplex ☑ Auto

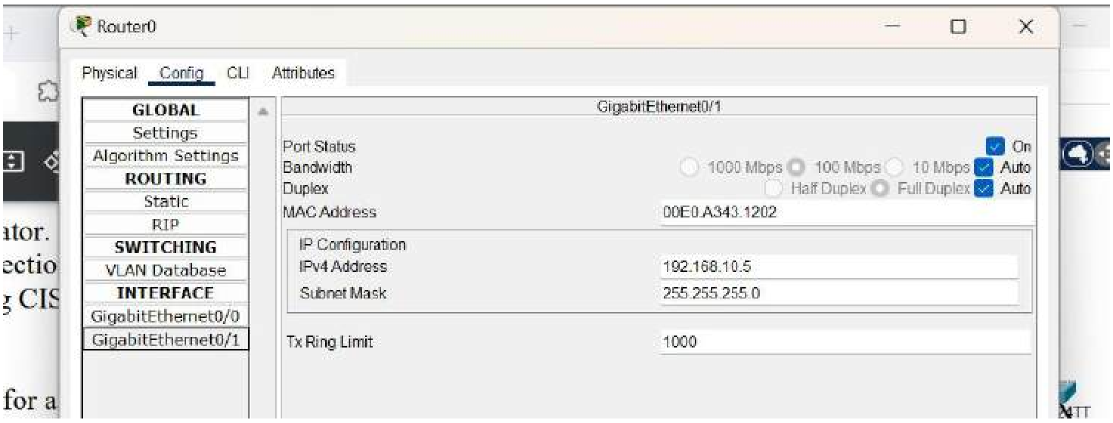
MAC Address: 00E0.A343.1201

IP Configuration

IPv4 Address: 10.10.1.5

Subnet Mask: 255.0.0.0

Tx Ring Limit: 1000



GigabitEthernet0/1

Port Status ☑ On

Bandwidth ○ 1000 Mbps ○ 100 Mbps ○ 10 Mbps ☑ Auto

Duplex ○ Half Duplex ○ Full Duplex ☑ Auto

MAC Address: 00E0.A343.1202

IP Configuration

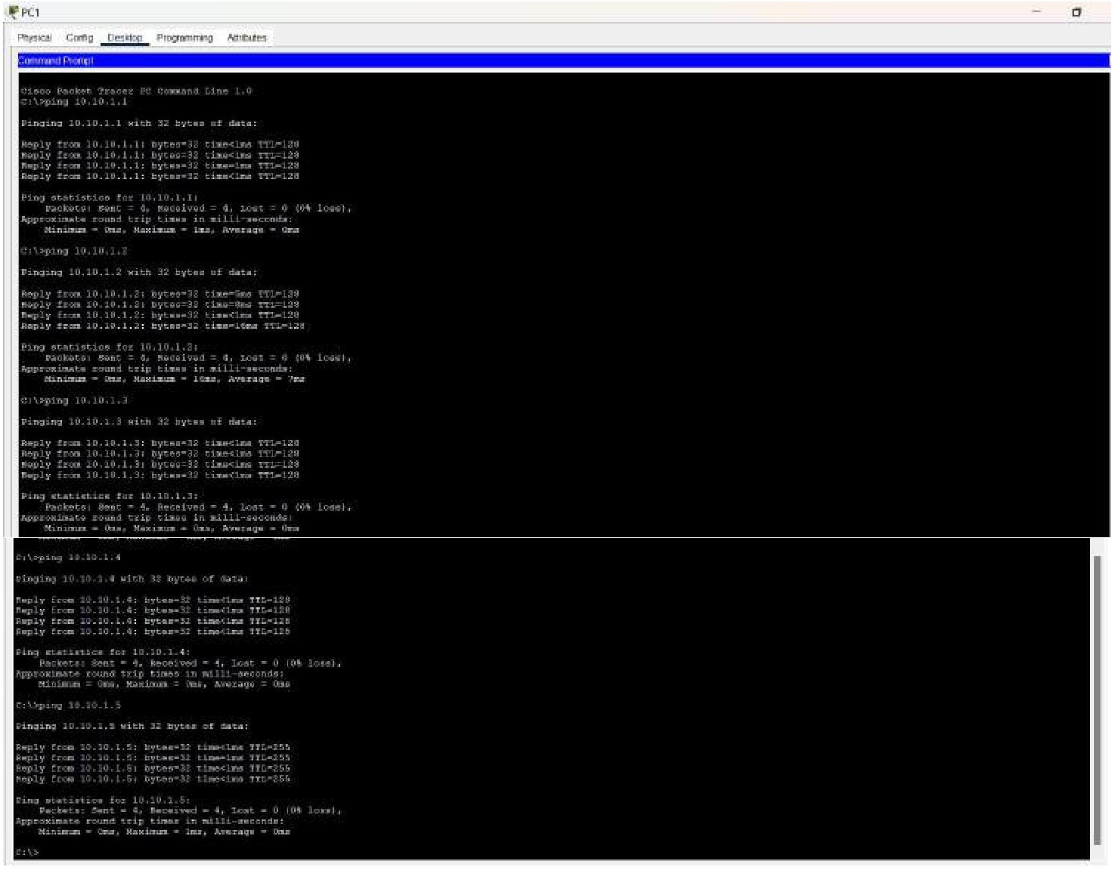
IPv4 Address: 192.168.10.5

Subnet Mask: 255.255.255.0

Tx Ring Limit: 1000

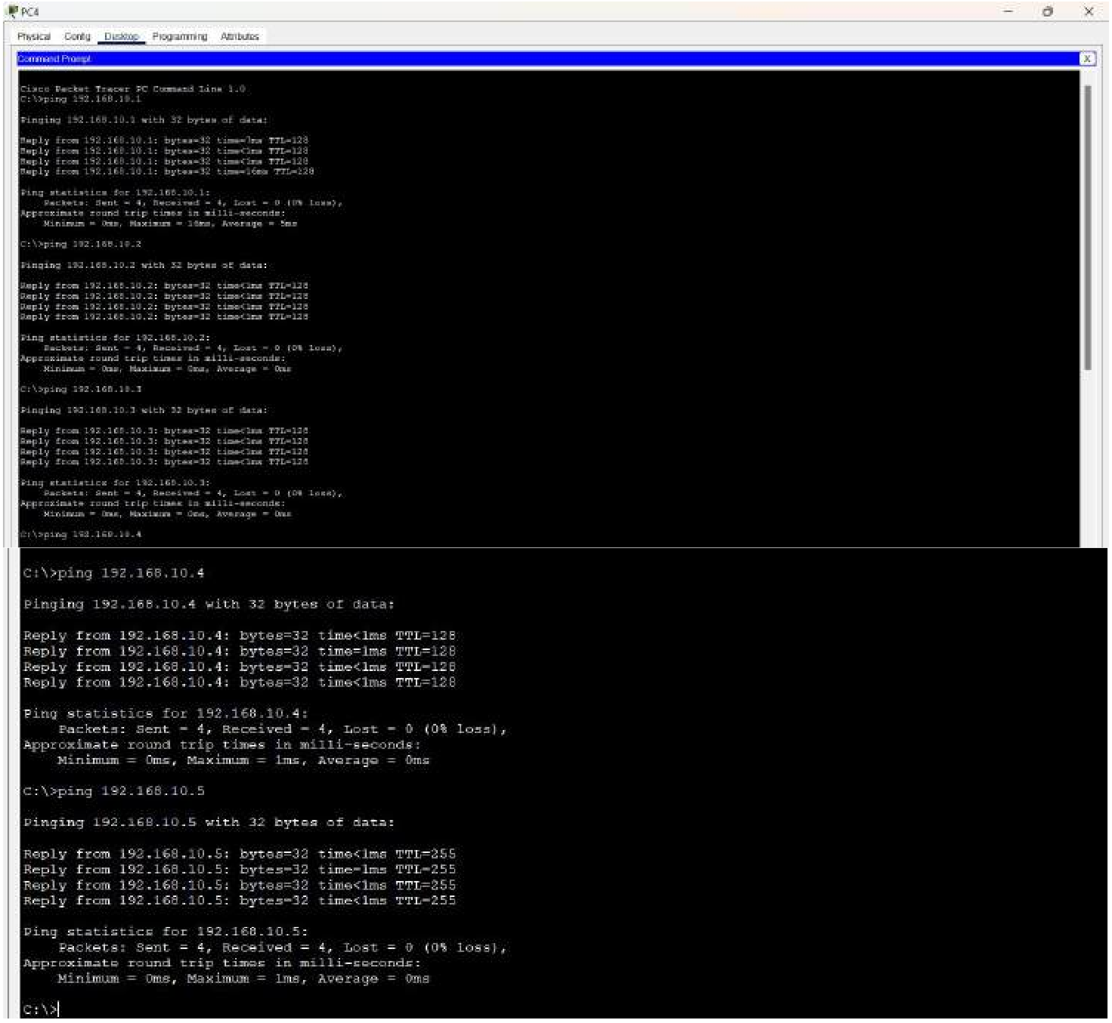
C)

NETWORK 10.10.1:-



```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 10.10.1.1

Pinging 10.10.1.1 with 32 bytes of data:

Reply from 10.10.1.1: bytes=32 time<1ms TTL=128
Reply from 10.10.1.1: bytes=32 time<1ms TTL=128
Reply from 10.10.1.1: bytes=32 time=1ms TTL=128
Reply from 10.10.1.1: bytes=32 time<1ms TTL=128

Ping statistics for 10.10.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>ping 10.10.1.2

Pinging 10.10.1.2 with 32 bytes of data:

Reply from 10.10.1.2: bytes=32 time=6ms TTL=128
Reply from 10.10.1.2: bytes=32 time=8ms TTL=128
Reply from 10.10.1.2: bytes=32 time<1ms TTL=128
Reply from 10.10.1.2: bytes=32 time=16ms TTL=128

Ping statistics for 10.10.1.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 16ms, Average = 7ms

C:\>ping 10.10.1.3

Pinging 10.10.1.3 with 32 bytes of data:

Reply from 10.10.1.3: bytes=32 time<1ms TTL=128
Reply from 10.10.1.3: bytes=32 time<1ms TTL=128
Reply from 10.10.1.3: bytes=32 time<1ms TTL=128
Reply from 10.10.1.3: bytes=32 time<1ms TTL=128

Ping statistics for 10.10.1.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 10.10.1.4

Pinging 10.10.1.4 with 32 bytes of data:

Reply from 10.10.1.4: bytes=32 time<1ms TTL=128
