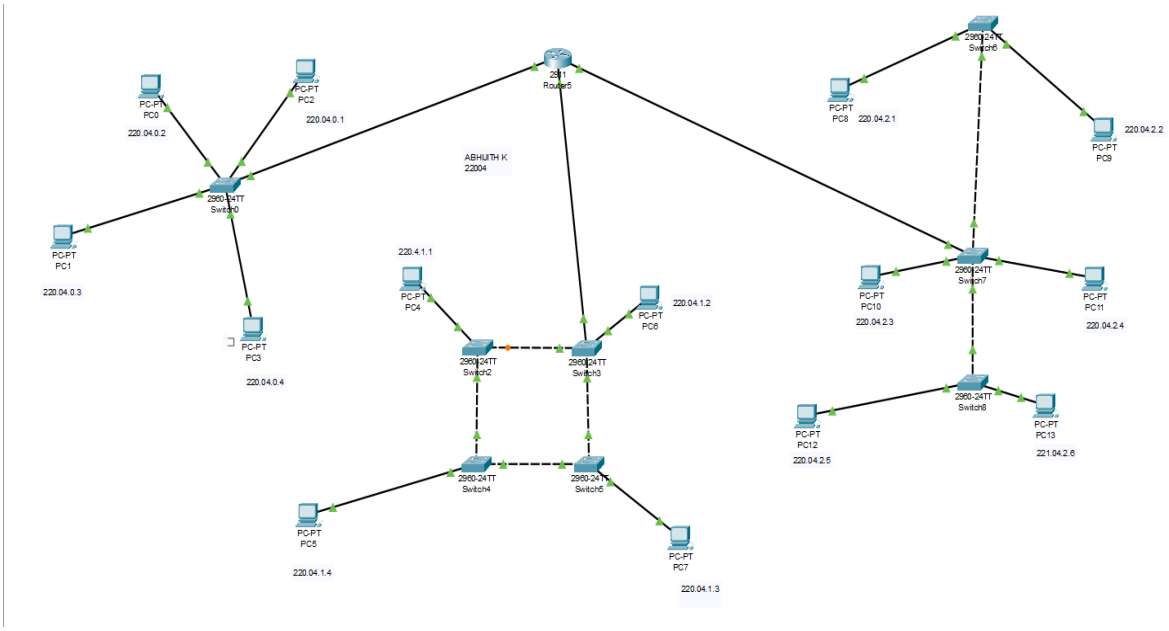
19-ECE311 COMPUTER NETWORKS
ASSIGNMENT 1 – Q2

