# Advanced Computer Networks (IT-451)

# PRACTICAL FILE


**University School of Information, Communication and Technology**
**Guru Gobind Singh Indraprastha University, Delhi**

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**Batch:** B. Tech (CSE) 7th Semester
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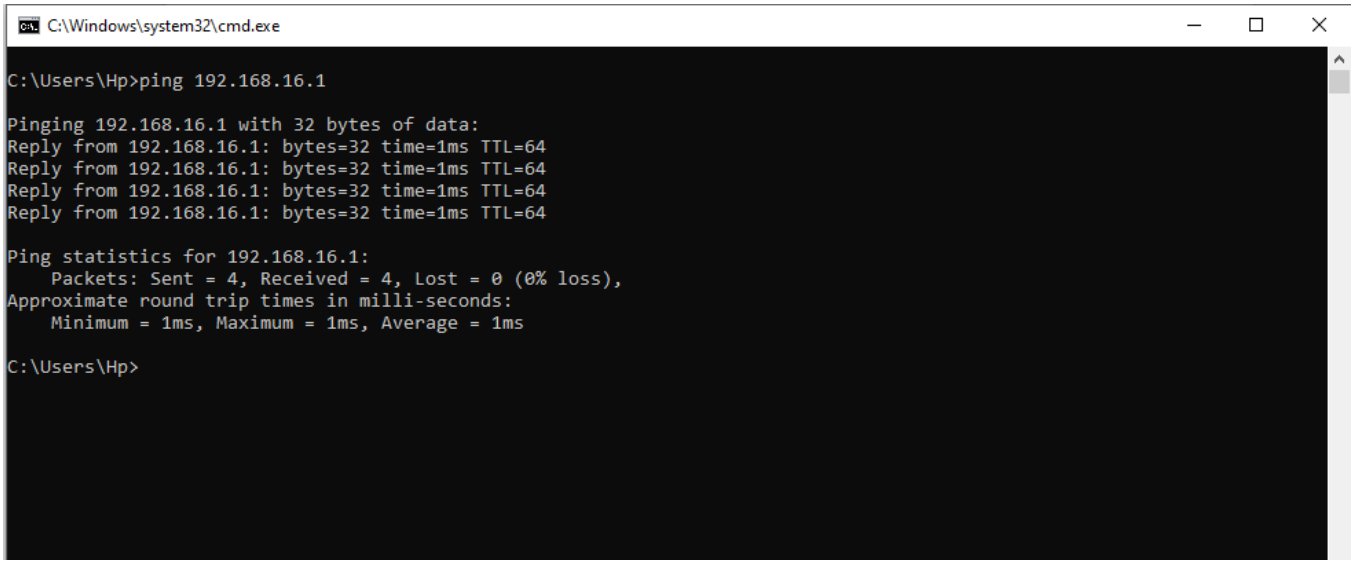
# INDEX

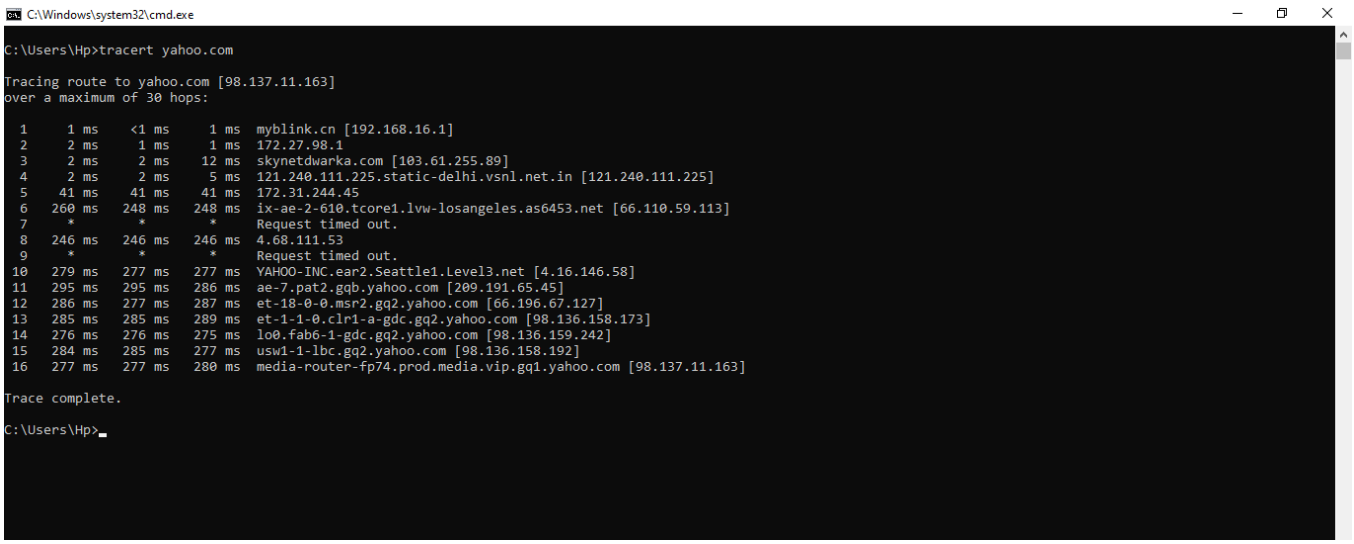
# Program No. 1

# To configure network settings and learn few networking commands

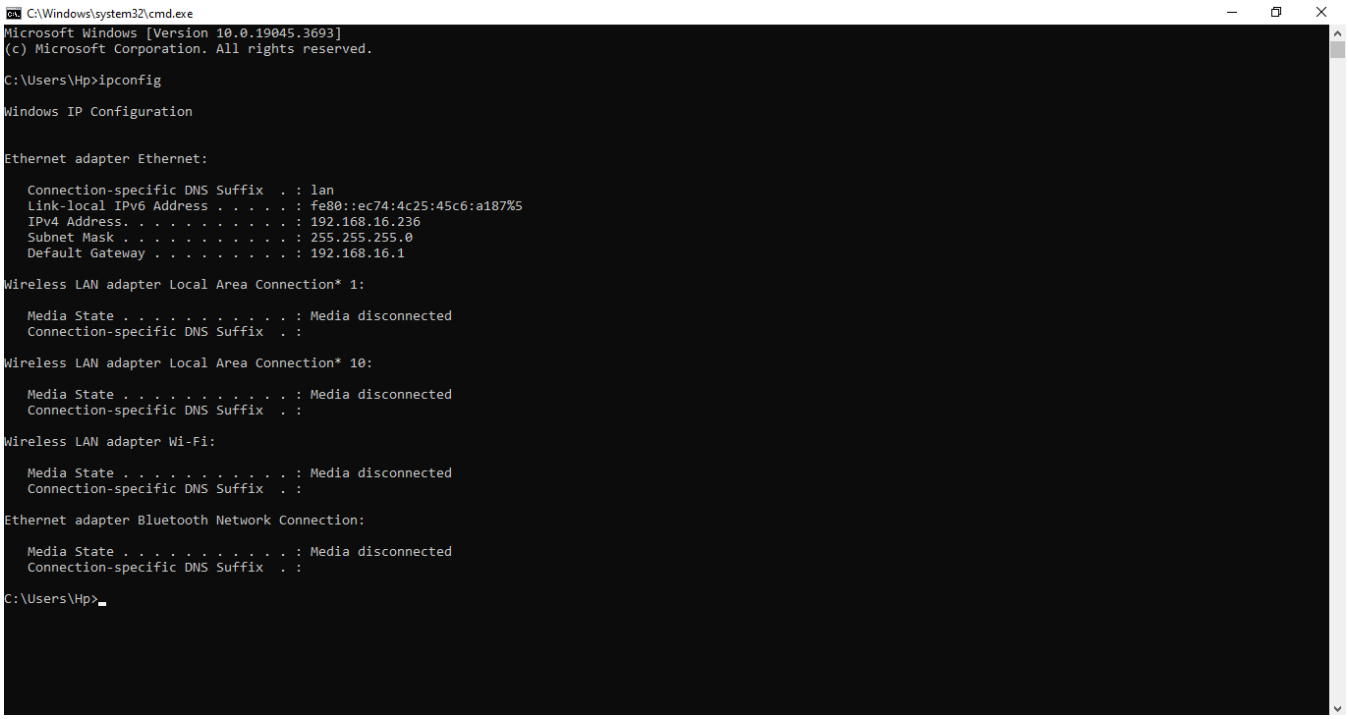
1. **"ping" -** This command is used to test the connectivity between two devices on a network. It sends a small packet of data to a specified device and waits for a response.



