

## Practical - 4

**Aim:** To implement access control list (ACL) in network of an organization containing different departments.

### **Scenario:**

There is an organization of the University having 3 different departments University, ICT and DCS. IPv4 addressing scheme is used for assigning the IP address to the device as shown in Table1. Each department has multiple employees, which have specific rights to communicate within the network. The details of the rights are as mentioned below:

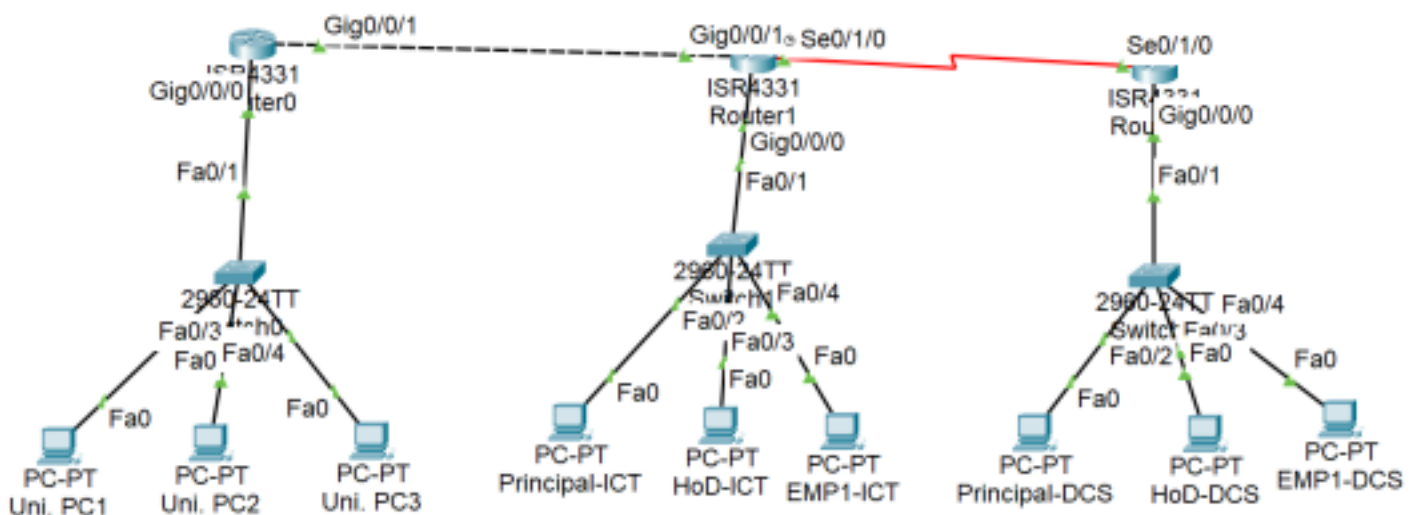
### **Access Rights:**

- University can contact all employees.
- Only Principal can contact University office.
- All Principals should contact each other
- All head of departments can contact each other

Configure Access Control List (ACL) at each router according to the specified access rights.