Reply from 10.10.1.4: bytes=32 time<1ms TTL=128
Reply from 10.10.1.4: bytes=32 time<1ms TTL=128
Reply from 10.10.1.4: bytes=32 time<1ms TTL=128

Ping statistics for 10.10.1.4:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 10.10.1.5

Pinging 10.10.1.5 with 32 bytes of data:

Reply from 10.10.1.5: bytes=32 time<1ms TTL=255
Reply from 10.10.1.5: bytes=32 time=1ms TTL=255
Reply from 10.10.1.5: bytes=32 time<1ms TTL=255
Reply from 10.10.1.5: bytes=32 time<1ms TTL=255

Ping statistics for 10.10.1.5:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>
```

NETWORK 192.168.10:-

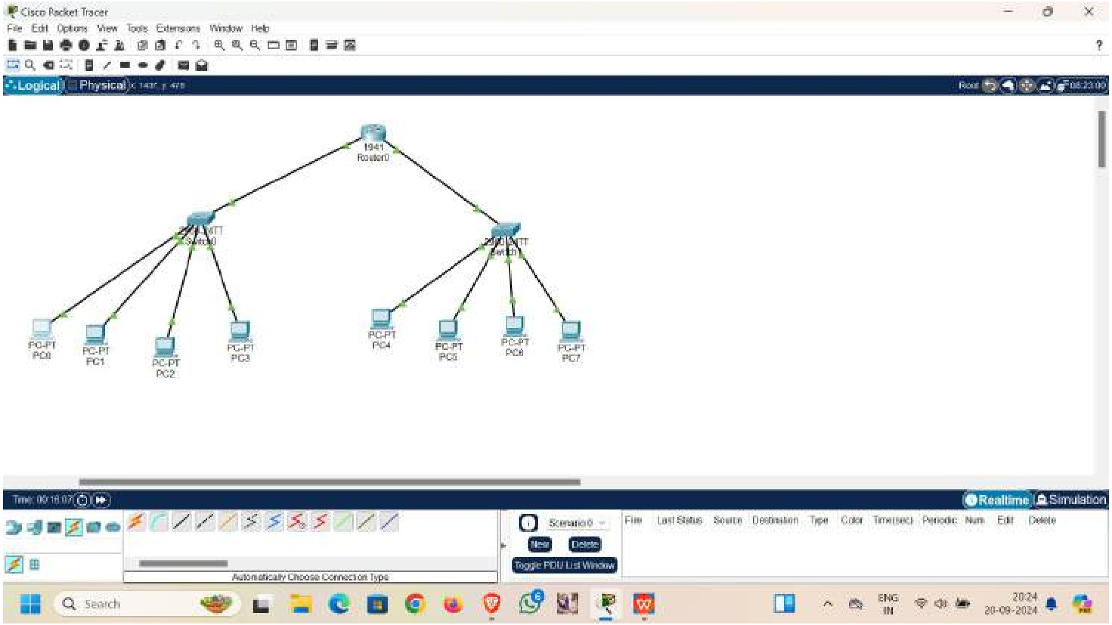


```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.10.1

Pinging 192.168.10.1 with 32 bytes of data:

Reply from 192.168.10.1: bytes=32 time=7ms TTL=128
Reply from 192.168.10.1: bytes=32 time<1ms TTL=128
Reply from 192.168.10.1: bytes=32 time<1ms TTL=128
Reply from 192.168.10.1: bytes=32 time=16ms TTL=128

Ping statistics for 192.168.10.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 16ms, Average = 5ms

C:\>ping 192.168.10.2

Pinging 192.168.10.2 with 32 bytes of data:

Reply from 192.168.10.2: bytes=32 time<1ms TTL=128
Reply from 192.168.10.2: bytes=32 time<1ms TTL=128
Reply from 192.168.10.2: bytes=32 time<1ms TTL=128
Reply from 192.168.10.2: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.10.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.10.3

Pinging 192.168.10.3 with 32 bytes of data:

Reply from 192.168.10.3: bytes=32 time<1ms TTL=128
Reply from 192.168.10.3: bytes=32 time<1ms TTL=128
Reply from 192.168.10.3: bytes=32 time<1ms TTL=128
Reply from 192.168.10.3: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.10.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.10.4
```