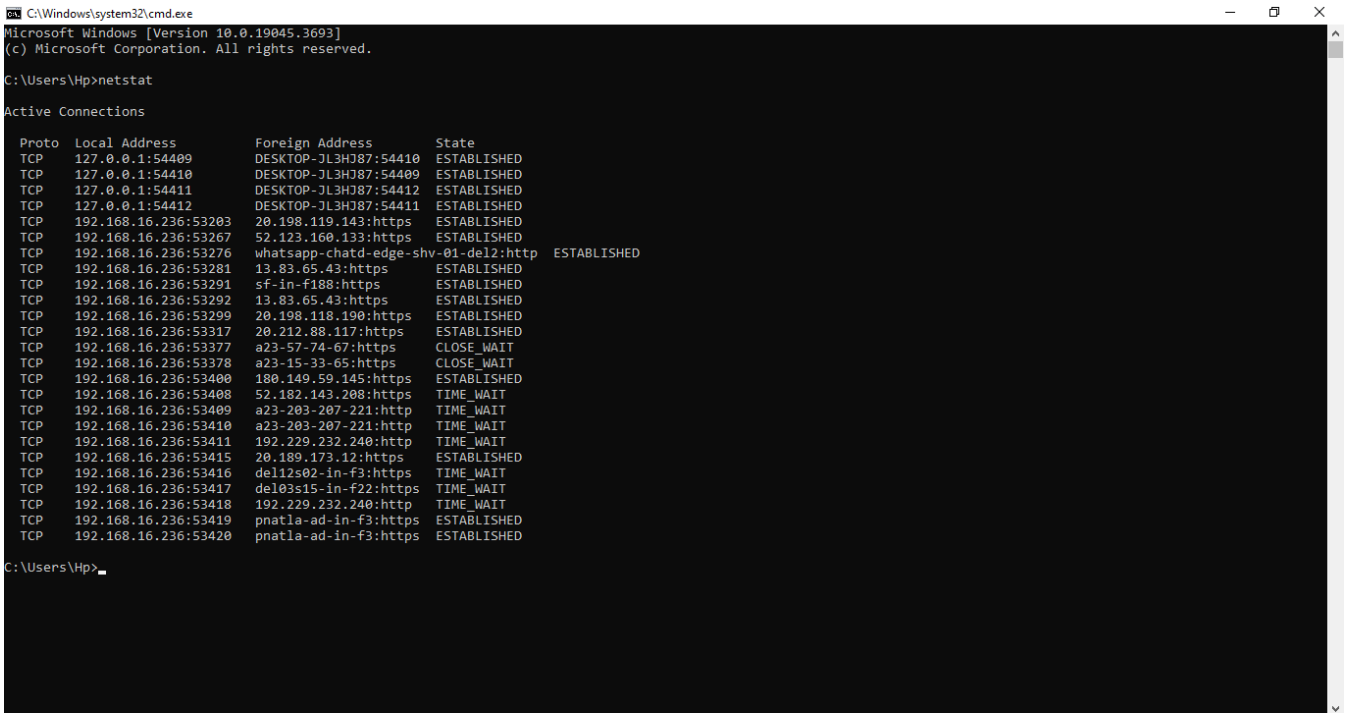

2. **"tracert" -** This command is used to trace the route that a packet takes from the source device to the destination device. It can be useful for identifying network issues or bottlenecks.