### **Procedure:**

- 1) Create network as given below



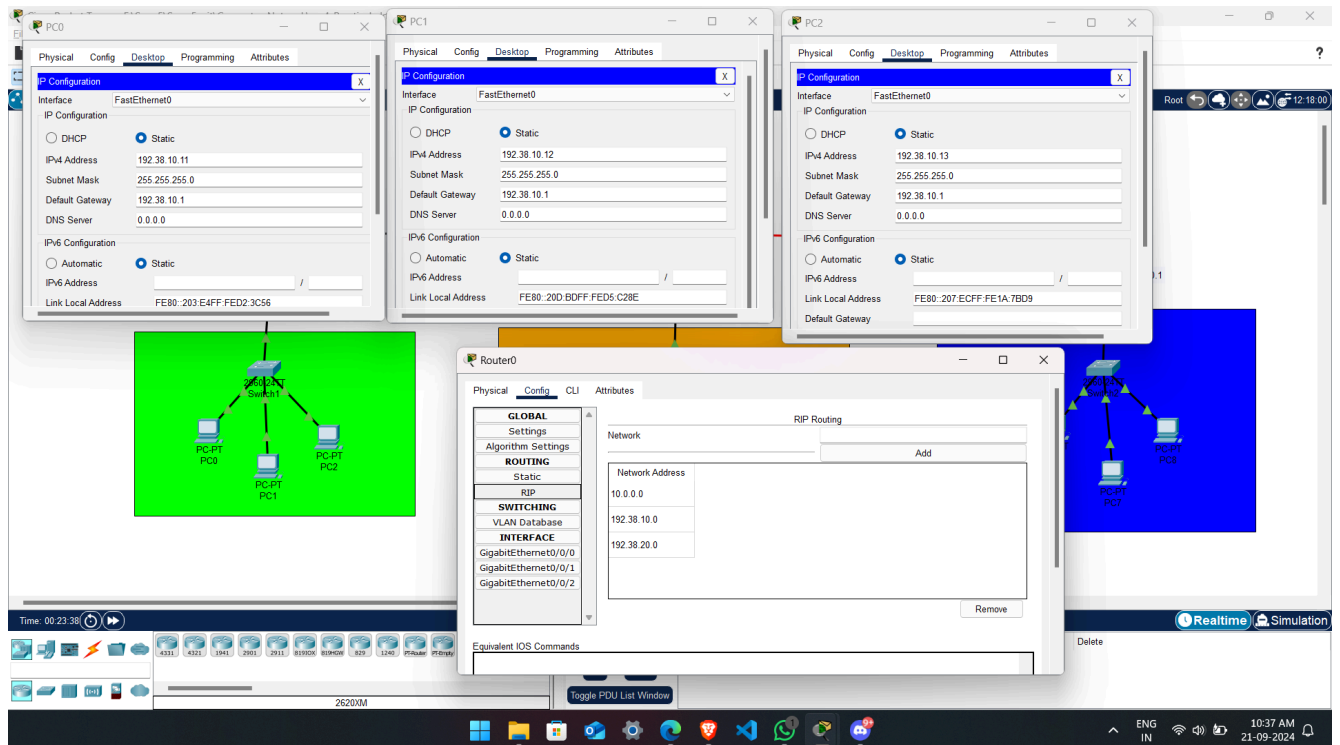
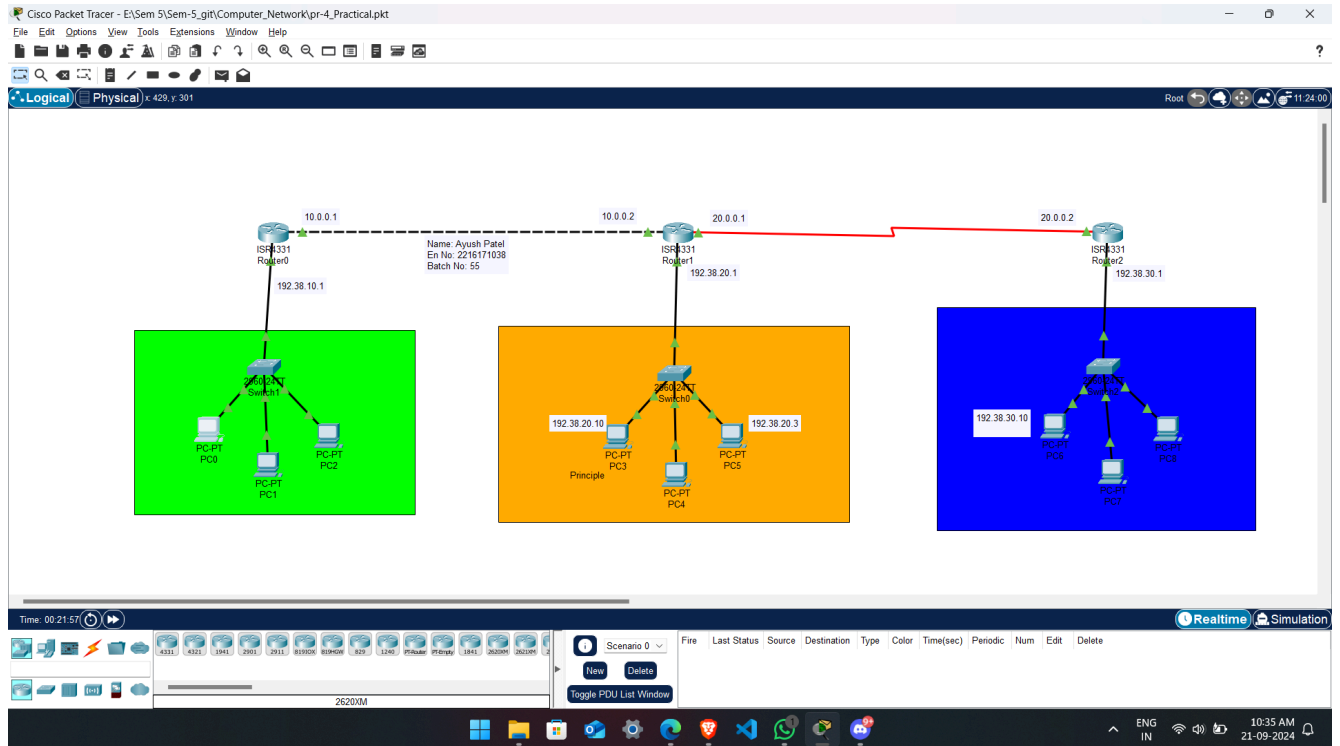
**Name: Ayush Patel Class B Batch 55 Enrolment: 22162171038**

| Department | Device        | IP Address   | Subnet Mask   | Default Gateway |
|------------|---------------|--------------|---------------|-----------------|
| University | Uni. PC1      | 192.XX.10.11 | 255.255.255.0 | 192.XX.10.1     |
|            | Uni. PC2      | 192.XX.10.12 | 255.255.255.0 | 192.XX.10.1     |
|            | Uni. PC3      | 192.XX.10.13 | 255.255.255.0 | 192.XX.10.1     |
| ICT        | Principal-ICT | 192.XX.20.11 | 255.255.255.0 | 192.XX.20.1     |
|            | HoD-ICT       | 192.XX.20.12 | 255.255.255.0 | 192.XX.20.1     |
|            | EMP1-ICT      | 192.XX.20.13 | 255.255.255.0 | 192.XX.20.1     |
| DCS        | Principal-DCS | 192.XX.30.11 | 255.255.255.0 | 192.XX.30.1     |
|            | HoD-DCS       | 192.XX.30.12 | 255.255.255.0 | 192.XX.30.1     |
|            | EMP2-DCS      | 192.XX.30.13 | 255.255.255.0 | 192.XX.30.1     |