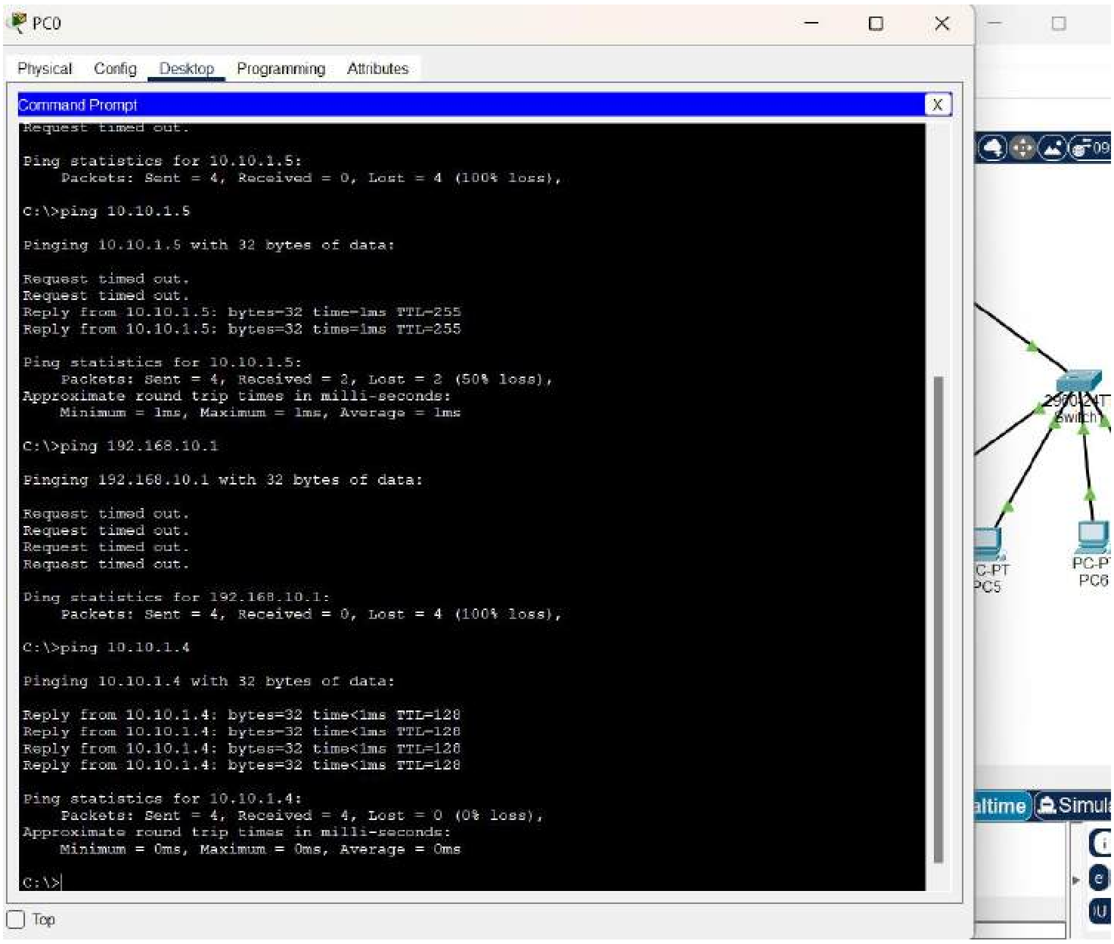
```
C:\>ping 192.168.10.4

Pinging 192.168.10.4 with 32 bytes of data:

Reply from 192.168.10.4: bytes=32 time<1ms TTL=128
Reply from 192.168.10.4: bytes=32 time=1ms TTL=128
Reply from 192.168.10.4: bytes=32 time<1ms TTL=128
Reply from 192.168.10.4: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.10.4:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>ping 192.168.10.5

Pinging 192.168.10.5 with 32 bytes of data:

Reply from 192.168.10.5: bytes=32 time<1ms TTL=255
Reply from 192.168.10.5: bytes=32 time=1ms TTL=255
Reply from 192.168.10.5: bytes=32 time<1ms TTL=255
Reply from 192.168.10.5: bytes=32 time<1ms TTL=255

Ping statistics for 192.168.10.5:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>
```

D)