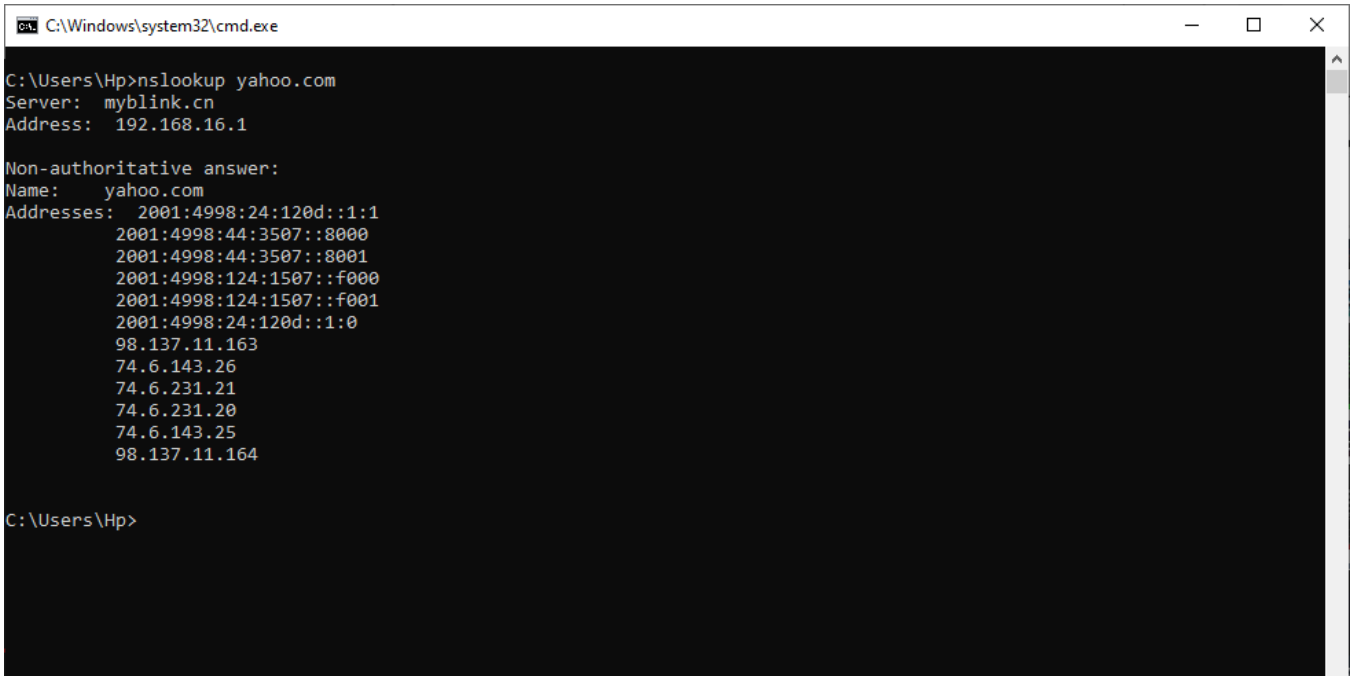

3. **"ipconfig" -** This command displays the IP configuration of the local device, including the IP address, subnet mask, and default gateway.



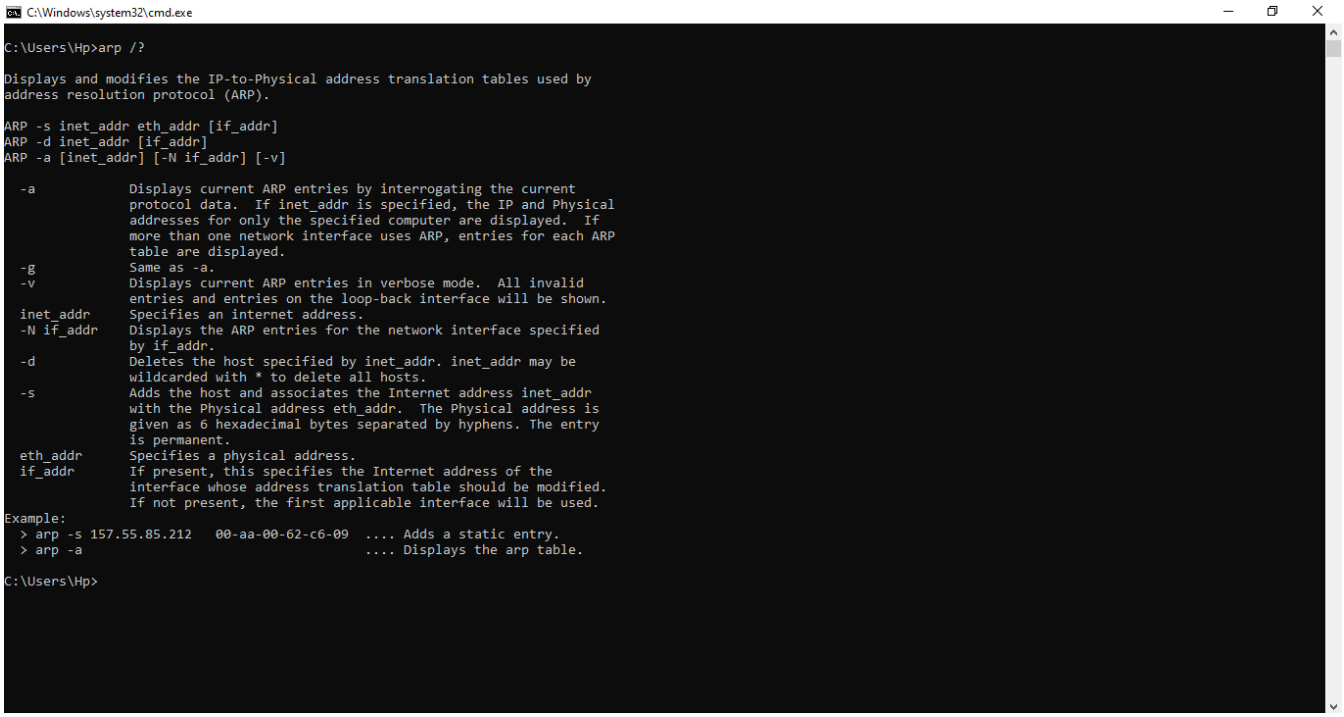

4. **"netstat"** - This command displays active network connections and the status of TCP and UDP ports on the local device.



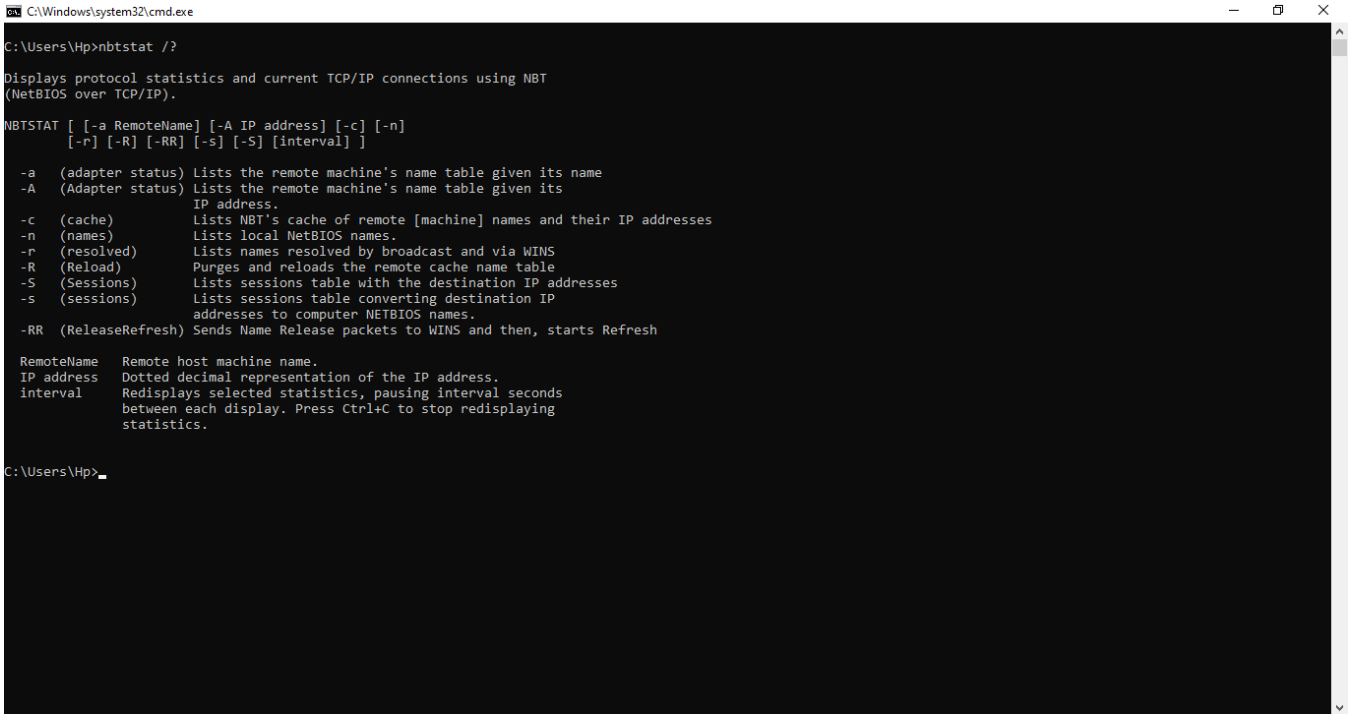

5. **"nslookup" -** This command is used to query DNS servers for information about a domain or hostname.