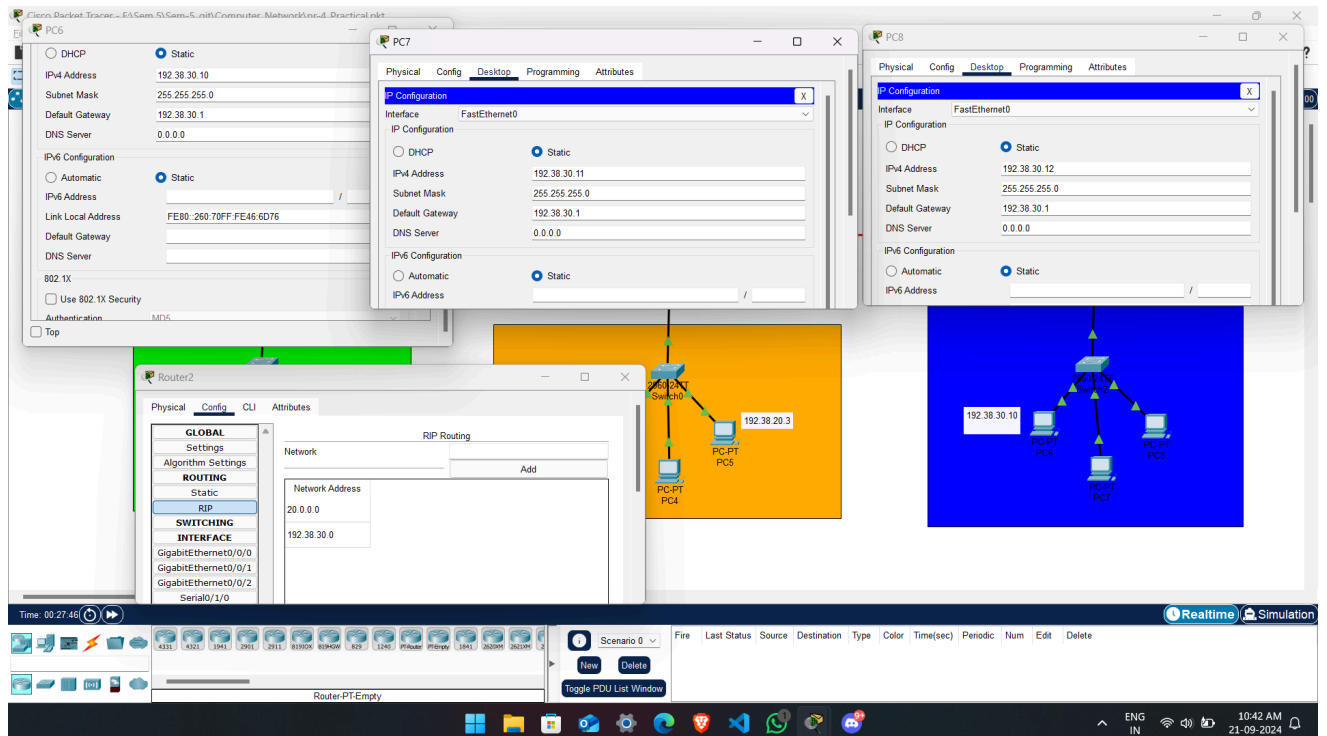
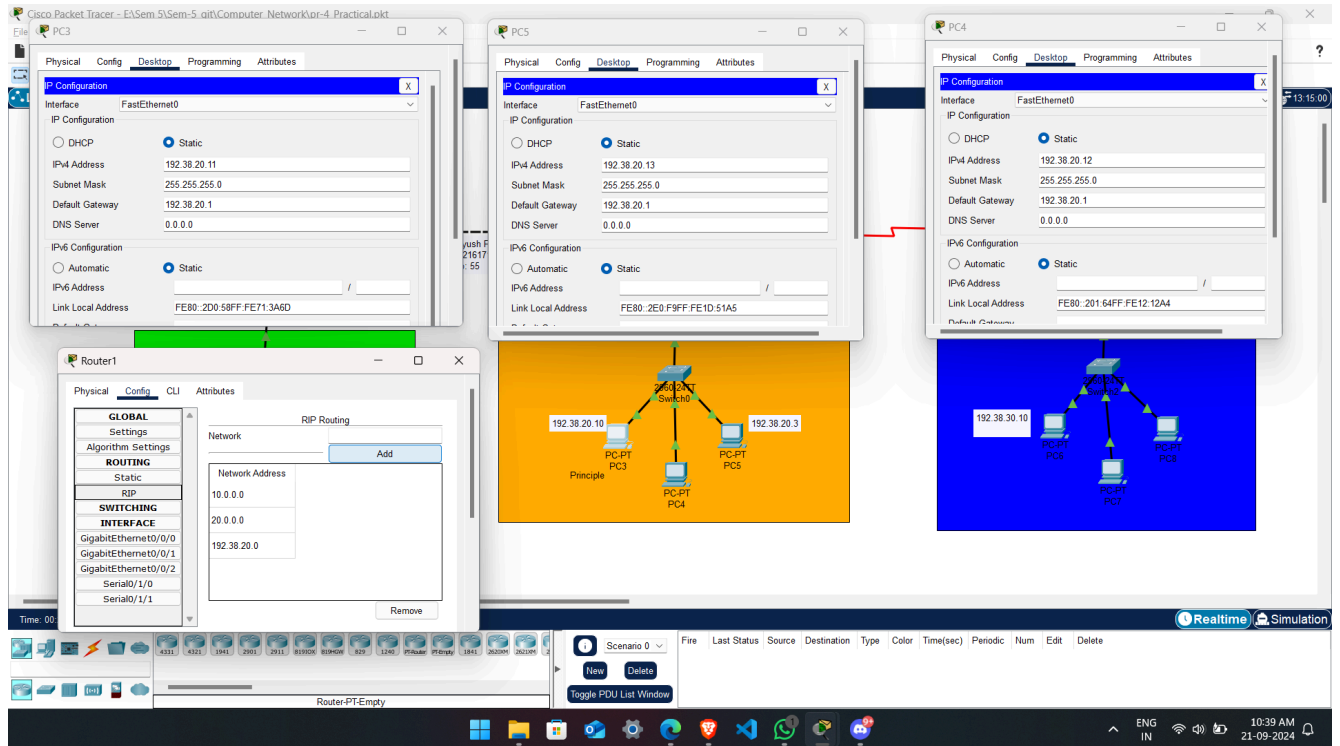
- 2) Configure IP address (All Devices, Routers)
- 3) Configure dynamic routing table (RIP in routers)
- 4) Configure ACL on Router0
- 5) Configure ACL on Router1
- 6) Configure ACL on Router2

**Configuration:**

Name: Ayush Patel Class B Batch 55 Enrolment: 22162171038



Name: Ayush Patel Class B Batch 55 Enrolment: 22162171038



# Name: Ayush Patel Class B Batch 55 Enrolment: 22162171038

The screenshot shows the Cisco Packet Tracer interface with three routers: Router0, Router1, and Router2. The network topology is a simple line connection: Router0 --- Router1 --- Router2. The configuration windows for each router are open, showing the configuration of GigabitEthernet0/0/0 on Router0, GigabitEthernet0/0/0 on Router1, and GigabitEthernet0/0/1 on Router2. The configuration includes IP addresses, subnet masks, and other interface settings.