Name:ABHIJITH K

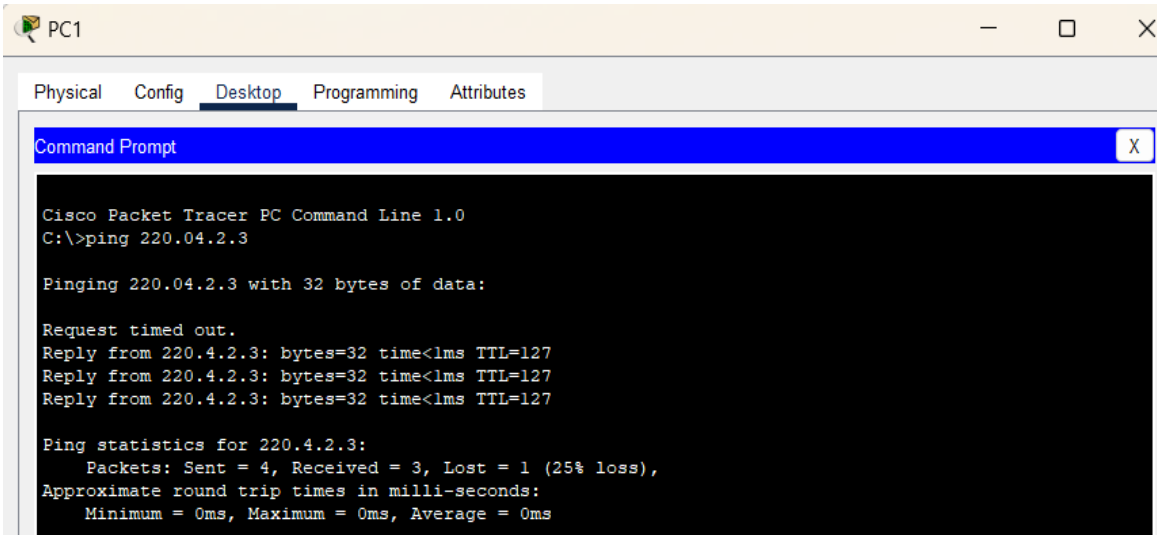
Roll no:AM.EN.U4ECE22004

Q2) Create 3 LAN networks connected via a single Router (CPT). Choose appropriate router, connection and configure it. Each LAN network is configured via Tree, Star and Ring topologies respectively.



Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	--	PC2	PC4	ICMP		0.000	N	0	(edit)	(delete)
	--	PC12	PC3	ICMP		0.000	N	1	(edit)	(delete)
	--	PC0	PC10	ICMP		0.000	N	2	(edit)	(delete)

1. From PC1 to PC10



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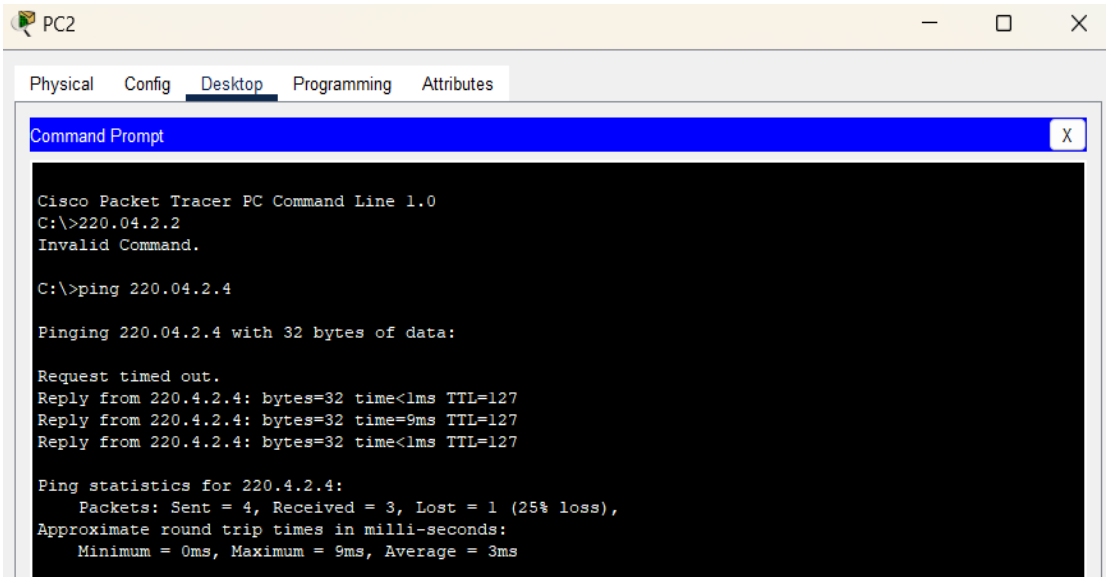
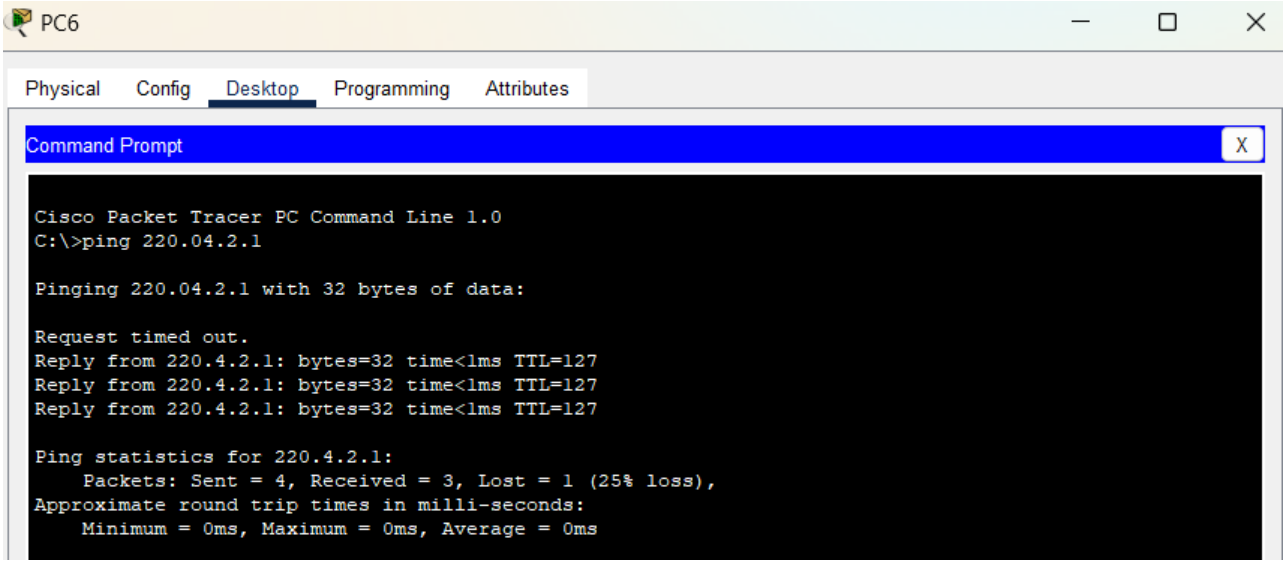
2. From PC2 To PC11



