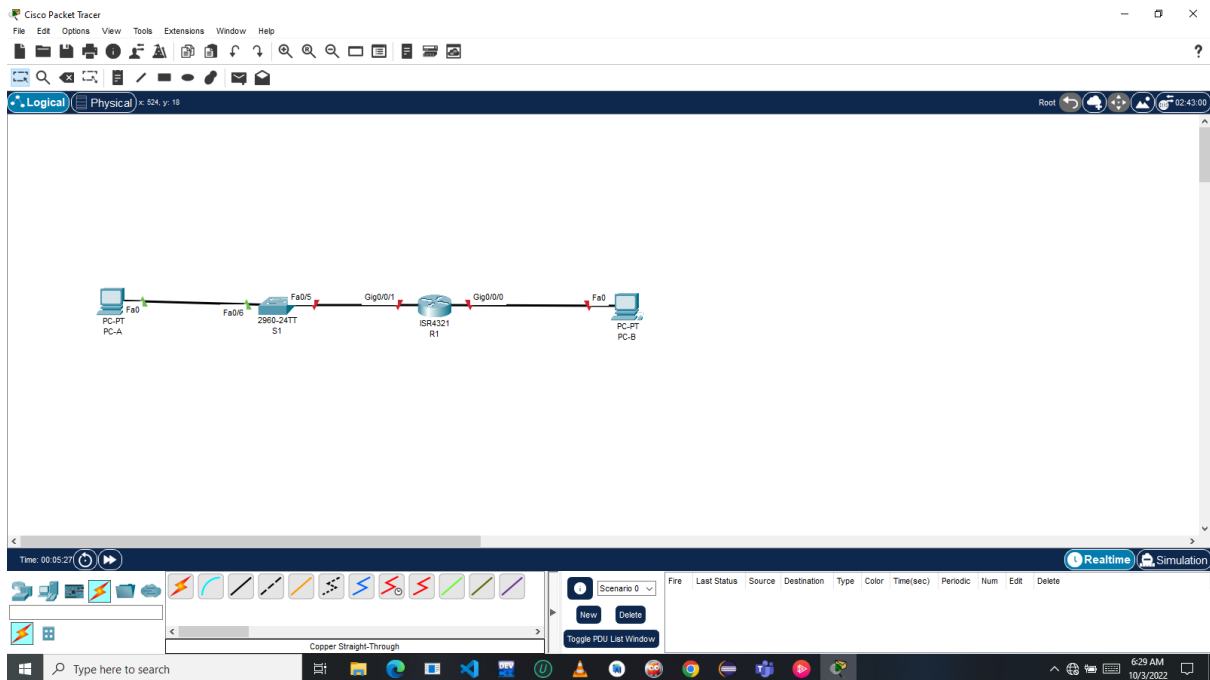
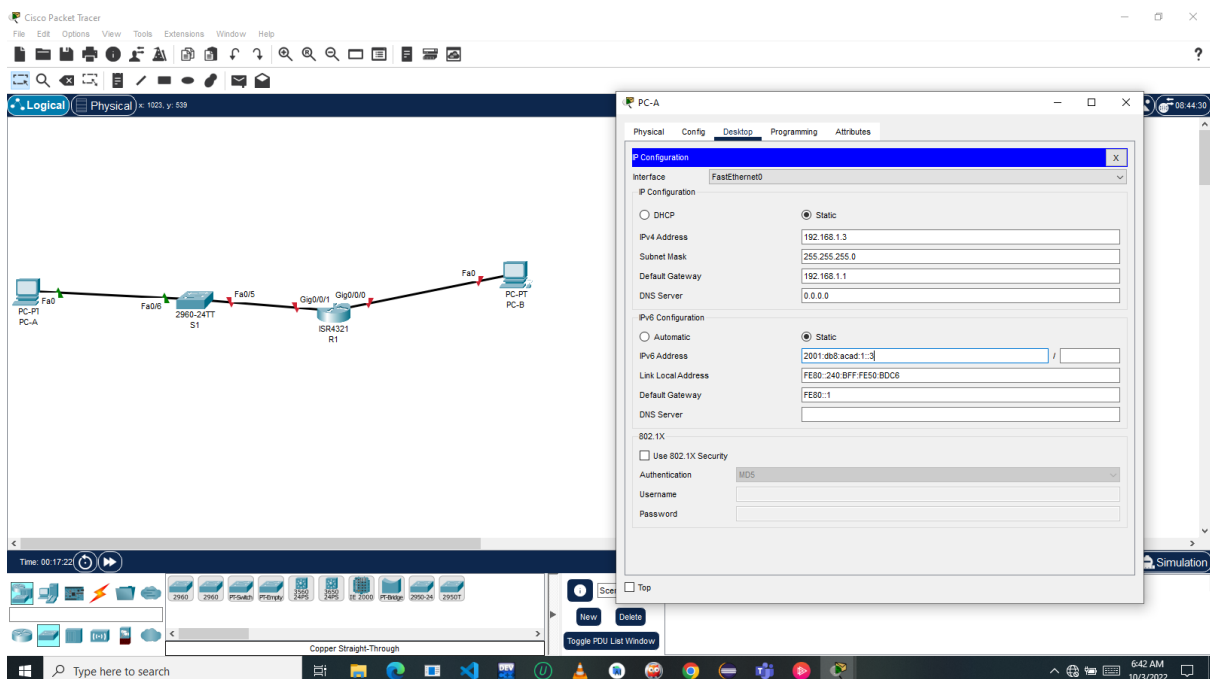