**Router0 Configuration:**

- Interface: GigabitEthernet0/0/0
- IP Address: 10.0.0.1
- Subnet Mask: 255.0.0.0
- MAC Address: 0001.43EB.1301
- Port Status: On
- Bandwidth: 1000 Mbps
- Duplex: Full Duplex
- Algorithm Settings: Static
- ROUTING: Static
- SWITCHING: VLAN Database
- INTERFACE: GigabitEthernet0/0/0

**Router1 Configuration:**

- Interface: GigabitEthernet0/0/0
- IP Address: 10.0.0.2
- Subnet Mask: 255.0.0.0
- MAC Address: 0002.17C6.8D01
- Port Status: On
- Bandwidth: 1000 Mbps
- Duplex: Full Duplex
- Algorithm Settings: Static
- ROUTING: Static
- SWITCHING: VLAN Database
- INTERFACE: GigabitEthernet0/0/0

**Router2 Configuration:**

- Interface: GigabitEthernet0/0/1
- IP Address: 20.0.0.1
- Subnet Mask: 255.255.255.0
- MAC Address: 00E0.F74C.E702
- Port Status: On
- Bandwidth: 1000 Mbps
- Duplex: Full Duplex
- Algorithm Settings: Static
- ROUTING: Static
- SWITCHING: VLAN Database
- INTERFACE: GigabitEthernet0/0/1

The screenshot shows the Cisco Packet Tracer interface with three routers: Router0, Router1, and Router2. The network topology is a simple line connection: Router0 --- Router1 --- Router2. The configuration windows for each router are open, showing the configuration of GigabitEthernet0/0/1 on Router0, GigabitEthernet0/0/1 on Router1, and Serial0/1/0 on Router2. The configuration includes IP addresses, subnet masks, and other interface settings.

**Router0 Configuration:**

- Interface: GigabitEthernet0/0/1
- IP Address: 192.38.10.1
- Subnet Mask: 255.255.255.0
- MAC Address: 0001.43EB.1302
- Port Status: On
- Bandwidth: 1000 Mbps
- Duplex: Full Duplex
- Algorithm Settings: Static
- ROUTING: Static
- SWITCHING: VLAN Database
- INTERFACE: GigabitEthernet0/0/1

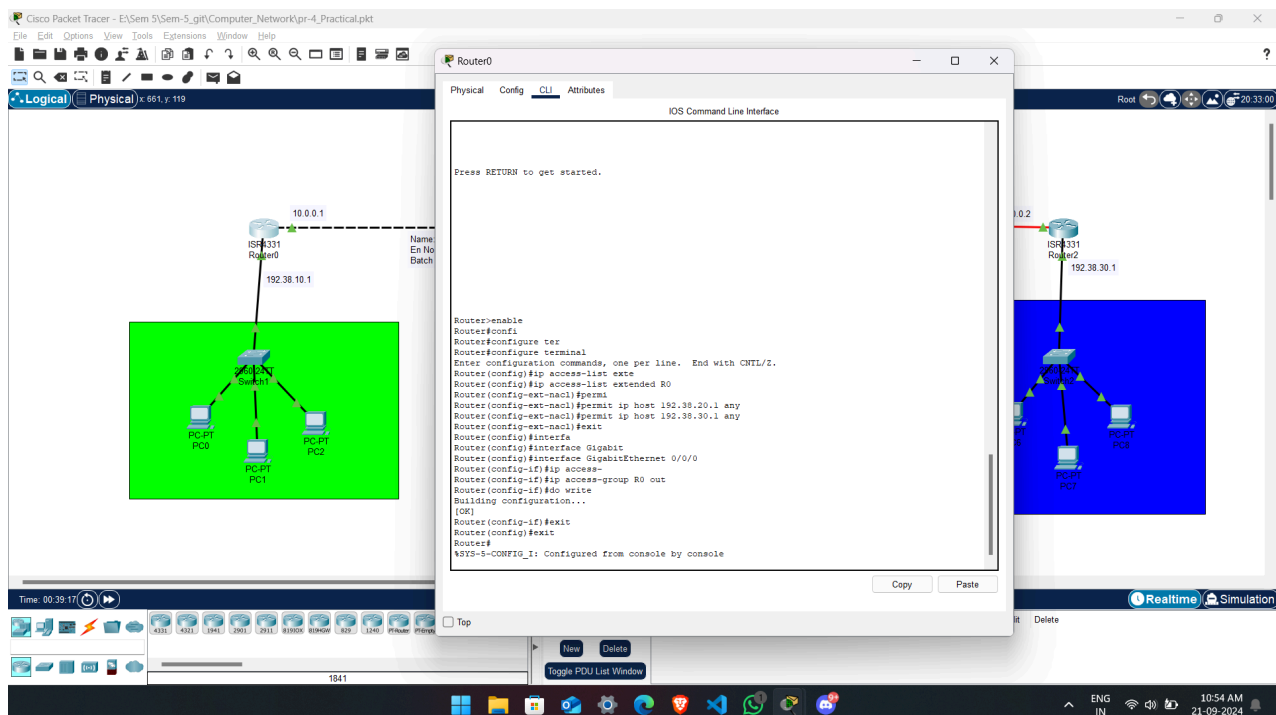
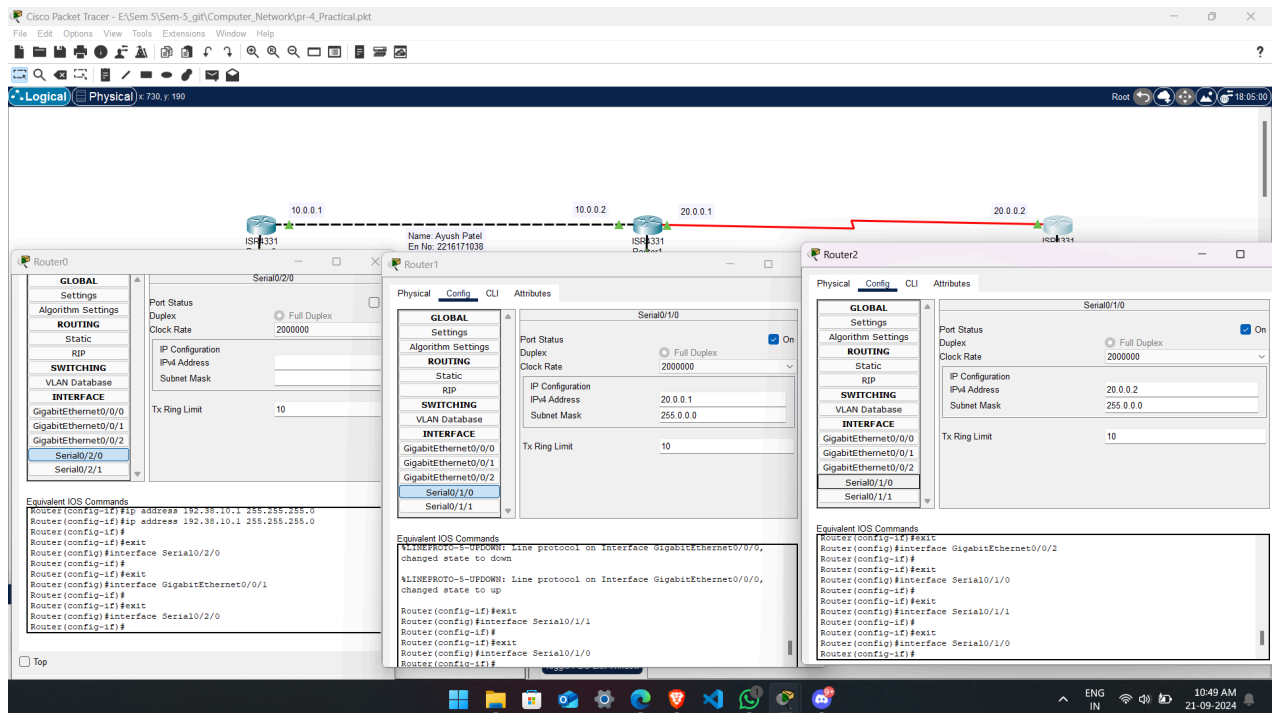
**Router1 Configuration:**