3. From PC6 to PC8



19ECE311-COMPUTER NETWORKS

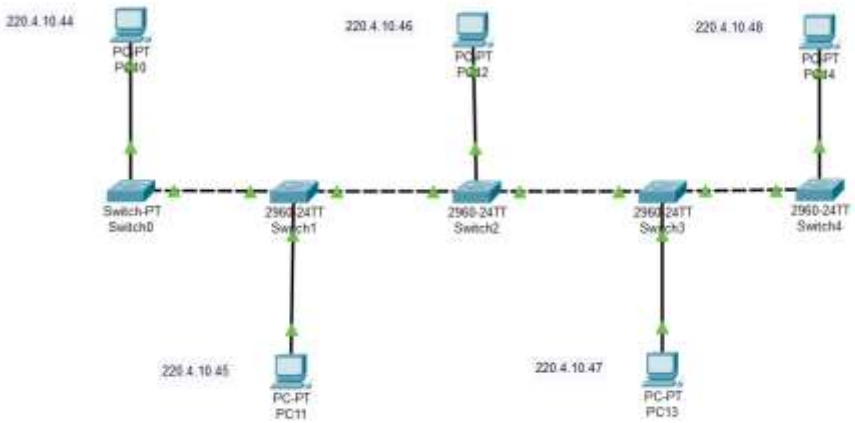
ASSIGNMENT

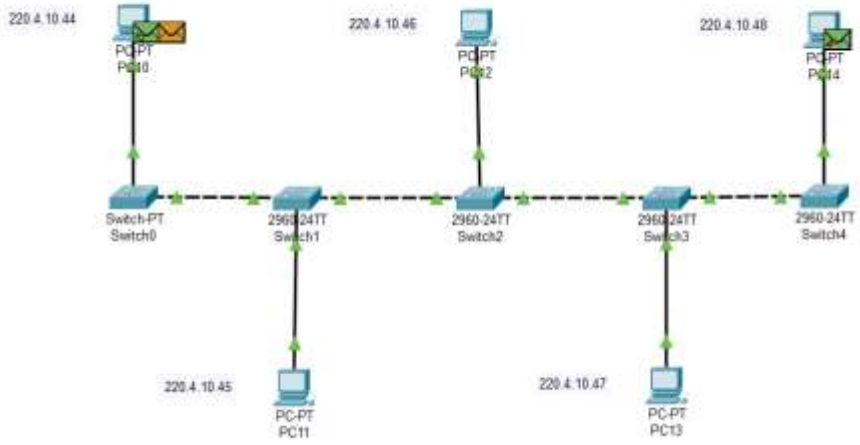
Name:ABHIJITH K

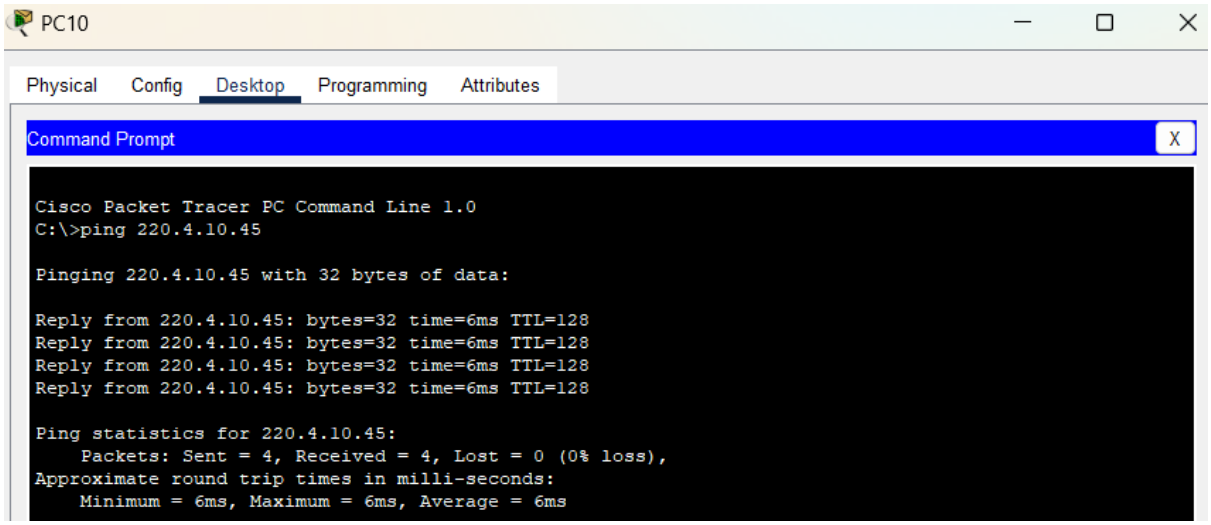
Roll no:AM.EN.U4ECE22004

1.BUS TOPOLOGY:

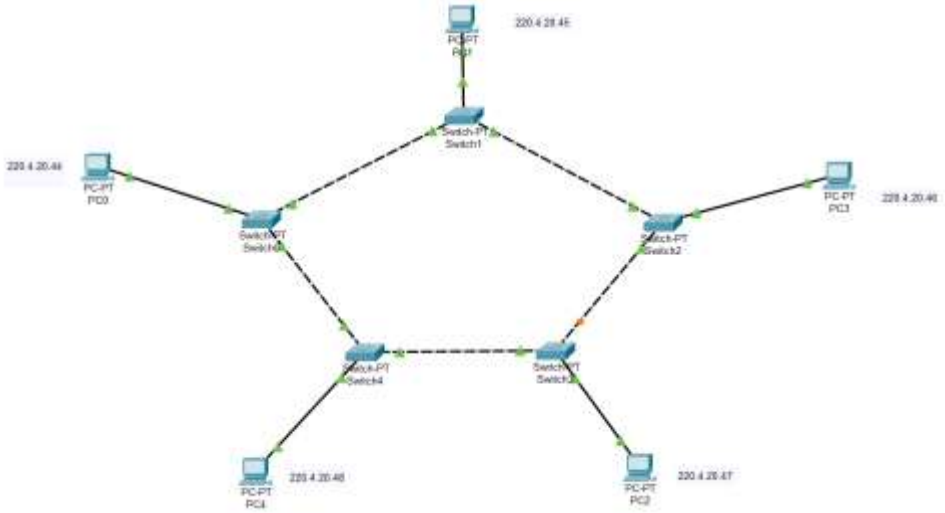
(PC10 to PC11)