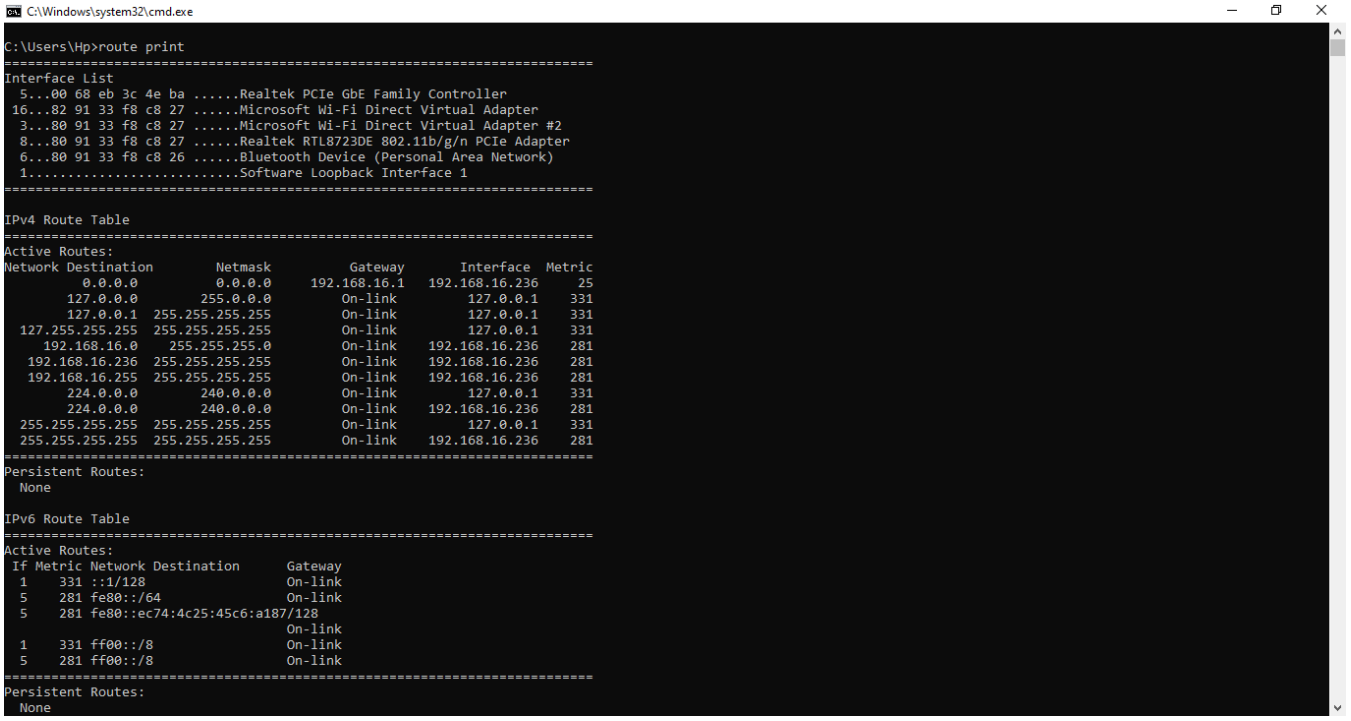

6. **"arp" -** This command is used to display and modify the Address Resolution Protocol (ARP) cache, which is used to map IP addresses to physical addresses on a network.




7. **"nbtstat" -** This command is used to display statistics and information about NetBIOS over TCP/IP connections on a device.




8. **"route" -** This command is used to display and modify the routing table on a device, which is used to determine the best path for network traffic.



# Program No. 2

# To learn about the color coding of straight through, crossover and rollover cables

**1. Straight-Through Cable:**

- Both ends of the cable have the same wiring sequence.
- Used to connect different types of devices, such as a computer to a switch or router.
- Color code (TIA/EIA-568-B):
  - Pin 1: White/Orange
  - Pin 2: Orange
  - Pin 3: White/Green
  - Pin 4: Blue
  - Pin 5: White/Blue
  - Pin 6: Green
  - Pin 7: White/Brown
  - Pin 8: Brown

**2. Crossover Cable:**

- The wiring at one end of the cable is reversed, allowing two similar devices (like two computers) to be connected directly without the need for a switch or hub.
- Color code (TIA/EIA-568-B):
  - Pin 1: White/Green
  - Pin 2: Green
  - Pin 3: White/Orange
  - Pin 4: Blue
  - Pin 5: White/Blue
  - Pin 6: Orange
  - Pin 7: White/Brown
  - Pin 8: Brown