- Interface: GigabitEthernet0/0/1
- IP Address: 192.38.20.1
- Subnet Mask: 255.255.255.0
- MAC Address: 0002.17C6.8D02
- Port Status: On
- Bandwidth: 1000 Mbps
- Duplex: Full Duplex
- Algorithm Settings: Static
- ROUTING: Static
- SWITCHING: VLAN Database
- INTERFACE: GigabitEthernet0/0/1

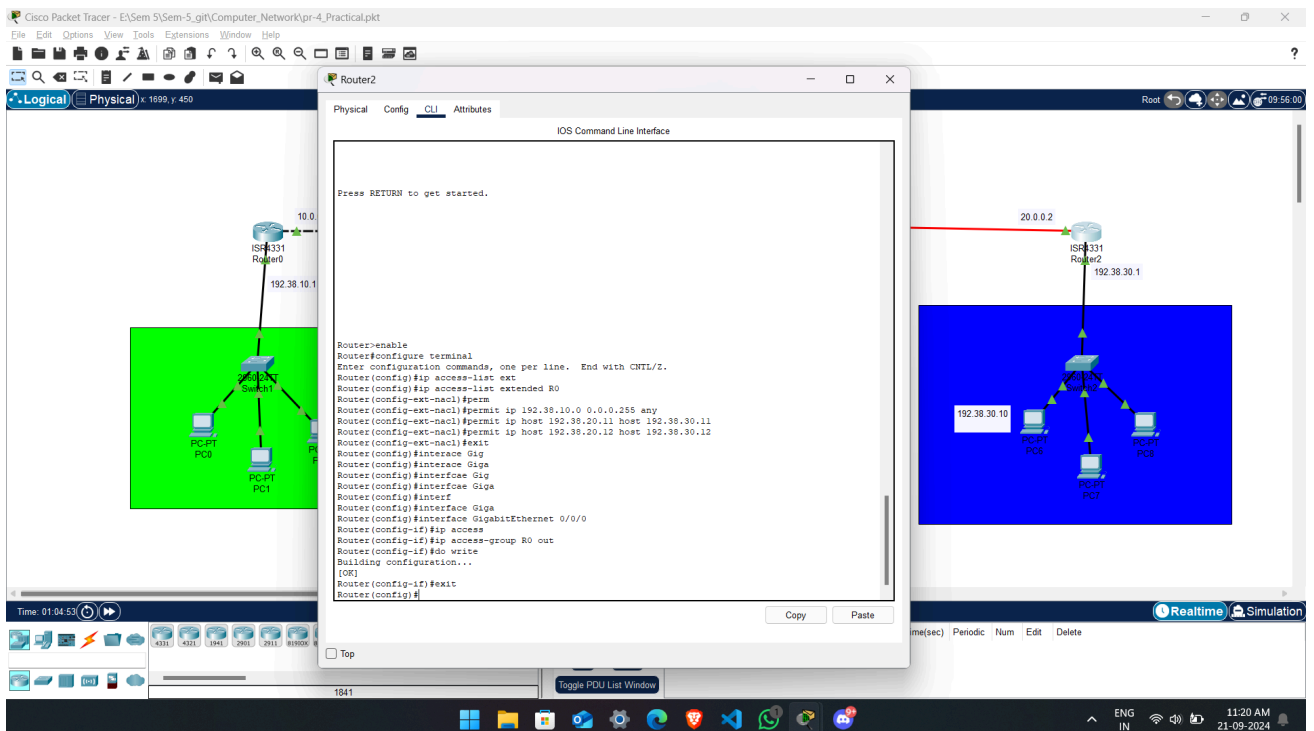
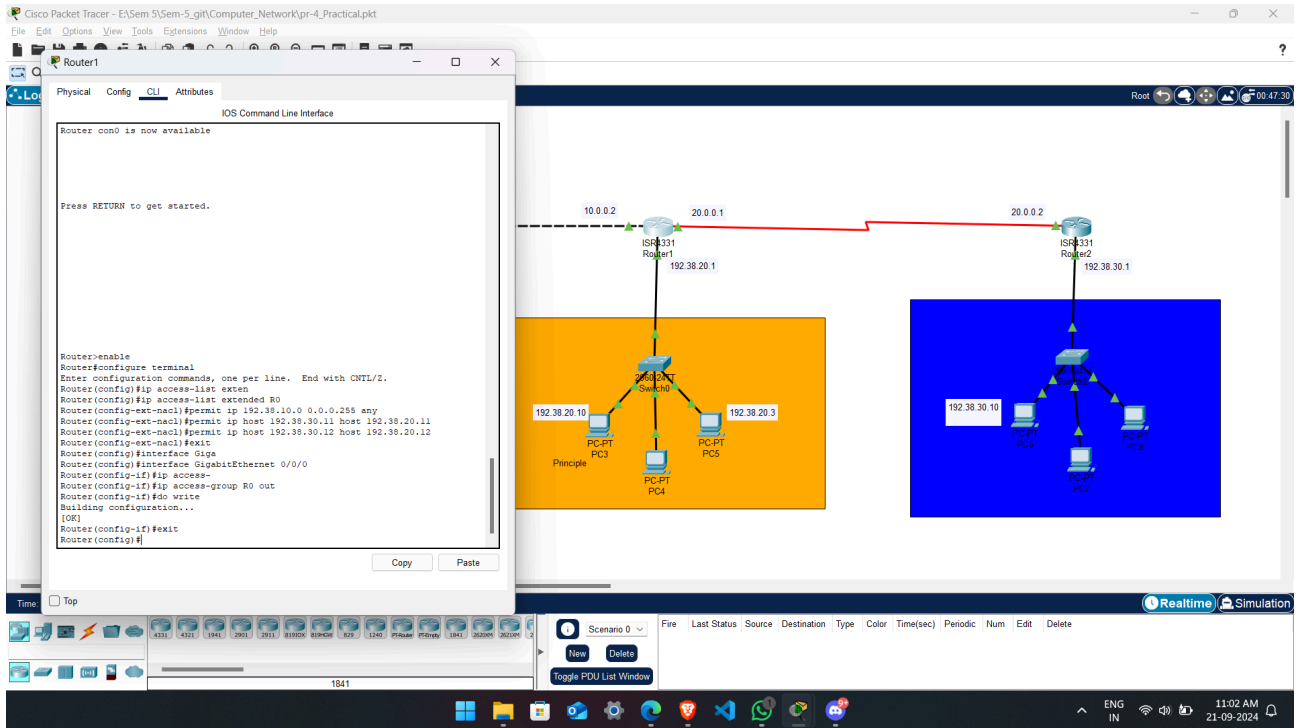
**Router2 Configuration:**