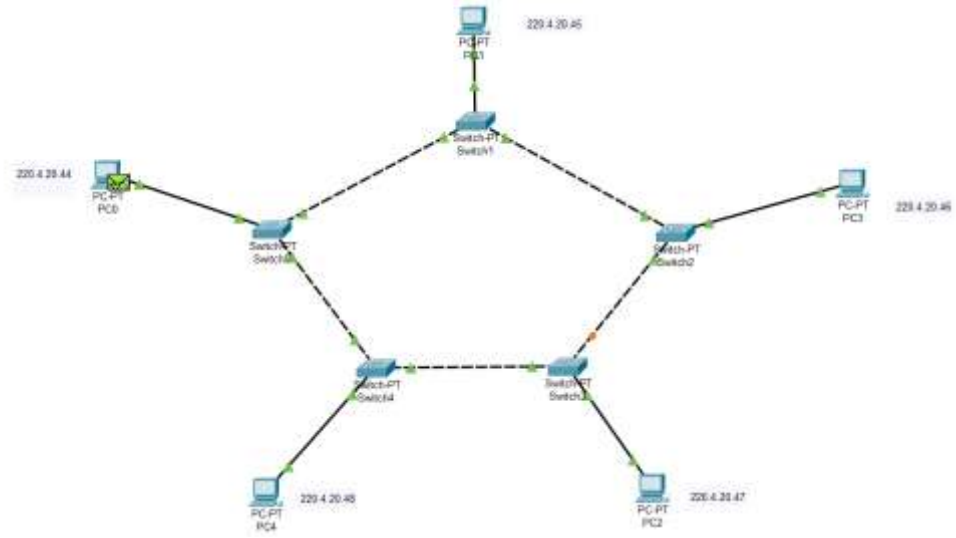


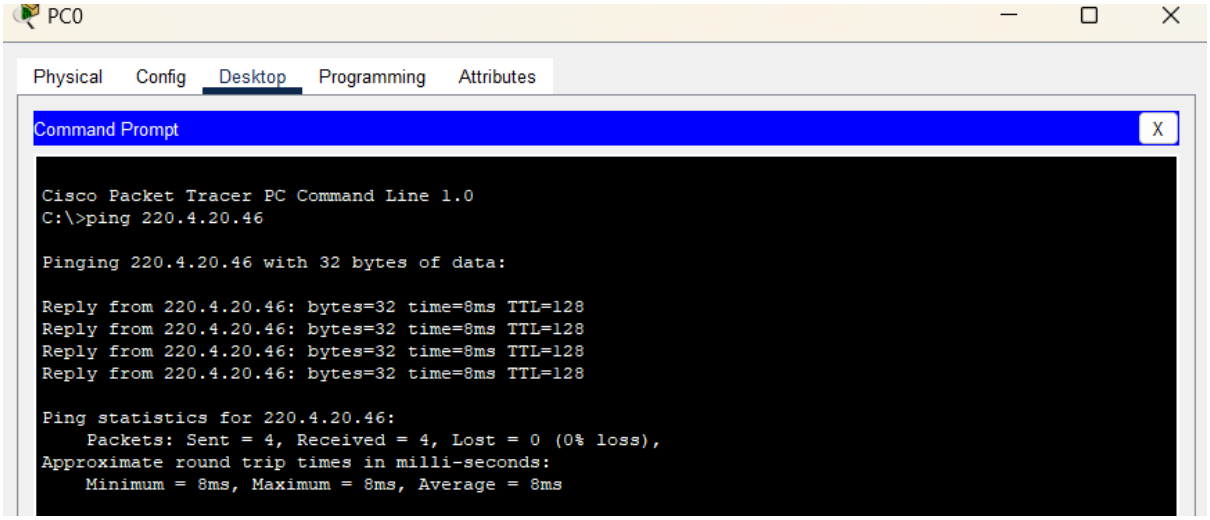