**3. Rollover Cable (Cisco Console Cable):**

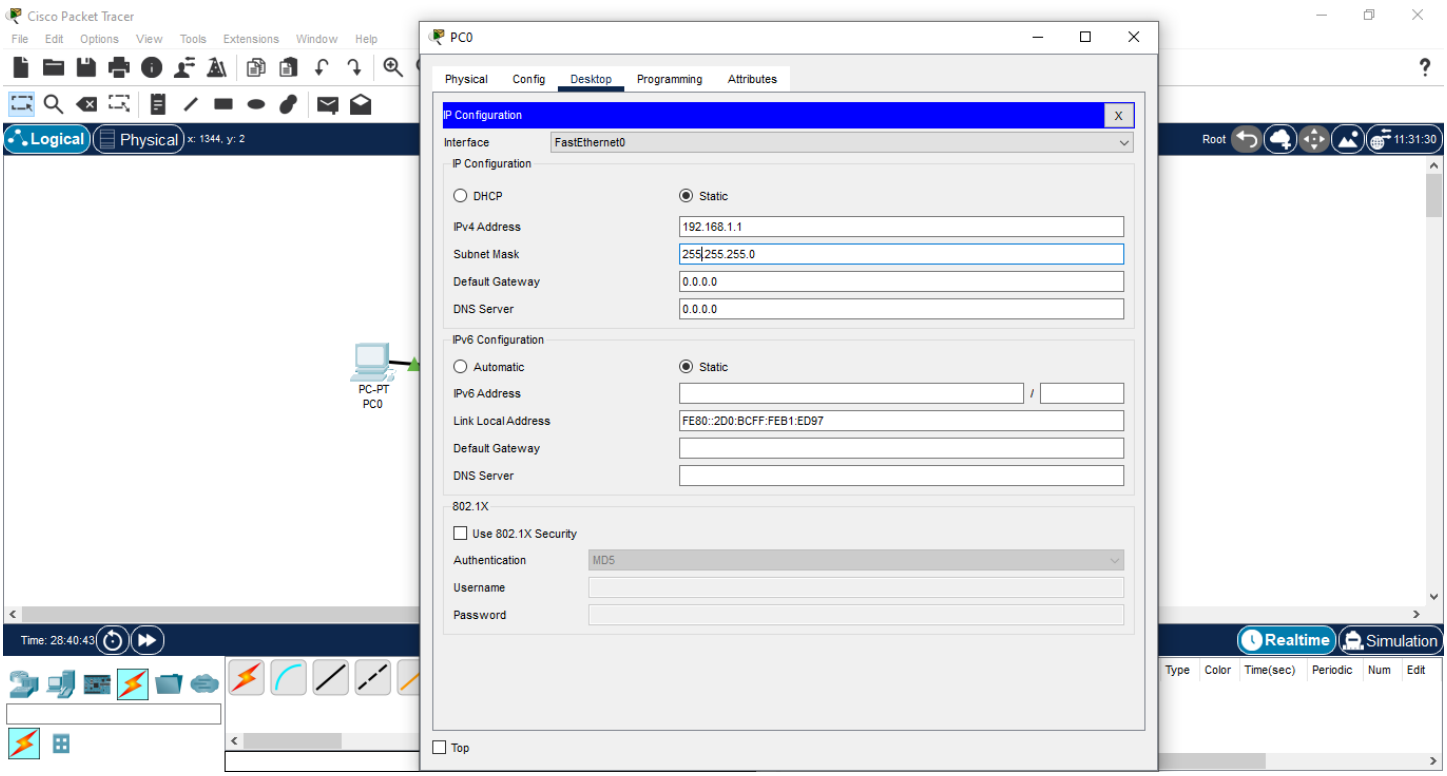
- Used to connect a computer to the console port of a networking device, such as a router or switch.
- The wiring at one end is reversed compared to the other end.
- Color code (Cisco standard):
  - Pin 1: Rolled with Pin 8
  - Pin 2: Rolled with Pin 7
  - Pin 3: Rolled with Pin 6
  - Pin 4: Rolled with Pin 5
  - Pin 5: Rolled with Pin 4
  - Pin 6: Rolled with Pin 3
  - Pin 7: Rolled with Pin 2
  - Pin 8: Rolled with Pin 1