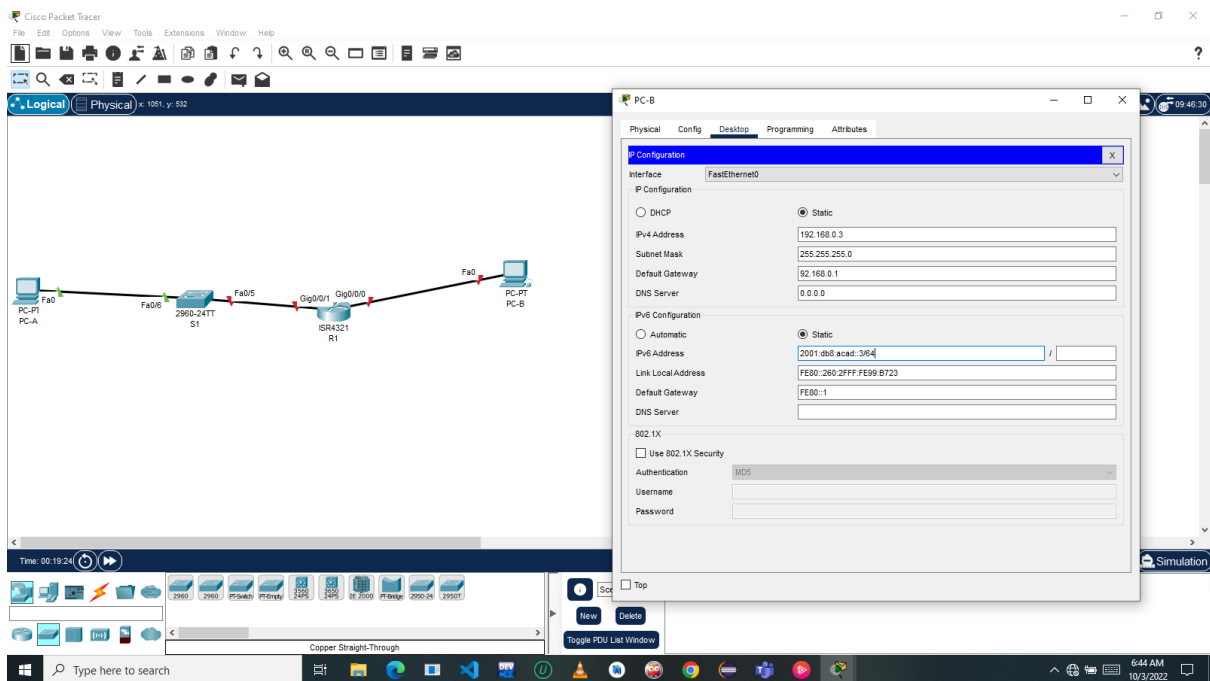
## Lab - Build a Switch and Router Network