DIAGRAM:-

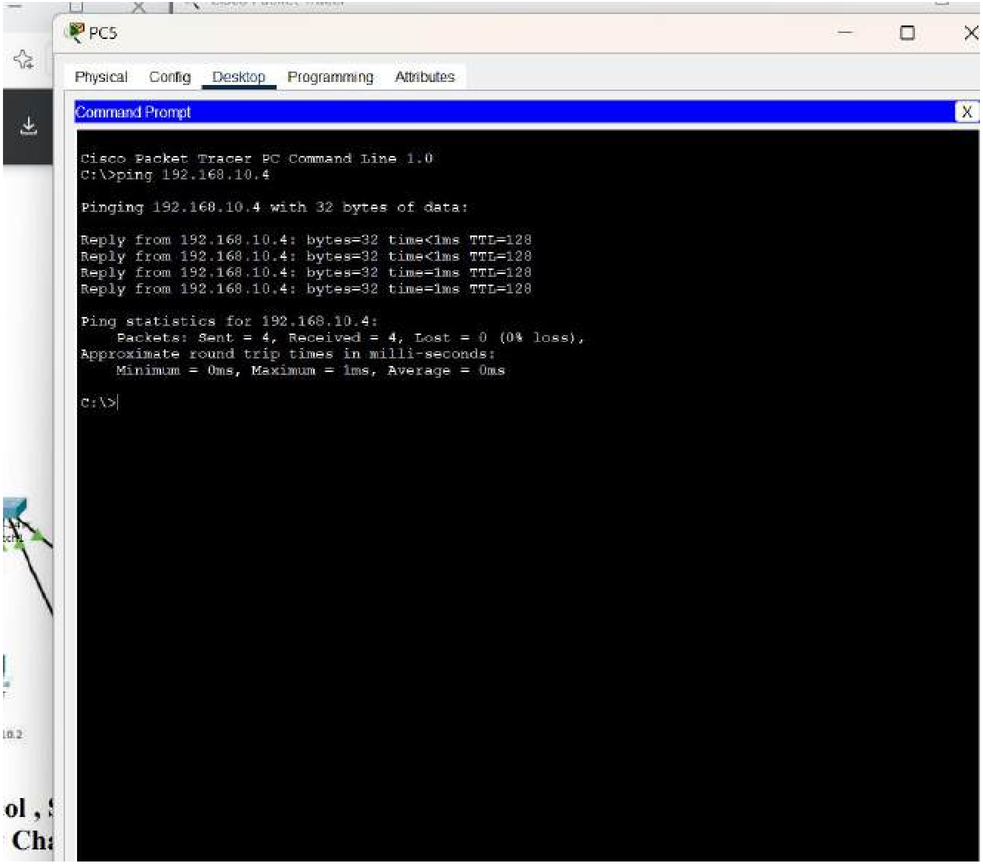


A) PC0 TO PC3:-



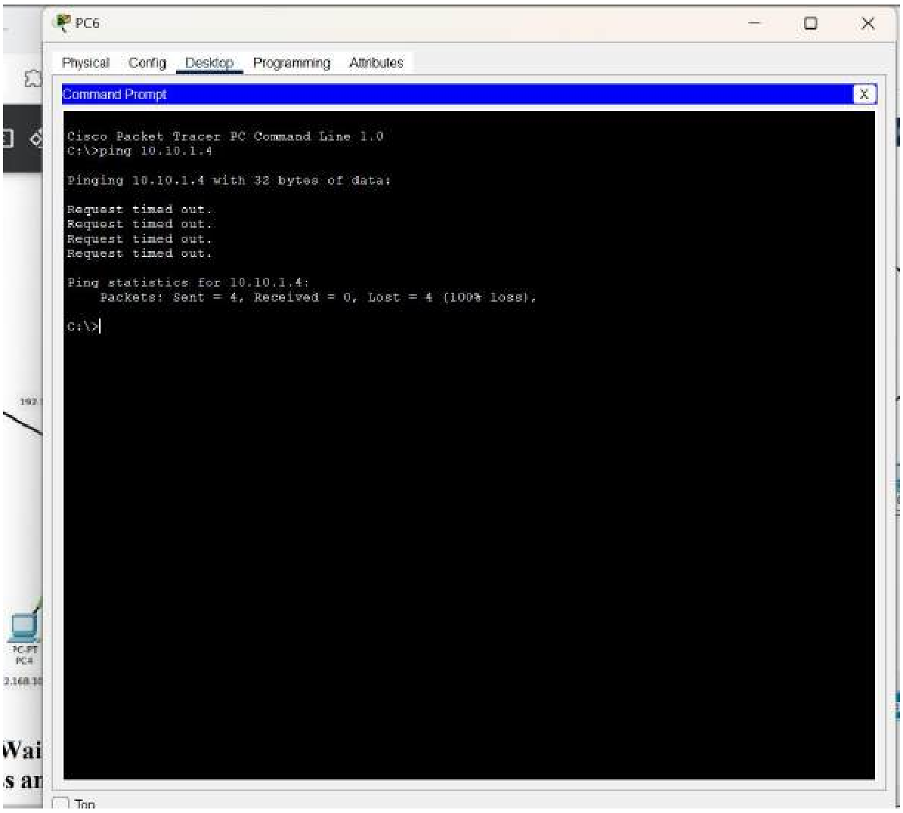
```
Request timed out.

Ping statistics for 10.10.1.5:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>ping 10.10.1.5

Pinging 10.10.1.5 with 32 bytes of data:

Request timed out.
Request timed out.
Reply from 10.10.1.5: bytes=32 time=1ms TTL=255
Reply from 10.10.1.5: bytes=32 time=1ms TTL=255

Ping statistics for 10.10.1.5:
    Packets: Sent = 4, Received = 2, Lost = 2 (50% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms

C:\>ping 192.168.10.1

Pinging 192.168.10.1 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 192.168.10.1:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>ping 10.10.1.4

Pinging 10.10.1.4 with 32 bytes of data:

Reply from 10.10.1.4: bytes=32 time<1ms TTL=128
Reply from 10.10.1.4: bytes=32 time<1ms TTL=128
Reply from 10.10.1.4: bytes=32 time<1ms TTL=128
Reply from 10.10.1.4: bytes=32 time<1ms TTL=128

Ping statistics for 10.10.1.4:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```

B) PC5 TO PC7



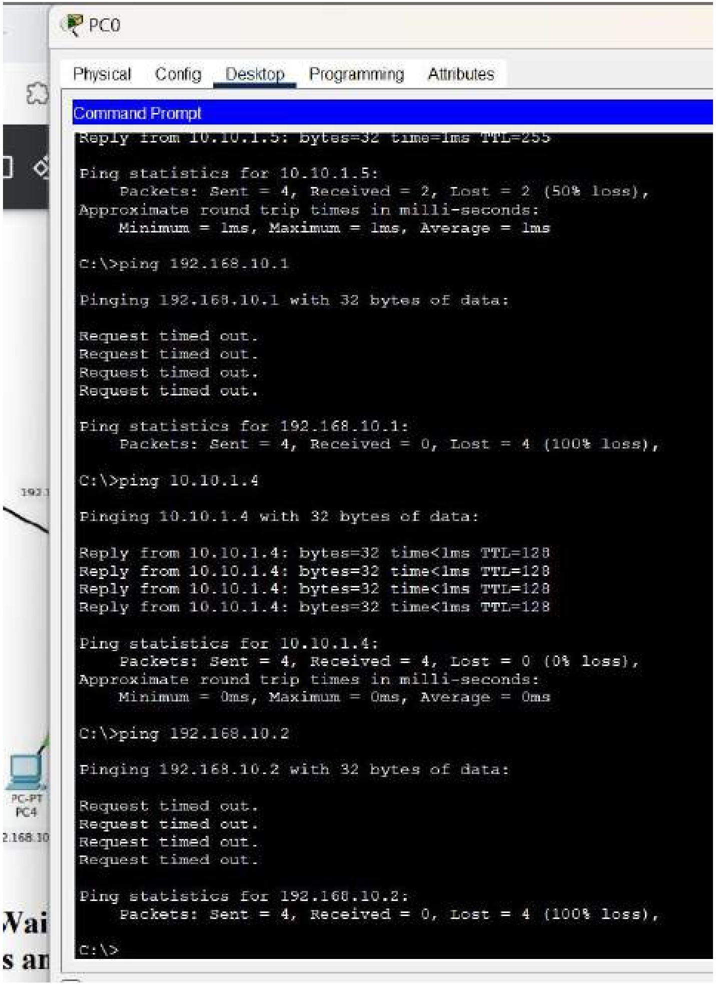
```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.10.4

Pinging 192.168.10.4 with 32 bytes of data:

Reply from 192.168.10.4: bytes=32 time<1ms TTL=128
Reply from 192.168.10.4: bytes=32 time<1ms TTL=128
Reply from 192.168.10.4: bytes=32 time=1ms TTL=128
Reply from 192.168.10.4: bytes=32 time=1ms TTL=128

Ping statistics for 192.168.10.4:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>
```

C) PC 6 TO PC 3



```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 10.10.1.4

Pinging 10.10.1.4 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 10.10.1.4:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>
```

D) PC1 TO PC5