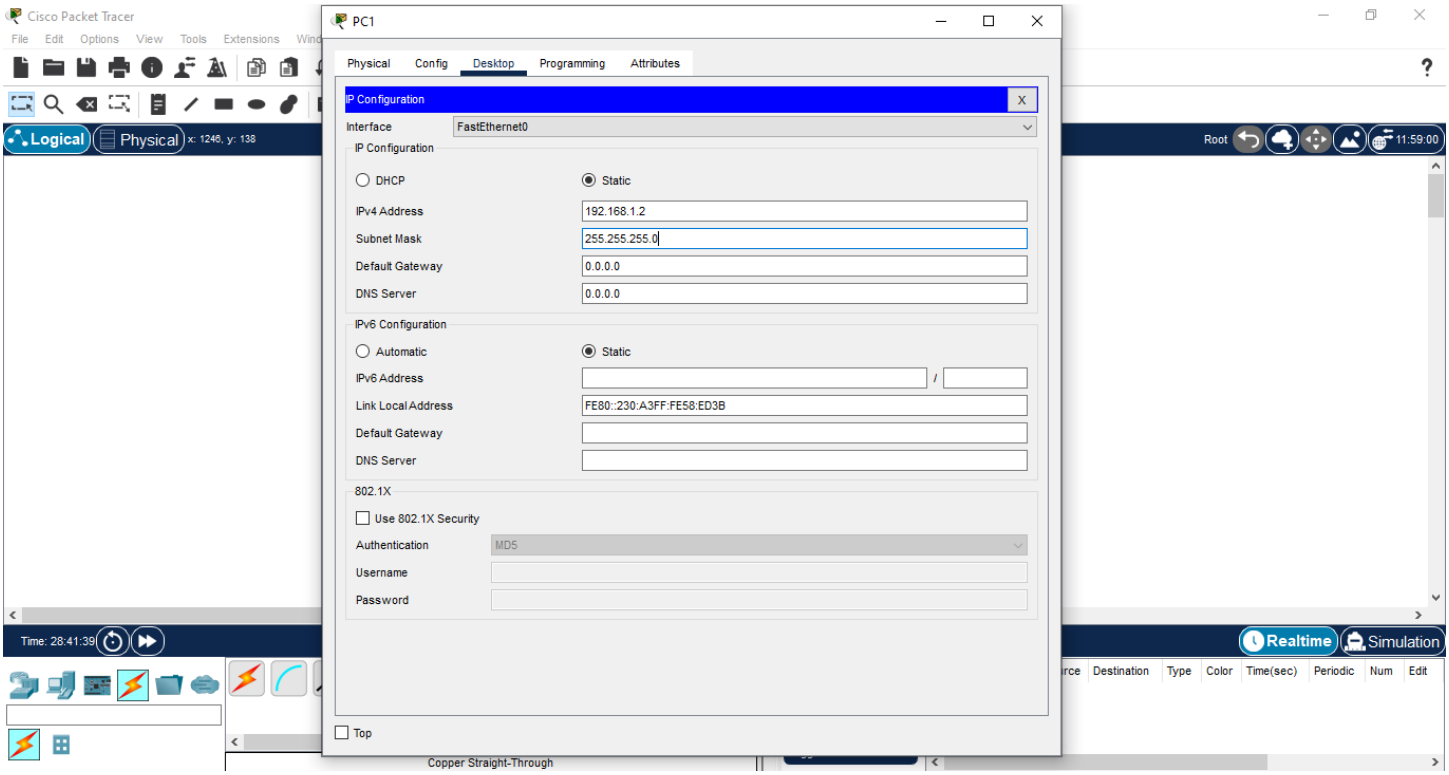
# Program No. 3

# To connect two computers through a hub using cisco packet tracer

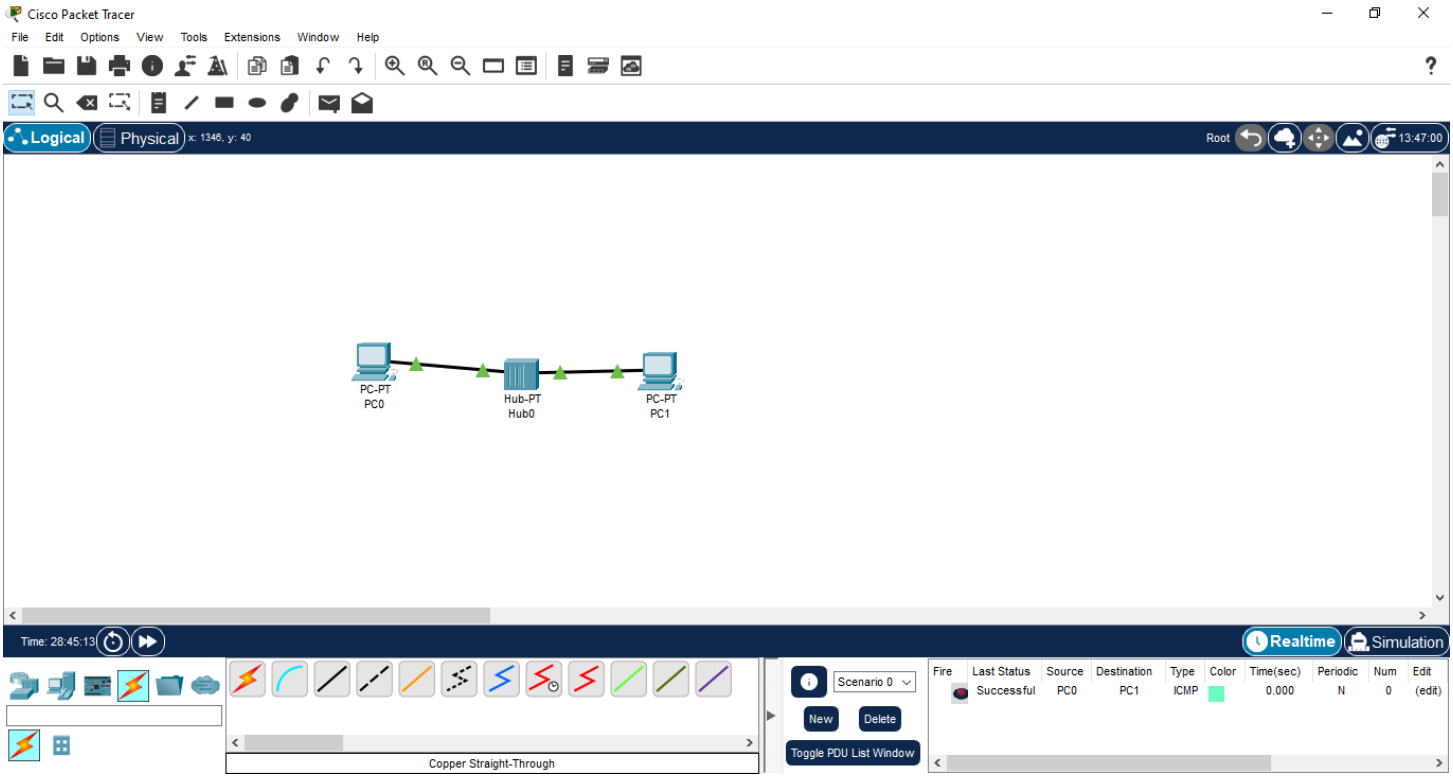
Steps:

1. Open cisco packet tracer
2. Drag 2 PC from end device section
3. Drag a PT hub from network devices section
4. Connect 2 PC with hub using copper straight through cable with fastEthernet port
5. Click on each PC and go to desktop tab under desktop tab click on IP configuration
6. Now configure 2 PC as per below configuration and keep default gateway and DNS server same for all devices