## Objectives Part 1: Set Up the Topology and Initialize Devices

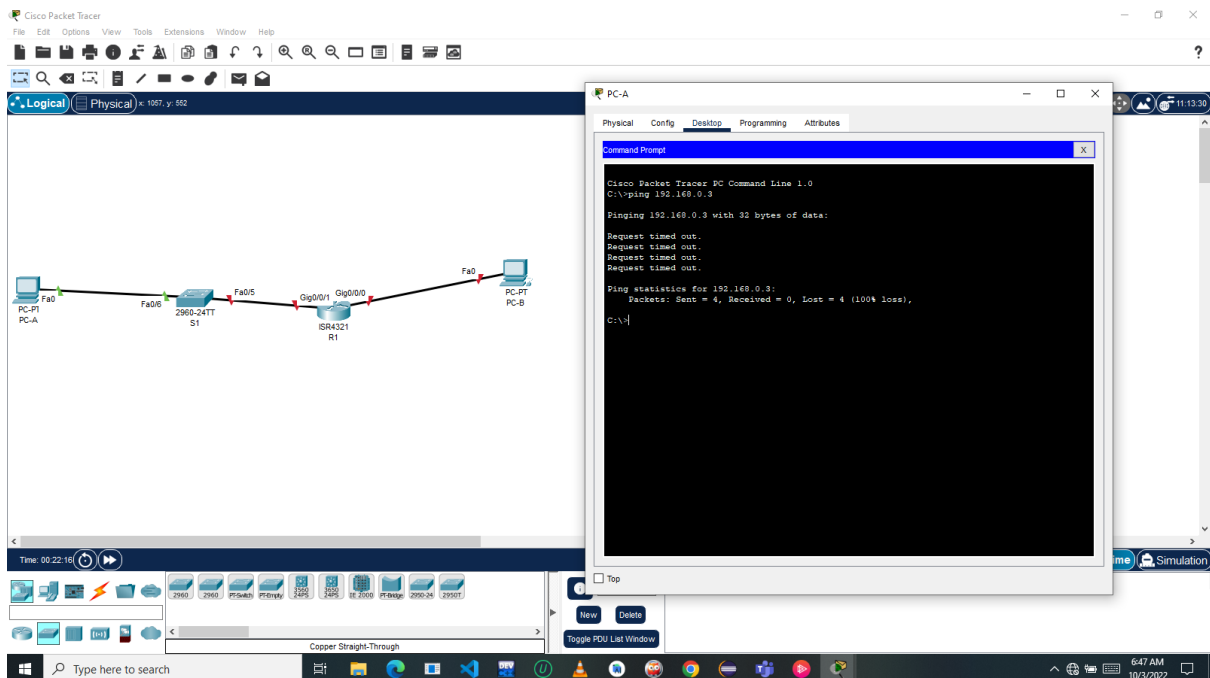


## Part 2: Configure Devices and Verify Connectivity





Ping PC-B from a command prompt window on PC-A



The router interfaces (default gateways) have not been configured yet so Layer 3 traffic is not being routed between subnets therefore the pings are not successful.

## Step 2: Configure the router.

The screenshot displays the Cisco Packet Tracer interface with two main windows. The left window, titled 'R1', shows the 'CLI' tab with the following configuration commands:

```
Router>enable
Router>config terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname R1
R1(config)#no ip domain lookup
R1(config)#enable secret class
R1(config)#line console 0
R1(config-line)#password cisco
R1(config-line)#login
R1(config-line)#line vty 0 4
R1(config-line)#password cisco
R1(config-line)#login
R1(config-line)#service password-encryption
R1(config)#banner motd # Authorized Users Only! #
R1(config)# interface g0/0/0
R1(config-if)#ip address 192.168.0.1 255.255.255.0
R1(config-if)# ipv6 address 2001:db8:acad::1/2
R1#
%SYS-6-CONFIG_I: Configured from console by console
R1#
R1#config terminal
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)# interface g0/0/0
R1(config-if)#ip address 192.168.0.1 255.255.255.0
R1(config-if)#ipv6 address 2001:db8:acad::1/64
R1(config-if)#ipv6 address fe80::1 link-local
R1(config-if)#no shutdown
R1#
%LINK-5-CHANGED: Interface GigabitEthernet0/0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0/0, changed state to up
R1(config)# interface g0/0/1
R1(config-if)# description Connected to F0/5 on S1
R1(config-if)#exit
R1(config)# interface g0/0/0
R1(config-if)# description Connected to Host PC-B
R1(config-if)#exit
R1(config)#ipv6 unicast-routing
R1(config)#exit
R1#
%SYS-6-CONFIG_I: Configured from console by console
R1#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
```

The right window shows the network topology in the 'Physical' tab. It includes a switch (S1) connected to a router (R1) via Fa0/6 and Fa0/5. The router is also connected to PC-P1 and PC-B via Fa0/0/1 and Fa0/0/0 respectively. The interface Fa0/0/0 is highlighted in green, indicating it is up.