- Interface: Serial0/1/0
- IP Address: 20.0.0.2
- Subnet Mask: 255.0.0.0
- Port Status: On
- Bandwidth: 2000000
- Duplex: Full Duplex
- Algorithm Settings: Static
- ROUTING: Static
- SWITCHING: VLAN Database
- INTERFACE: Serial0/1/0

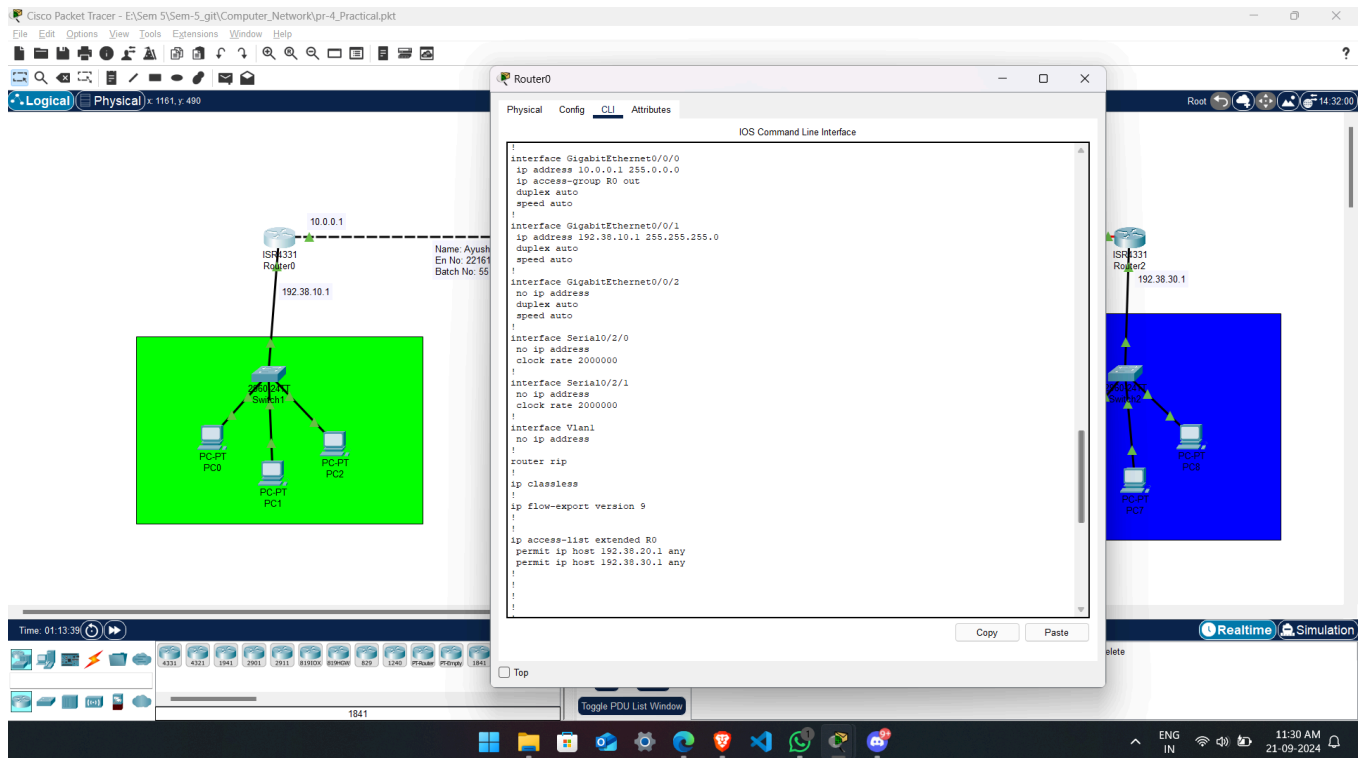
Name: Ayush Patel Class B Batch 55 Enrolment: 22162171038