7. Now click on “add simple PDU” then click on each PC

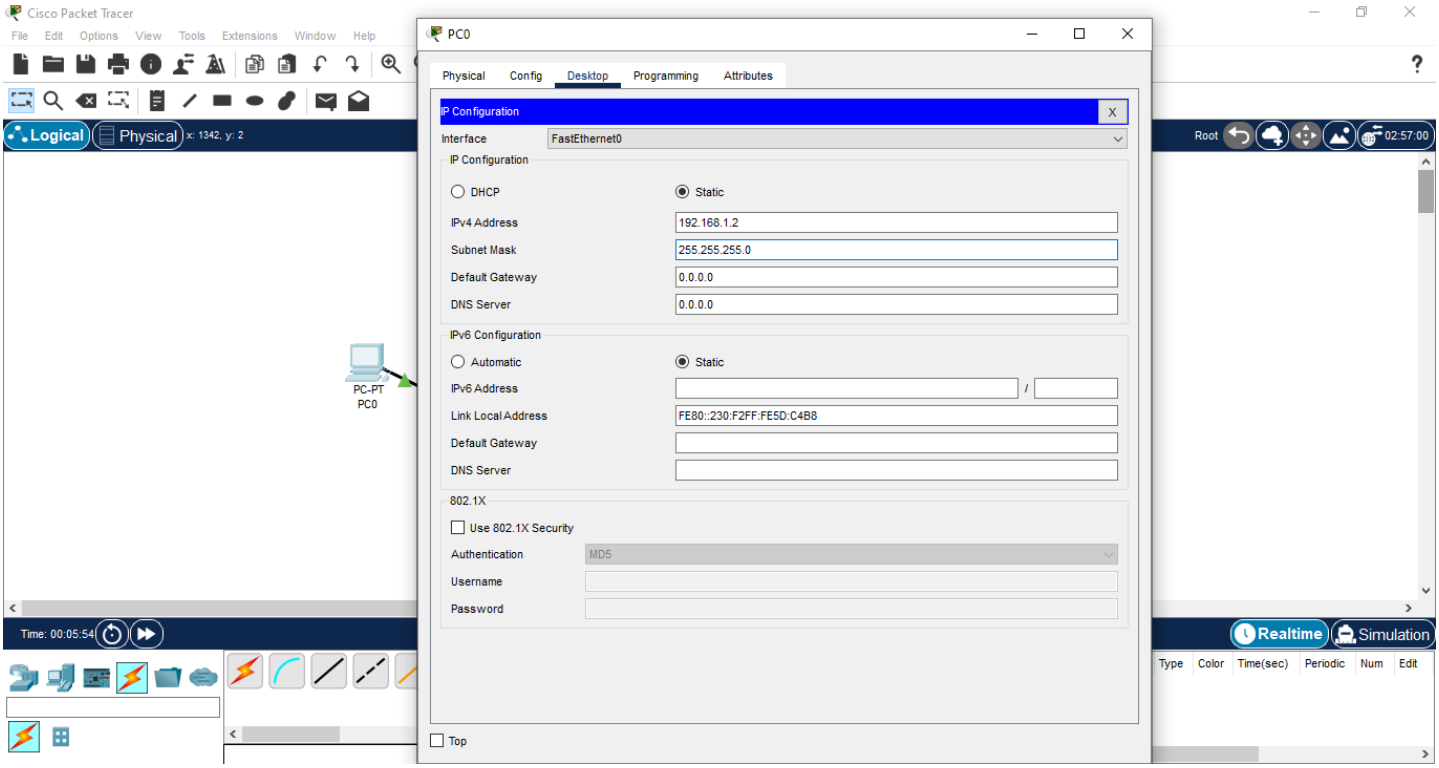


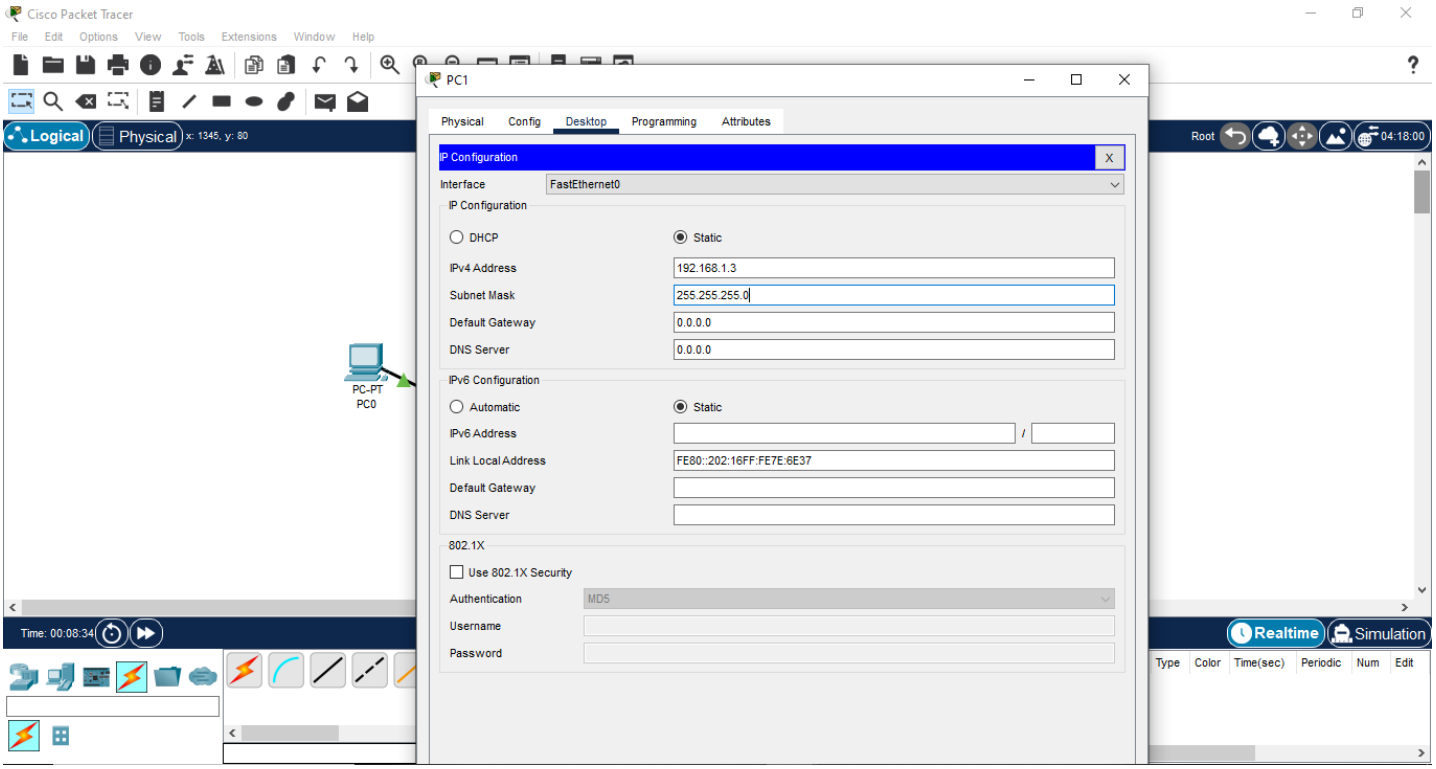
# Program No. 4

# To connect two computers through a switch using cisco packet tracer

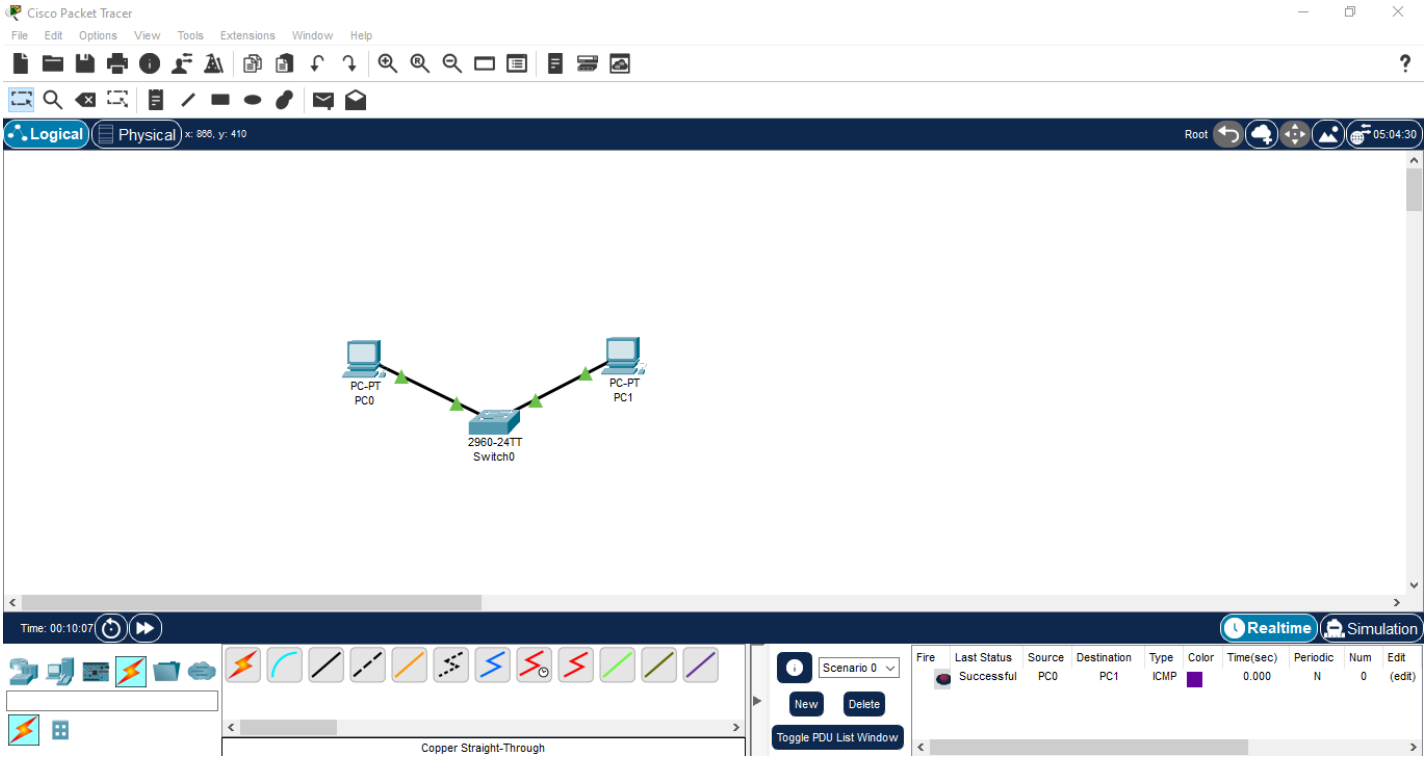
Steps:

1. Open cisco packet tracer
2. Drag 2 PC from end device section
3. Drag a switch from network devices section
4. Connect 2 PC with switch using copper straight through cable with fastEthernet port
5. Click on each PC and go to desktop tab under desktop tab click on IP configuration
6. Now configure 2 PC as per below configuration and keep default gateway and DNS server same for all devices