## Step 3: Configure the switch

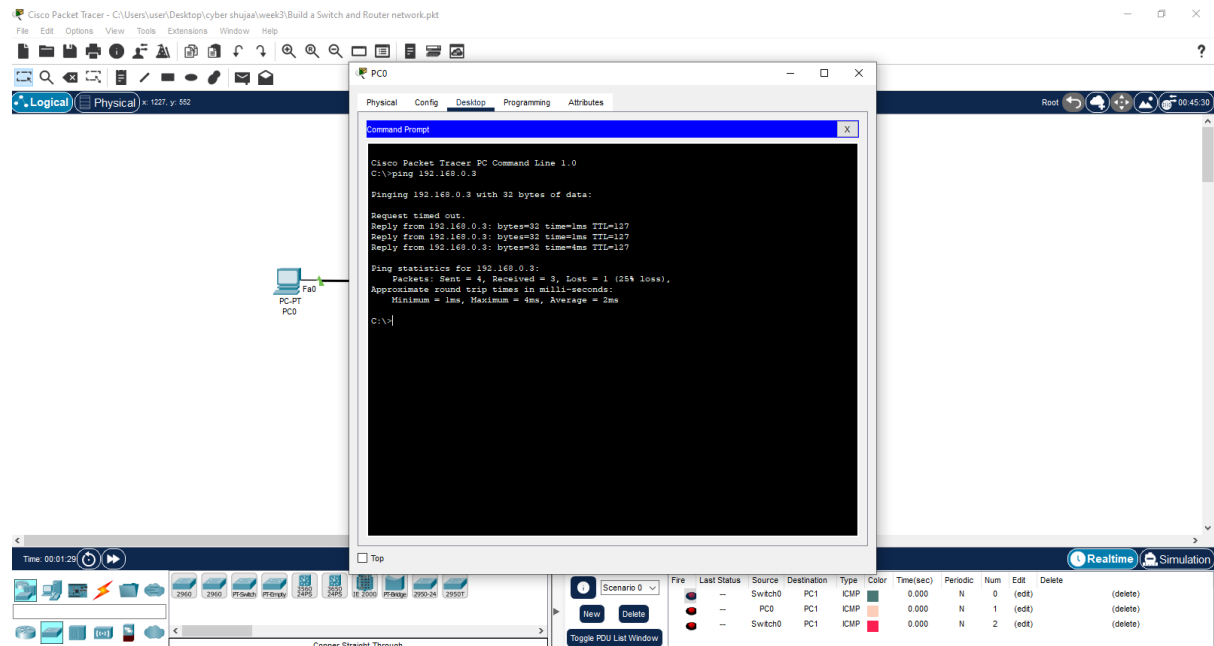
The screenshot displays the Cisco Packet Tracer interface with two main windows. The left window, titled 'S1', shows the 'CLI' tab with the following configuration commands:

```
Switch com0 is now available
|
Press RETURN to get started.

Switch>enable
Switch>config terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname S1
S1(config)#no ip domain-lookup
S1(config)#interface vlan 1
S1(config-if)# ip address 192.168.1.2 255.255.255.0
S1(config-if)#no shutdown
S1#
%LINK-5-CHANGED: Interface Vlan1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan1, changed state to up
S1(config-if)#exit
S1(config)#ip default-gateway 192.168.1.1
S1(config)#exit
S1#
%SYS-6-CONFIG_I: Configured from console by console
S1#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
(OK)
S1#
```