```
Reply from 10.10.1.5: bytes=32 time=1ms TTL=255

Ping statistics for 10.10.1.5:
    Packets: Sent = 4, Received = 2, Lost = 2 (50% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms

C:\>ping 192.168.10.1

Pinging 192.168.10.1 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 192.168.10.1:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>ping 10.10.1.4

Pinging 10.10.1.4 with 32 bytes of data:

Reply from 10.10.1.4: bytes=32 time<1ms TTL=128
Reply from 10.10.1.4: bytes=32 time<1ms TTL=128
Reply from 10.10.1.4: bytes=32 time<1ms TTL=128
Reply from 10.10.1.4: bytes=32 time<1ms TTL=128

Ping statistics for 10.10.1.4:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.10.2

Pinging 192.168.10.2 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 192.168.10.2:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>
```

RegNo: 22BCT0001

Name: V.V.S.Vignesh

1) STOP AND WAIT ARQ NOISELESS CHANNEL

```
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <unistd.h>
#include <arpa/inet.h>

#define PORT 8080
#define BUFFER_SIZE 1024

int main() {
  int sock = 0;
  struct sockaddr_in serv_addr;
  char buffer[BUFFER_SIZE] = {0};

  // Creating socket file descriptor
  if ((sock = socket(AF_INET, SOCK_STREAM, 0)) < 0)
    { printf("Socket creation error\n");
    return -1;
  }

  serv_addr.sin_family = AF_INET;
  serv_addr.sin_port = htons(PORT);

  // Convert IPv4 and IPv6 addresses from text to binary form
  if (inet_pton(AF_INET, "127.0.0.1", &serv_addr.sin_addr) <= 0)
    { printf("Invalid address/ Address not supported\n");
    return -1;
  }

  // Connect to the server
  if (connect(sock, (struct sockaddr *)&serv_addr, sizeof(serv_addr)) < 0)
    { printf("Connection Failed\n");
    return -1;
  }

  // Messages to send
  char *messages[] = {"Hello, Server!", "How are you?", "Goodbye!"};
  int num_messages = 3;

  // Send data to the server using Stop-and-
  Wait for (int i = 0; i < num_messages; i++) {
    // Send the message to the server
    send(sock, messages[i], strlen(messages[i]), 0);
    printf("Message sent: %s\n", messages[i]);
```

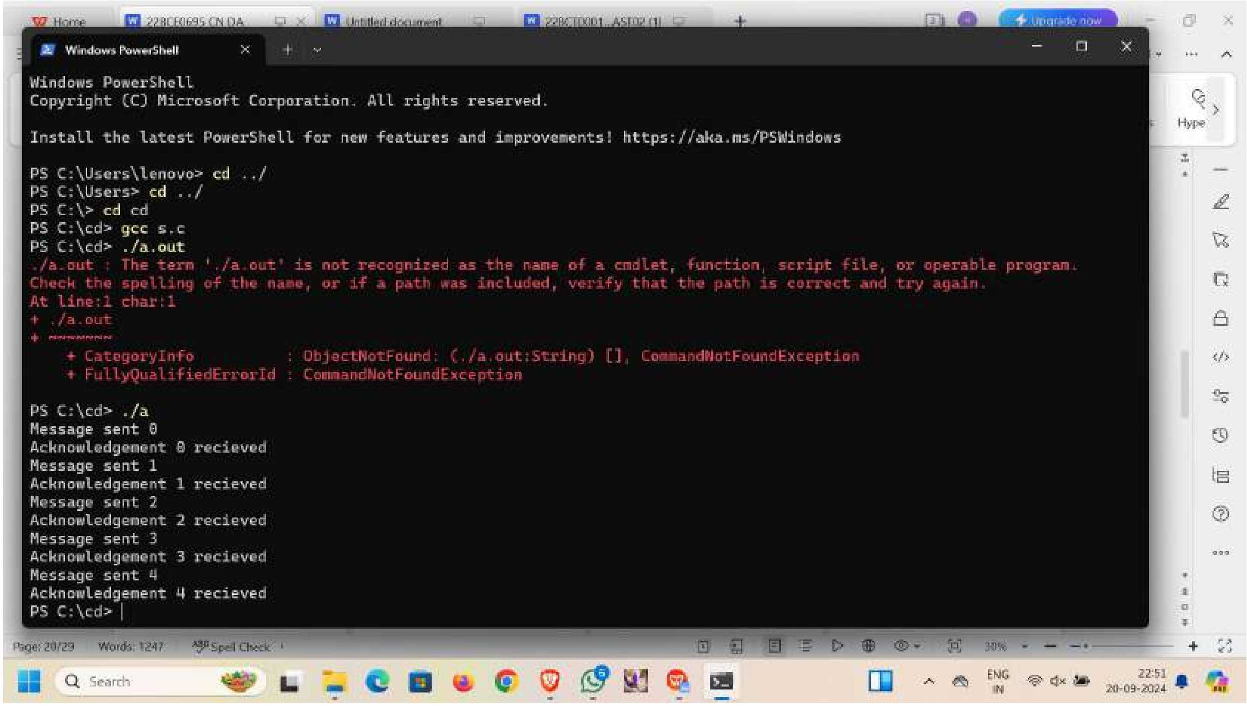
```
// Wait for acknowledgment
memset(buffer, 0, BUFFER_SIZE);
read(sock, buffer, BUFFER_SIZE);
```

```
        printf("Acknowledgment received: %s\n", buffer);
    }

    // Close the connection
    close(sock);
    return 0;
}
```

server:

```
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <unistd.h>
#include <arpa/inet.h>

#define PORT 8080
#define BUFFER_SIZE 1024

int main() {
    int server_fd, new_socket;
    struct sockaddr_in address;
    int addrlen = sizeof(address);
    char buffer[BUFFER_SIZE] = {0};

    // Creating socket file descriptor
    if ((server_fd = socket(AF_INET, SOCK_STREAM, 0)) == 0)
        { perror("Socket failed");
        exit(EXIT_FAILURE);
    }

    // Set the server address and port
    address.sin_family = AF_INET;
    address.sin_addr.s_addr = INADDR_ANY;
    address.sin_port = htons(PORT);

    // Bind the socket to the address and port
    if (bind(server_fd, (struct sockaddr *)&address, sizeof(address)) < 0)
        { perror("Bind failed");
        close(server_fd);
        exit(EXIT_FAILURE);
    }

    // Listen for incoming connections
    if (listen(server_fd, 3) < 0) {
        perror("Listen failed");
        close(server_fd);
        exit(EXIT_FAILURE);
    }

    printf("Server is listening on port %d\n", PORT);

    // Accept a connection
    if ((new_socket = accept(server_fd, (struct sockaddr *)&address, (socklen_t*)&addrlen)) <
0) {
        perror("Accept failed");
        close(server_fd);
        exit(EXIT_FAILURE);
    }

    // Receive data from the client with Stop-and-Wait
    while (1) {
        memset(buffer, 0, BUFFER_SIZE);
        int bytes_read = read(new_socket, buffer, BUFFER_SIZE); if
        (bytes_read == 0) {
            break; // Client closed the connection
        }
        printf("Received: %s\n", buffer);