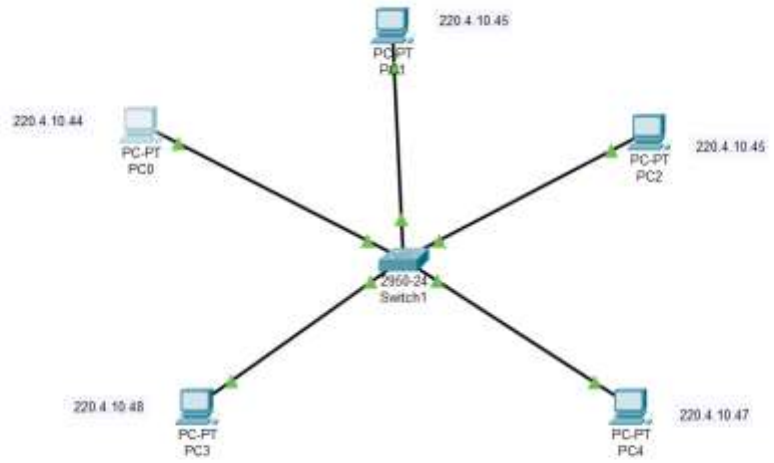
2.Ring topology:







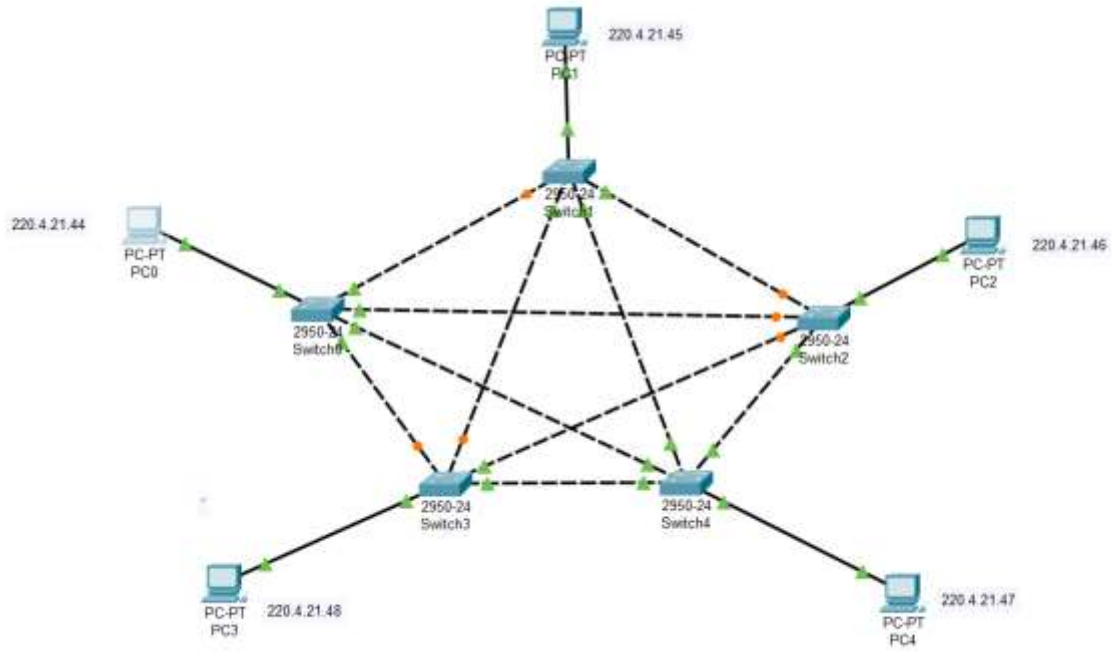
3.Star topology:

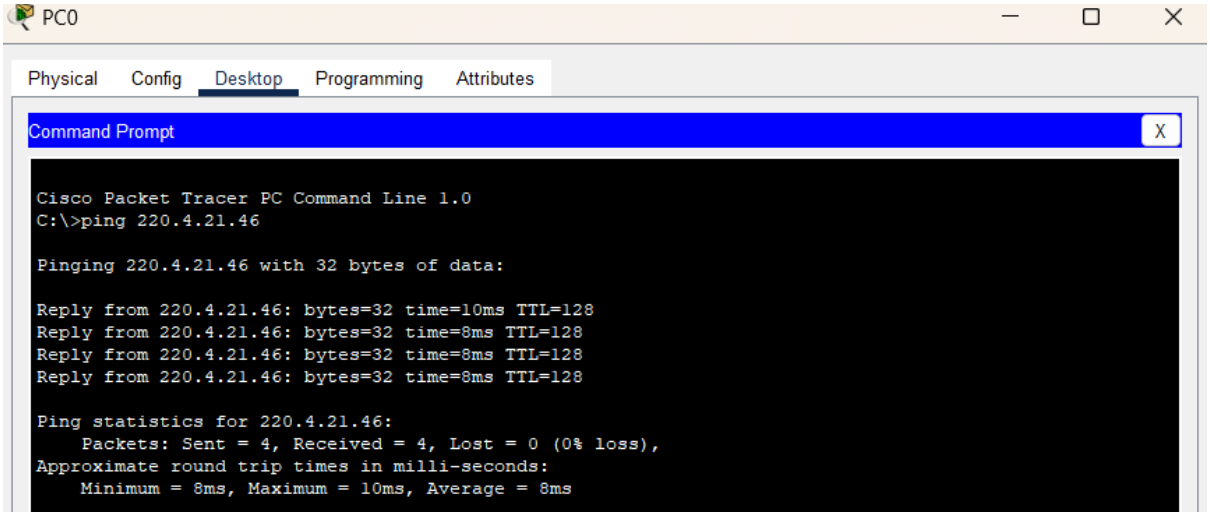


PC0 to PC2

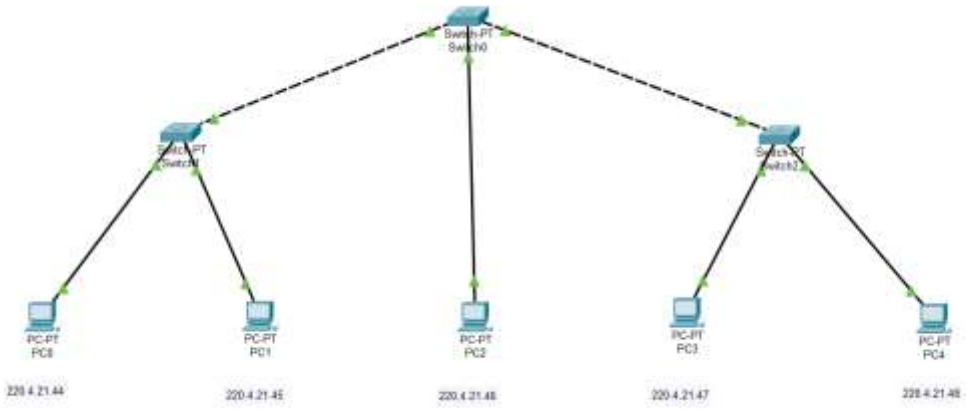
```
C:\>ping 220.4.10.45

Pinging 220.4.10.45 with 32 bytes of data:

Reply from 220.4.10.45: bytes=32 time=8ms TTL=128
Reply from 220.4.10.45: bytes=32 time=4ms TTL=128
Reply from 220.4.10.45: bytes=32 time=4ms TTL=128
Reply from 220.4.10.45: bytes=32 time=4ms TTL=128

Ping statistics for 220.4.10.45:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 4ms, Maximum = 8ms, Average = 5ms
```