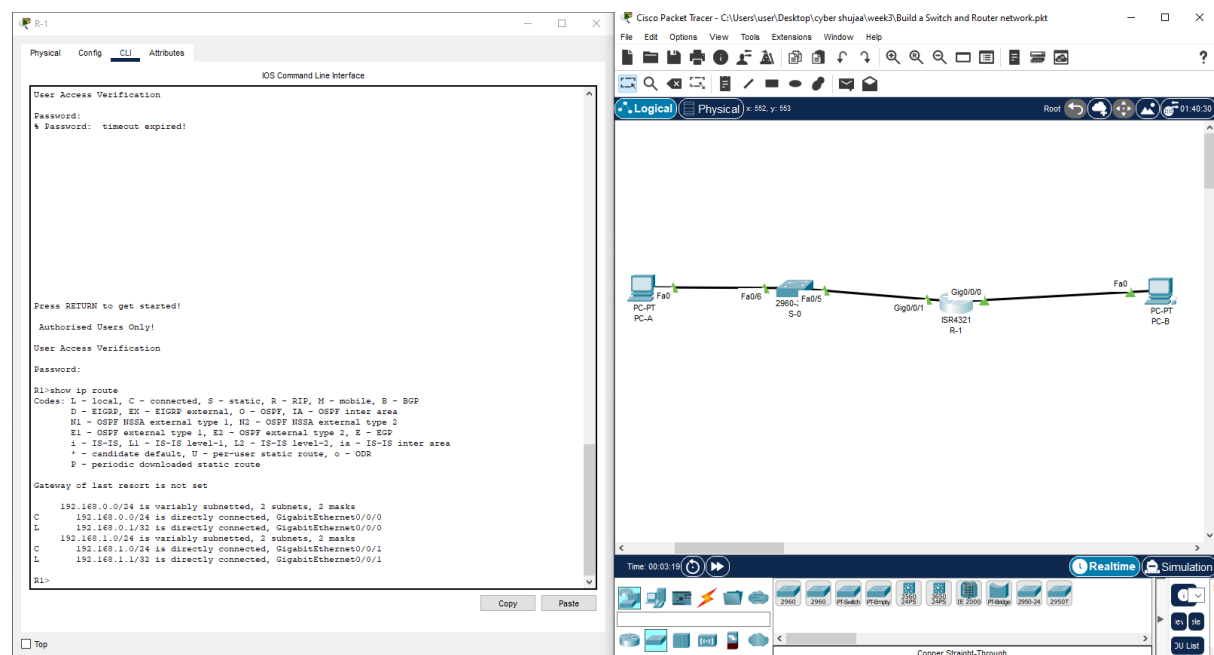
The right window shows the network topology in the 'Physical' tab. It includes a switch (S1) connected to a router (R1) via Fa0/6 and Fa0/5. The switch is also connected to PC-P1 and PC-B via Fa0/0/1 and Fa0/0/0 respectively. The interface Fa0/0/0 is highlighted in green, indicating it is up.

Verify connectivity end-to-end connectivity.