        // Send acknowledgment to the client
        char ack[] = "ACK"; send(new_socket,
        ack, strlen(ack), 0);
        printf("Acknowledgment sent\n");
    }

    // Close the connection
    close(new_socket);
    close(server_fd); return 0;
}
```

<u>OUTPUT:-</u>



```
Windows PowerShell
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Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows

PS C:\Users\lenovo> cd ../
PS C:\Users> cd ../
PS C:\> cd cd
PS C:\cd> gcc s.c
PS C:\cd> ./a.out
./a.out : The term './a.out' is not recognized as the name of a cmdlet, function, script file, or operable program.
Check the spelling of the name, or if a path was included, verify that the path is correct and try again.
At line:1 char:1
+ ./a.out
+ ~~~~~~~
    + CategoryInfo          : ObjectNotFound: (./a.out:String) [], CommandNotFoundException
    + FullyQualifiedErrorId : CommandNotFoundException

PS C:\cd> ./a
Message sent 0
Acknowledgement 0 recieved
Message sent 1
Acknowledgement 1 recieved
Message sent 2
Acknowledgement 2 recieved
Message sent 3
Acknowledgement 3 recieved
Message sent 4
Acknowledgement 4 recieved
PS C:\cd> |
```

2)Stop and wait ARQ

Server:

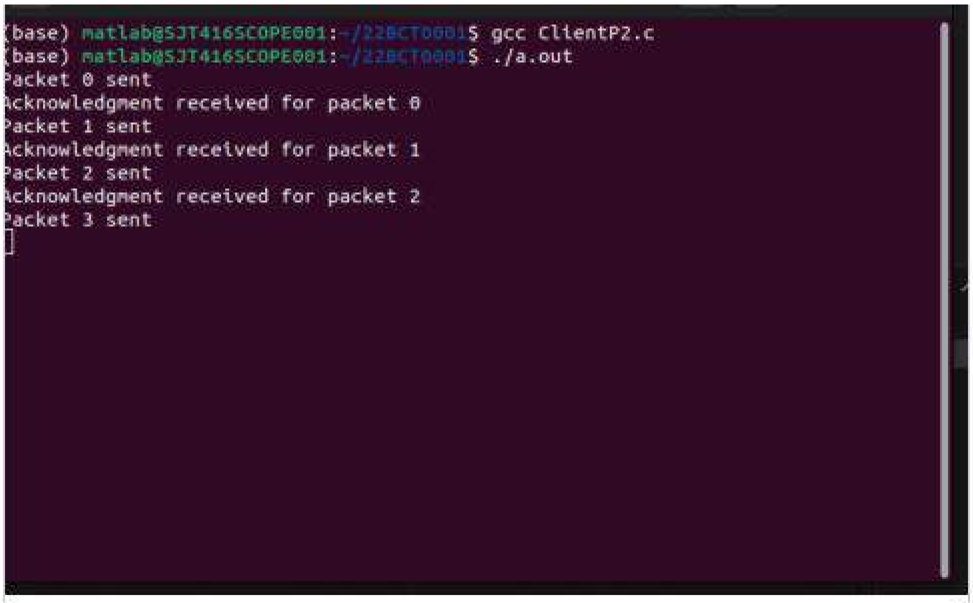
```
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <unistd.h>
#include <arpa/inet.h>
#define PORT 8080
#define BUFFER_SIZE 1024
#define LOSS_PROBABILITY 20
int is_packet_lost() {
return rand() % 100 < LOSS_PROBABILITY;
}
int main() {
int server_fd, new_socket;
struct sockaddr_in address;
int addrlen = sizeof(address);
char buffer[BUFFER_SIZE] = {0};
int expected_seq_num = 0;
if ((server_fd = socket(AF_INET, SOCK_STREAM, 0)) == 0)
{ perror("Socket creation failed");
exit(EXIT_FAILURE);
}
address.sin_family = AF_INET;
address.sin_addr.s_addr = INADDR_ANY;
address.sin_port = htons(PORT);
if (bind(server_fd, (struct sockaddr *)&address, sizeof(address)) < 0)
{ perror("Bind failed");
close(server_fd);
exit(EXIT_FAILURE);
}
if (listen(server_fd, 3) < 0) {
perror("Listen failed");
close(server_fd);
exit(EXIT_FAILURE);
}
printf("Server is listening on port %d \n", PORT);
if ((new_socket = accept(server_fd, (struct sockaddr *)&address,
(socklen_t*)&addrlen)) < 0) {
perror("Accept failed");
close(server_fd);
exit(EXIT_FAILURE);
}
while (1) {
```

```
memset(buffer, 0, BUFFER_SIZE);
int bytes_read = read(new_socket, buffer, BUFFER_SIZE); if
(bytes_read > 0) {
int seq_num = atoi(buffer);
printf("Received packet with sequence number: %d\n", seq_num); if
(seq_num == expected_seq_num && !is_packet_lost())
{ printf("Packet %d received correctly. \n", seq_num); sprintf(buffer,
"ACK %d", seq_num);

send(new_socket, buffer, strlen(buffer), 0);
printf("Acknowledgment sent for packet %d.\n", seq_num);
expected_seq_num++;
} else {
printf("Packet %d lost or corrupted. \n", seq_num);
}
}
}
close(new_socket);
close(server_fd);
return 0;
}
```