**Name: Ayush Patel Class B Batch 55 Enrolment: 22162171038**

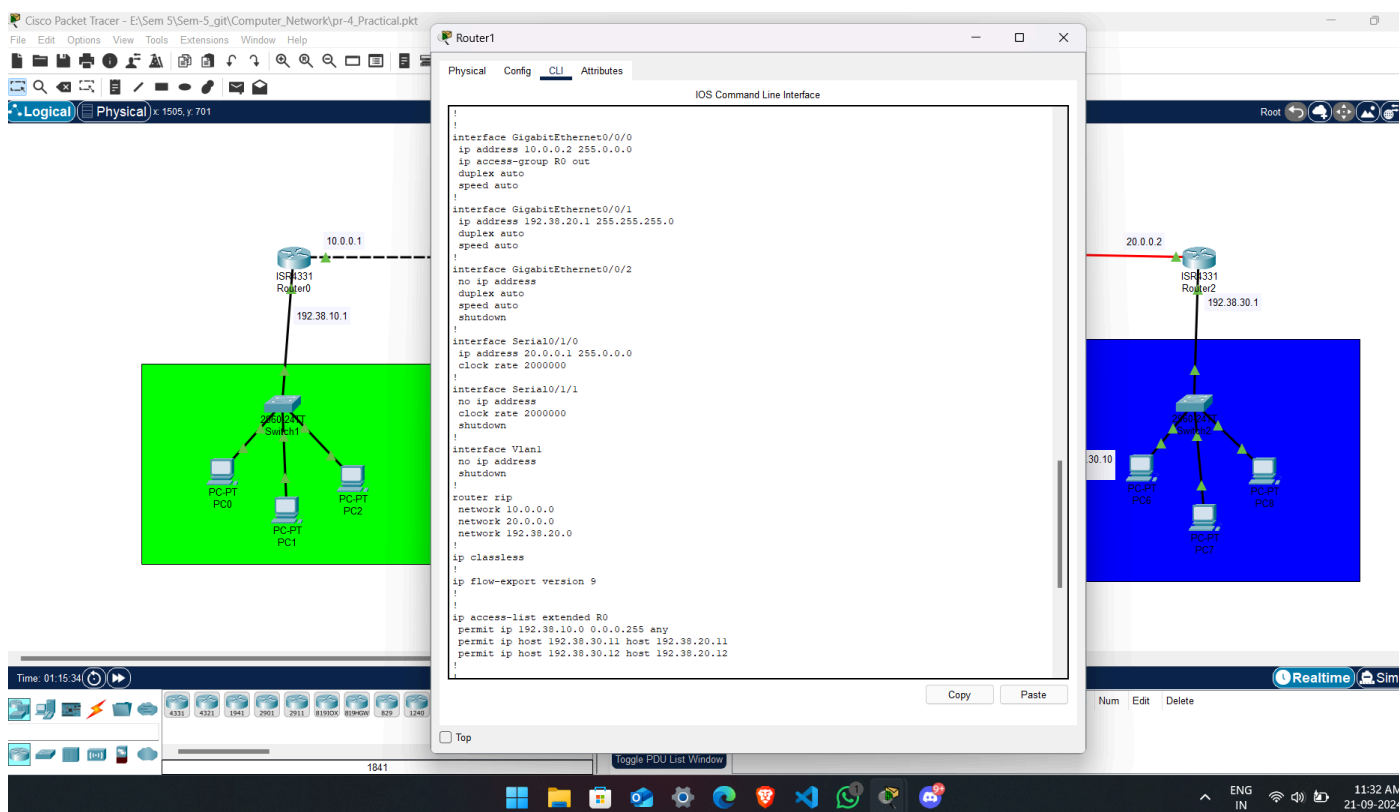
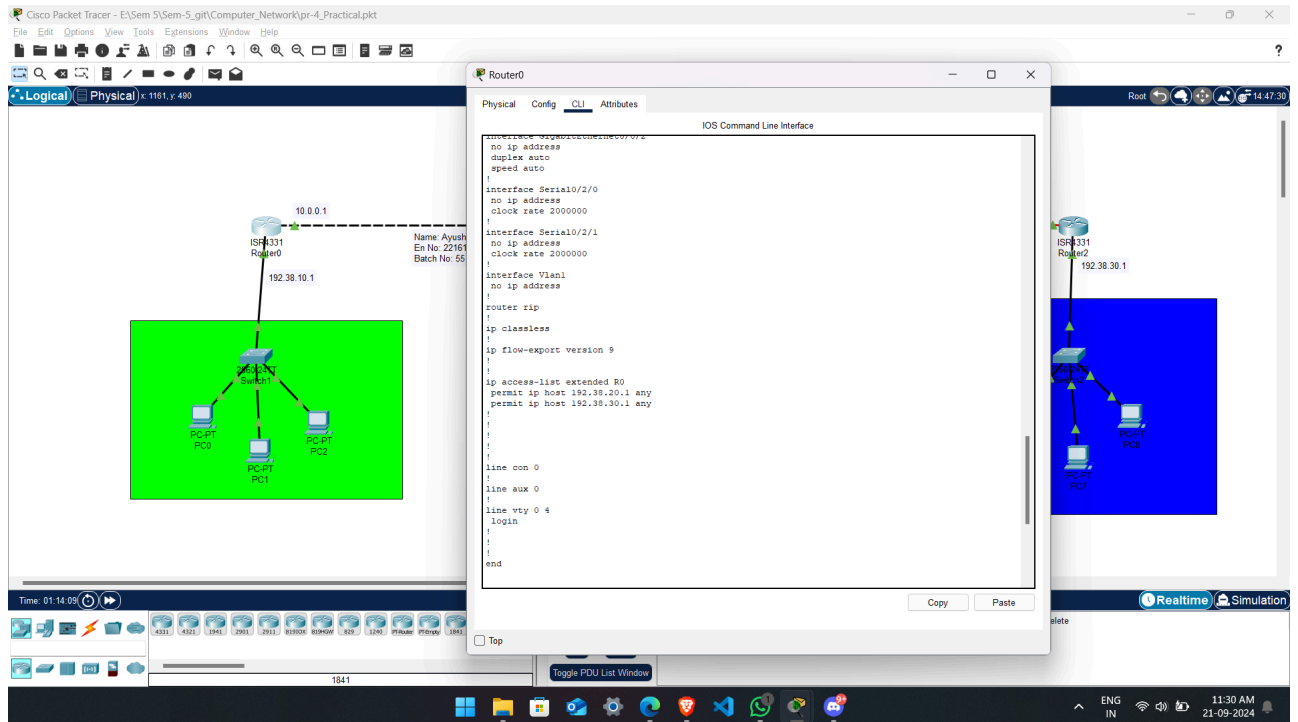