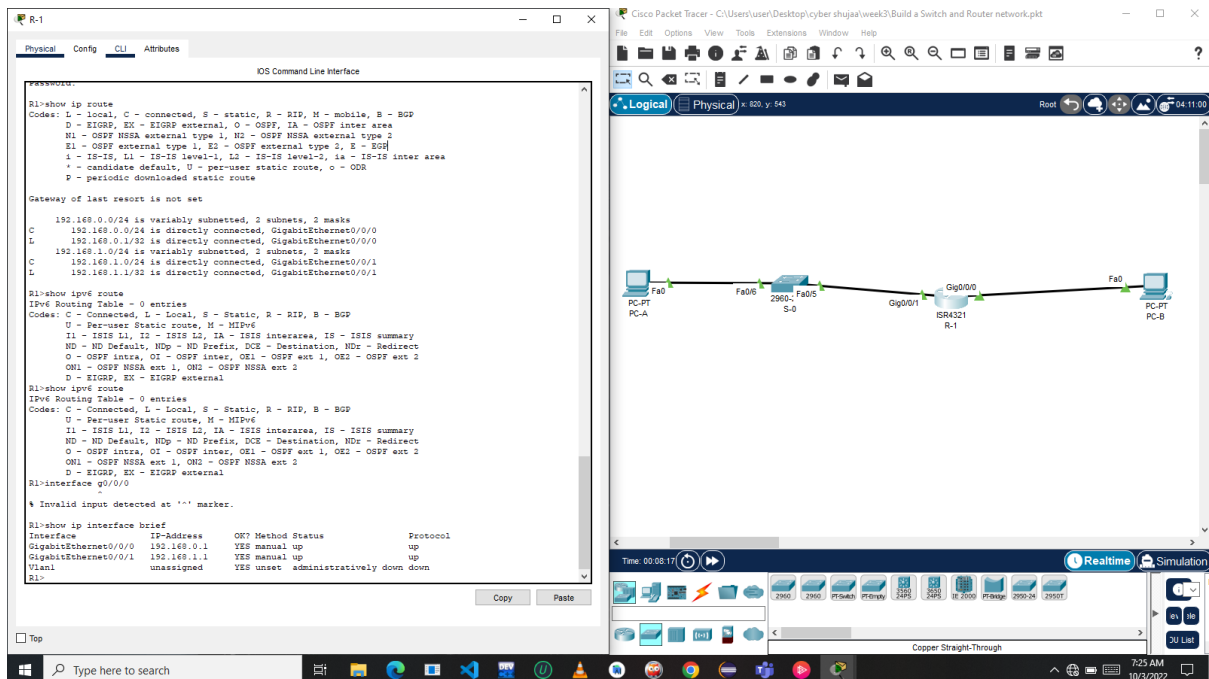
### Part 3: Display Device Information

Step 1: Display the routing table on the router.



Step 2: Display interface information on the router R1.

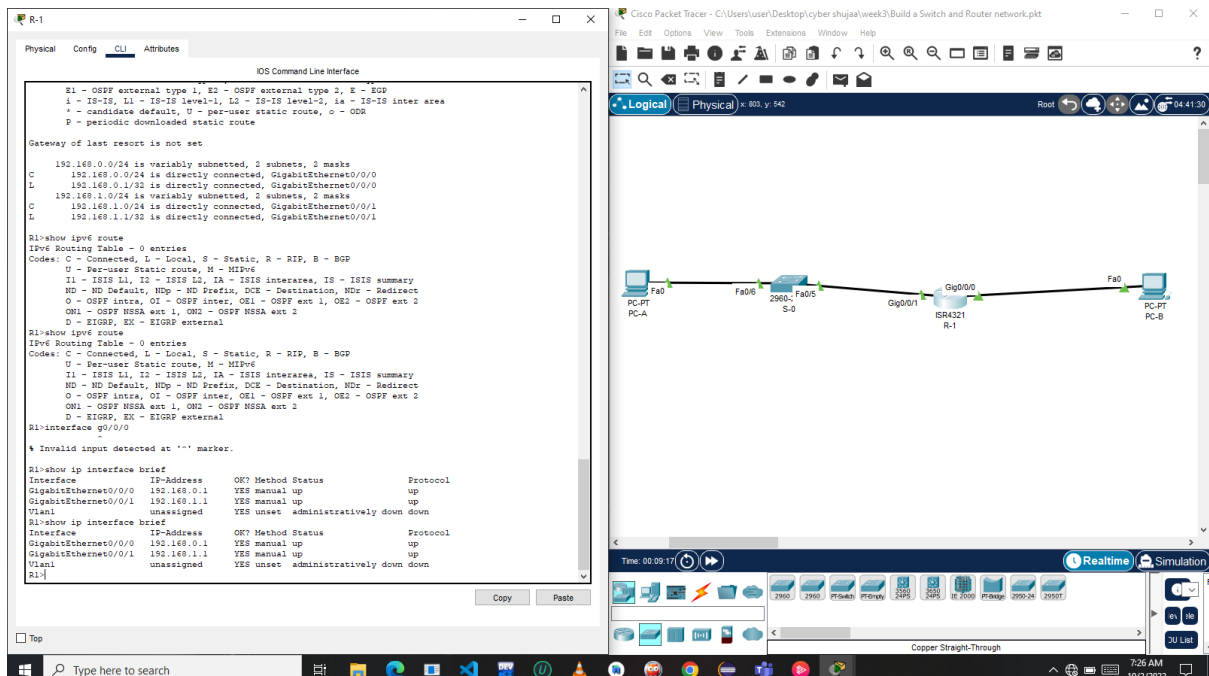
a. Use the show ip interface g0/0/1 to answer the following questions.



What is the operational status of the G0/0/1 interface? GigabitEthernet0/0/1 is up, line protocol is up

How is the Internet address displayed in this command? Internet address is 192.168.1.1/24.

Step 3: Display a summary list of the interfaces on the router and switch



R1(config-if)# no shutdown.

PC-A would not be able to ping PC-B. This is because PC-B is on a different network than PC-A which requires the default-gateway router to route these packets. PC-A is configured to use the IP address of 192.168.1.1 for the default-gateway router, but this address is not assigned to any device on the

LAN. Any packets that need to be sent to the default-gateway for routing will never reach their destination.