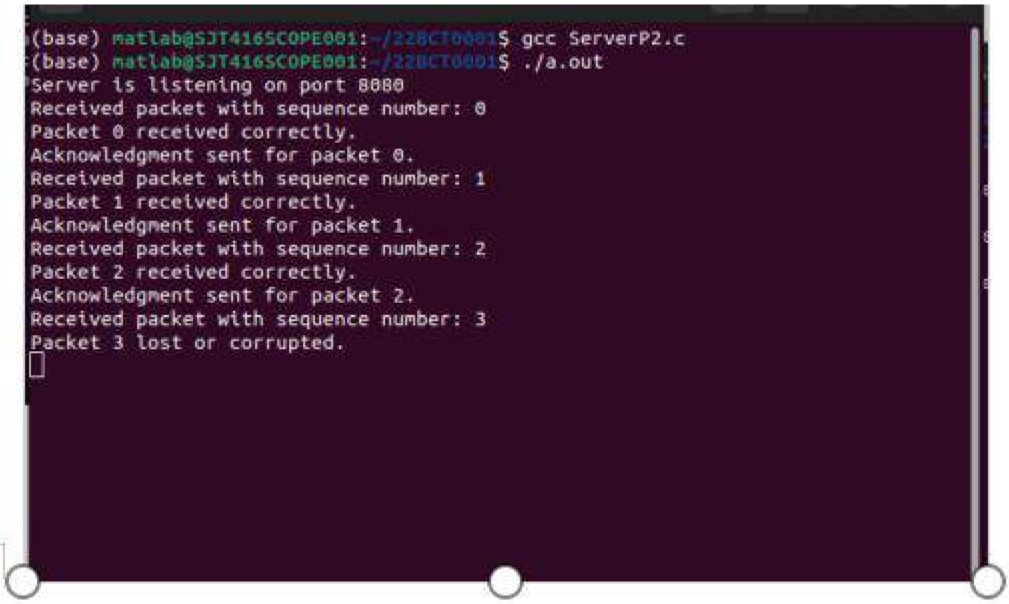
Client:

```
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <unistd.h>
#include <arpa/inet.h>
#include <sys/time.h>
#define PORT 8080
#define BUFFER_SIZE 1024
#define TIMEOUT 2
int has_timed_out(struct timeval start_time) { struct
timeval current_time; gettimeofday(&current_time,
NULL);
if ((current_time.tv_sec - start_time.tv_sec) >= TIMEOUT) {
return 1;
}
return 0;
}
int main() {
int sock = 0;
struct sockaddr_in serv_addr;
char buffer[BUFFER_SIZE] = {0};
int seq_num = 0;
if ((sock = socket(AF_INET, SOCK_STREAM, 0)) < 0)
{ printf("Socket creation error\n");
return -1;
}
serv_addr.sin_family = AF_INET;
serv_addr.sin_port = htons(PORT);
if (inet_pton(AF_INET, "127.0.0.1", &serv_addr.sin_addr) <= 0)
{ printf("Invalid address/ Address not supported\n");
return -1;
}
if (connect(sock, (struct sockaddr *)&serv_addr, sizeof(serv_addr)) < 0)
{ printf("Connection Failed\n");
return -1;
}
while (seq_num < 10) {
struct timeval start_time;
gettimeofday(&start_time, NULL);
sprintf(buffer, "%d", seq_num);
send(sock, buffer, strlen(buffer), 0);
printf("Packet %d sent\n", seq_num);
while (1) {
memset(buffer, 0, BUFFER_SIZE);
int bytes_read = read(sock, buffer, BUFFER_SIZE); if
(bytes_read > 0) {
int ack_num;
sscanf(buffer, "ACK %d", &ack_num);
if (ack_num == seq_num) {
printf("Acknowledgment received for packet %d\n", seq_num);
seq_num++;
break;
}
}

if (has_timed_out(start_time)) {
printf("Timeout for packet %d. Retransmitting...\n", seq_num);
send(sock, buffer, strlen(buffer), 0); gettimeofday(&start_time, NULL);

}
}
}
close(sock);
return 0;
}
```

Output:



```
(base) matlab@SJT416SCOPE001:~/22BCT0001$ gcc ClientP2.c
(base) matlab@SJT416SCOPE001:~/22BCT0001$ ./a.out
Packet 0 sent
Acknowledgment received for packet 0
Packet 1 sent
Acknowledgment received for packet 1
Packet 2 sent
Acknowledgment received for packet 2
Packet 3 sent
```



```
(base) matlab@SJT416SCOPE001:~/22BCT0001$ gcc ServerP2.c
(base) matlab@SJT416SCOPE001:~/22BCT0001$ ./a.out
Server is listening on port 8080
Received packet with sequence number: 0
Packet 0 received correctly.
Acknowledgment sent for packet 0.
Received packet with sequence number: 1
Packet 1 received correctly.
Acknowledgment sent for packet 1.
Received packet with sequence number: 2
Packet 2 received correctly.
Acknowledgment sent for packet 2.
Received packet with sequence number: 3
Packet 3 lost or corrupted.
```

2
3))
Select ive Repeate ARQ

Server:

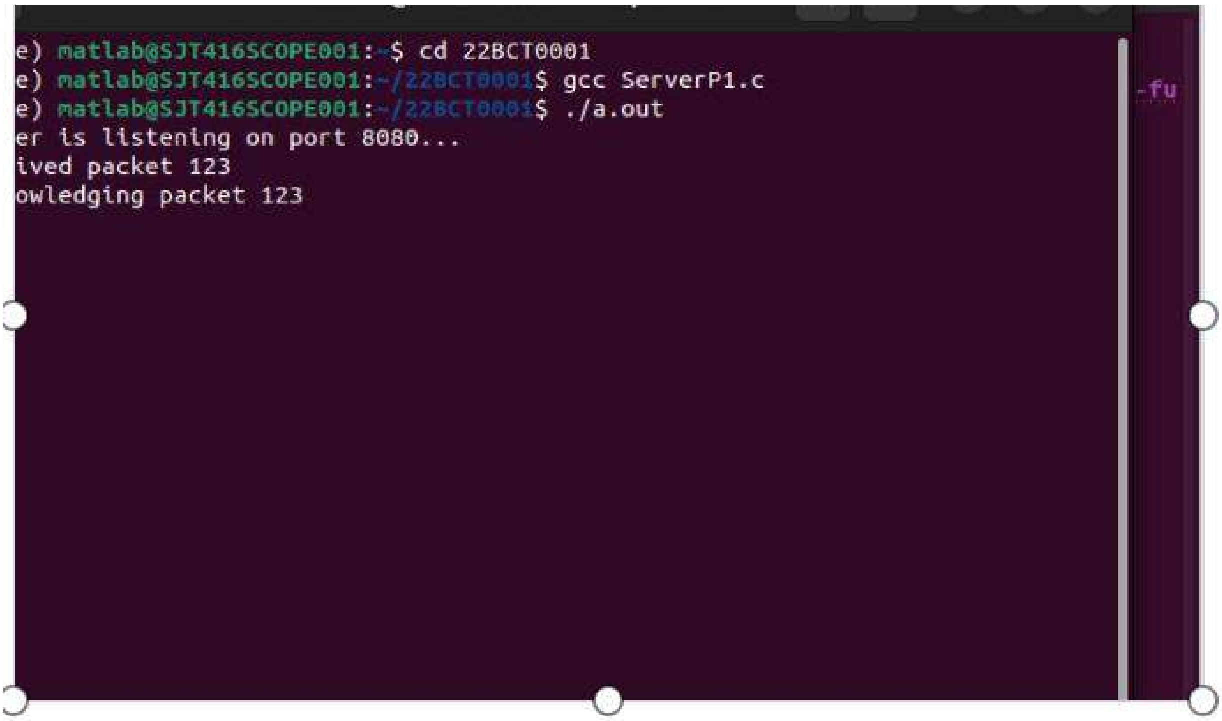
```
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <unistd.h>
#include <arpa/inet.h>
#define PORT 8080
#define BUFFER_SIZE 1024
#define TOTAL_PACKETS 10
int main() {
int server_fd, new_socket;
struct sockaddr_in address;
int addrlen = sizeof(address);
char buffer[BUFFER_SIZE] = {0};
int expected_seq_num = 0;
int received[TOTAL_PACKETS] = {0};
// Create socket
if ((server_fd = socket(AF_INET, SOCK_STREAM, 0)) == 0)
{ perror("Socket creation failed");
exit(EXIT_FAILURE);
}
address.sin_family = AF_INET;
address.sin_addr.s_addr = INADDR_ANY;
address.sin_port = htons(PORT);
if (bind(server_fd, (struct sockaddr *)&address, sizeof(address)) < 0)
{ perror("Bind failed");
close(server_fd);
exit(EXIT_FAILURE);
}
if (listen(server_fd, 3) < 0) {
perror("Listen failed");
close(server_fd);
exit(EXIT_FAILURE);
}
printf("Server is listening on port %d...\n", PORT);

if ((new_socket = accept(server_fd, (struct sockaddr *)&address,
(socklen_t*)&addrlen)) < 0) {
perror("Accept failed");
close(server_fd);
exit(EXIT_FAILURE);
}

while (expected_seq_num < TOTAL_PACKETS)
{ memset(buffer, 0, BUFFER_SIZE);
int bytes_read = read(new_socket, buffer, BUFFER_SIZE); if
(bytes_read > 0) {
```

```
int seq_num = atoi(buffer);
printf("Received packet %d\n", seq_num);
if (!received[seq_num]) {
received[seq_num] = 1;
printf("Acknowledging packet %d\n", seq_num);
sprintf(buffer, "ACK %d", seq_num);
send(new_socket, buffer, strlen(buffer), 0);
}
}
}
printf("All packets received. Closing connection.\n");
close(new_socket);
close(server_fd);
return 0;
}
```