## Output:

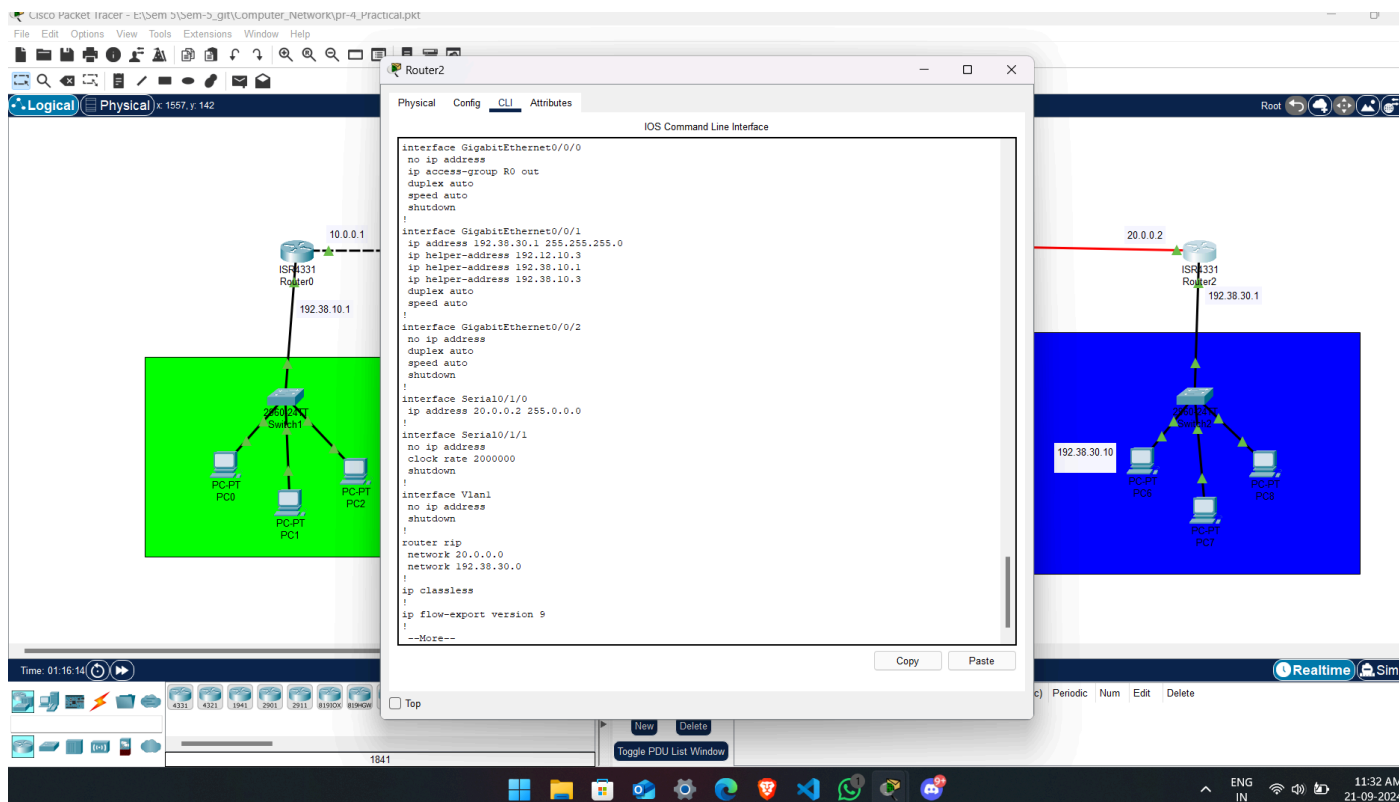




# Name: Ayush Patel Class B Batch 55 Enrolment: 22162171038



```
!  
ip access-list extended R0  
  permit ip 192.38.10.0 0.0.0.255 any  
  permit ip host 192.38.30.11 host 192.38.20.11  
  permit ip host 192.38.30.12 host 192.38.20.12  
!  
!  
!  
!  
!  
line con 0  
!  
line aux 0  
!  
line vty 0 4  
  login  
!  
!  
!  
end
```



```
IOS Command Line Interface

shutdown
!
interface Vlan1
  no ip address
  shutdown
!
router rip
  network 20.0.0.0
  network 192.38.30.0
!
ip classless
!
ip flow-export version 9
!
!
ip access-list extended R0
  permit ip 192.38.10.0 0.0.0.255 any
  permit ip host 192.38.20.11 host 192.38.30.11
  permit ip host 192.38.20.12 host 192.38.30.12
!
!
!
!
!
line con 0
!
line aux 0
!
line vty 0 4
  login
!
!
!
end
```

### **Conclusion:**

By utilizing access control lists in router configuration, it is possible to create rules (i.e. access rights) for communication between hosts and networks.

### **Note:**

Make sure last two digits of your enrollment numbers appears in network IP address that must be visible in snapshot of the cisco packet tracer. i.e. 192.XX.10.1 (XX indicates last two digits of your enrollment no.)