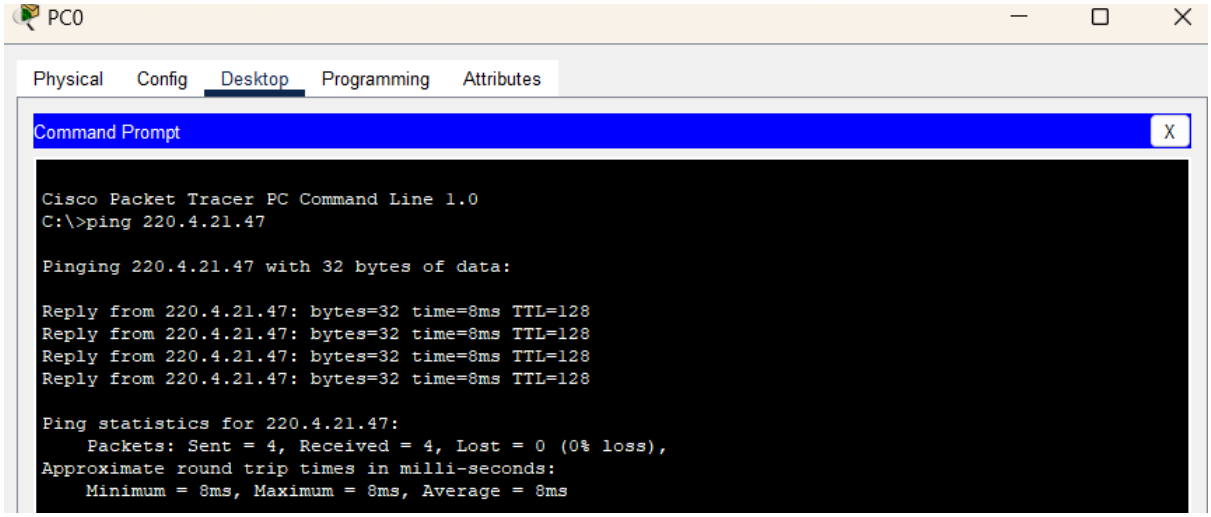
4.Mesh topology





5.Tree topology





RESULT:

1. **Ping Tests:**
    - **PC1 to PC10:**
        - Packets Sent: 4, Received: 3, Lost: 1 (25% loss).
        - Round Trip Times: Minimum = 0ms, Maximum = 0ms, Average = 0ms.
    - **PC2 to PC11:**
        - Packets Sent: 4, Received: 3, Lost: 1 (25% loss).
        - Round Trip Times: Minimum = 0ms, Maximum = 9ms, Average = 0ms.
    - **PC6 to PC8:**
        - Packets Sent: 4, Received: 3, Lost: 1 (25% loss).
        - Round Trip Times: Minimum = 0ms, Maximum = 0ms, Average = 0ms.
2. **Topologies Implemented:**
    - **Bus Topology:** Demonstrated connectivity between PC10 and PC11.
    - **Ring Topology:** Devices connected in a circular fashion.
    - **Star Topology:** Centralized connection with PC0 to PC2.
    - **Mesh Topology:** Fully interconnected devices.
    - **Tree Topology:** Hierarchical structure with branching connections.
3. **Configuration Observations:**
    - The router successfully connected three LANs, each configured with Tree, Star, and Ring topologies.
    - ICMP packets (ping) were used to test connectivity, showing partial success with occasional packet loss.

INFERENCE:

1. Network Performance:
    - The 25% packet loss in all ping tests suggests intermittent connectivity issues, possibly due to misconfiguration, high traffic, or faulty links.
    - Consistent low latency (0ms) indicates efficient routing within the LANs when packets were successfully transmitted.
2. Topology Suitability:
    - Star Topology: Performed reliably for direct connections (e.g., PC0 to PC2), benefiting from centralized management.
    - Ring Topology: May introduce delays if a node fails, but the test showed no significant latency.
    - Bus/Tree Topologies: Scalability issues might arise in larger networks, but functioned adequately in this small-scale setup.
    - Mesh Topology: Provided redundancy but required more cabling and configuration effort.
3. Router Configuration:
    - The router enabled inter-LAN communication, but the packet loss suggests potential issues in routing tables or interface settings.
    - ICMP replies confirmed basic connectivity, but further troubleshooting (e.g., checking ARP tables or firewall settings) is recommended to address packet loss.
4. Overall Setup:
    - The assignment successfully demonstrated multi-topology LAN integration via a router.
    - Areas for improvement include reducing packet loss and verifying IP addressing/subnetting across LANs.