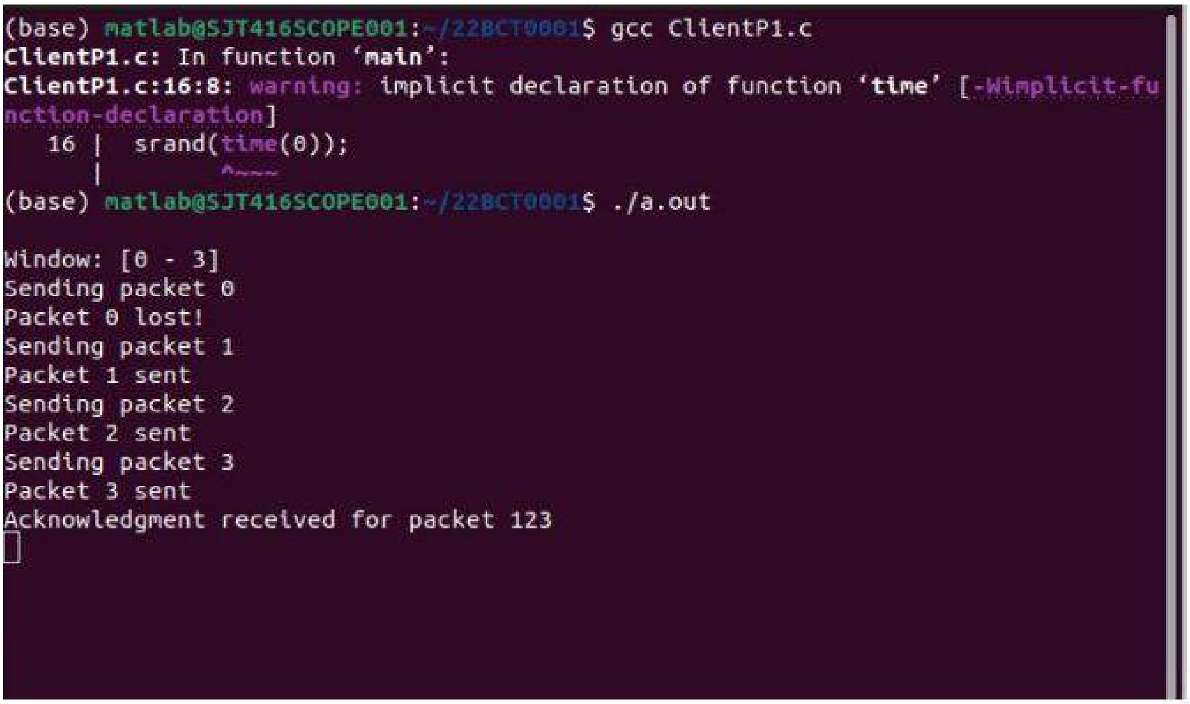
Client:

```
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <unistd.h>
#include <arpa/inet.h>
#define PORT 8080
#define BUFFER_SIZE 1024
#define TOTAL_PACKETS 10
#define WINDOW_SIZE 4

int is_packet_lost() {
return rand() % 100 < 20;
}
int main() {
srand(time(0));
int sock = 0;
struct sockaddr_in serv_addr;
char buffer[BUFFER_SIZE] = {0};
int packets[TOTAL_PACKETS] = {0};
int acks[TOTAL_PACKETS] = {0};
int base = 0;

if ((sock = socket(AF_INET, SOCK_STREAM, 0)) < 0)
{ printf("Socket creation error\n");
return -1;
}
serv_addr.sin_family = AF_INET;
serv_addr.sin_port = htons(PORT);
if (inet_pton(AF_INET, "127.0.0.1", &serv_addr.sin_addr) <= 0)
{ printf("Invalid address/ Address not supported\n");
return -1;
}
if (connect(sock, (struct sockaddr *)&serv_addr, sizeof(serv_addr)) < 0)
{ printf("Connection Failed\n");
return -1;
}
while (base < TOTAL_PACKETS) {
printf("\nWindow: [%d - %d]\n", base, base + WINDOW_SIZE - 1);
for (int i = base; i < base + WINDOW_SIZE && i < TOTAL_PACKETS; i++) { if
(!packets[i]) {
printf("Sending packet %d\n", i);
if (is_packet_lost()) {
printf("Packet %d lost!\n", i);
} else {
sprintf(buffer, "%d", i);
send(sock, buffer, strlen(buffer), 0);
printf("Packet %d sent\n", i);
}
packets[i] = 1;
}
}
for (int i = base; i < base + WINDOW_SIZE && i < TOTAL_PACKETS; i++)
{ memset(buffer, 0, BUFFER_SIZE);
int bytes_read = read(sock, buffer, BUFFER_SIZE); if
(bytes_read > 0) {
int ack_num;
sscanf(buffer, "ACK %d", &ack_num);
printf("Acknowledgment received for packet %d\n", ack_num);
acks[ack_num] = 1;
}
}
while (acks[base] && base < TOTAL_PACKETS)
{ base++;
}
}
printf("All packets sent and acknowledged. Closing connection.\n");
close(sock);
return 0;
}
```

Output:



```
e) matlab@SJT416SCOPE001:~$ cd 22BCT0001
e) matlab@SJT416SCOPE001:~/22BCT0001$ gcc ServerP1.c
e) matlab@SJT416SCOPE001:~/22BCT0001$ ./a.out
er is listening on port 8080...
ived packet 123
owledging packet 123
```



```
(base) matlab@SJT416SCOPE001:~/22BCT0001$ gcc ClientP1.c
ClientP1.c: In function ‘main’:
ClientP1.c:16:8: warning: implicit declaration of function ‘time’ [-Wimplicit-fu
nction-declaration]
   16 |   srand(time(0));
      |         ^~~~
(base) matlab@SJT416SCOPE001:~/22BCT0001$ ./a.out

Window: [0 - 3]
Sending packet 0
Packet 0 lost!
Sending packet 1
Packet 1 sent
Sending packet 2
Packet 2 sent
Sending packet 3
Packet 3 sent
Acknowledgment received for packet 123
```