7. Now click on “add simple PDU” then click on each PC

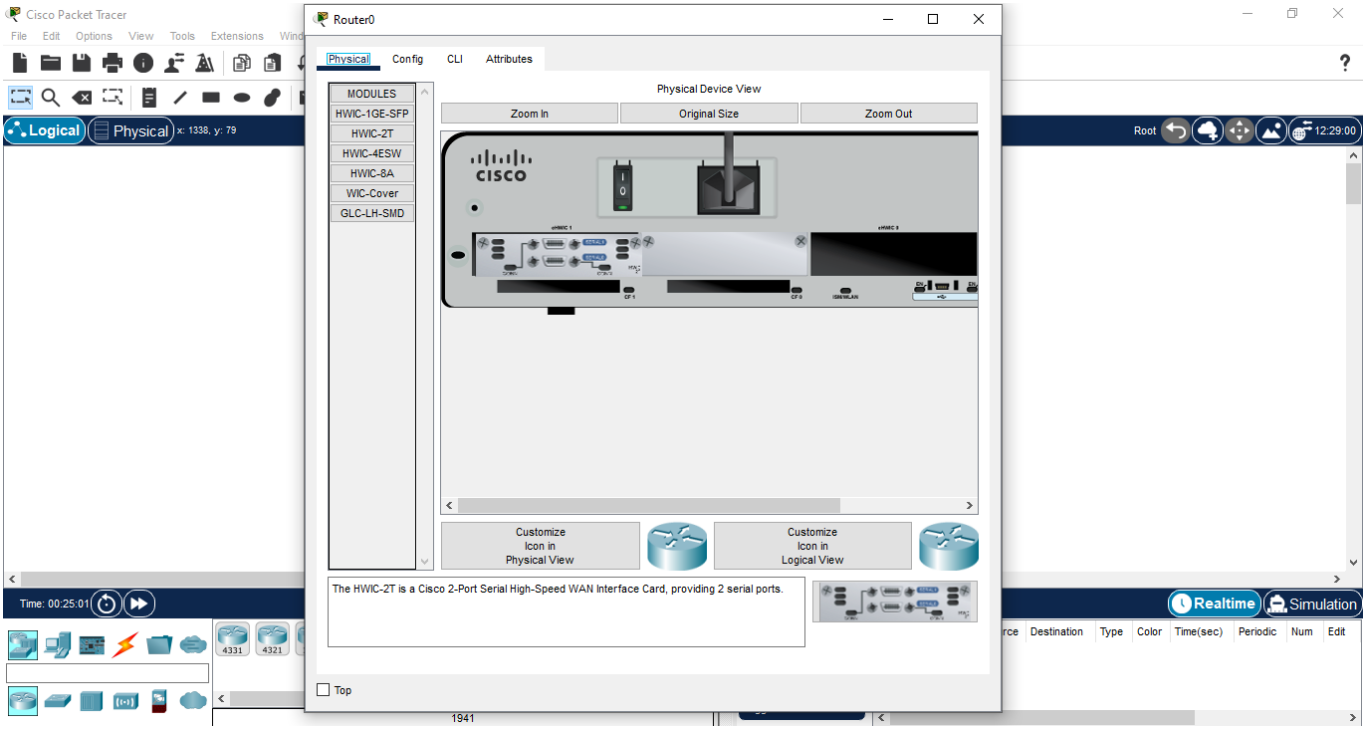


# Program No. 5

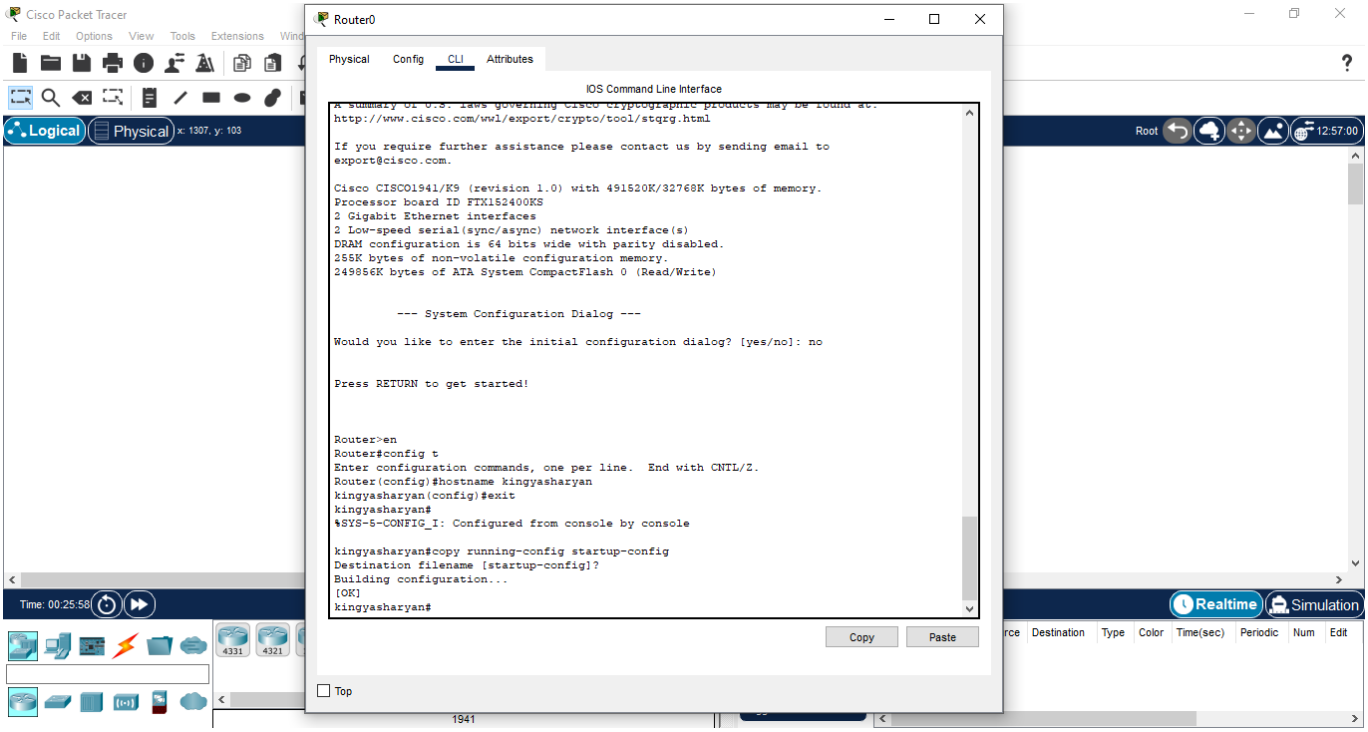
# To configure router using commands in cisco packet tracer

Steps:

1. Select a 1941 router from network device section.
2. Double click the router. Click on Physical tab
3. Turn power off. Drag and drop HWIC-2T from Physical then turn power on

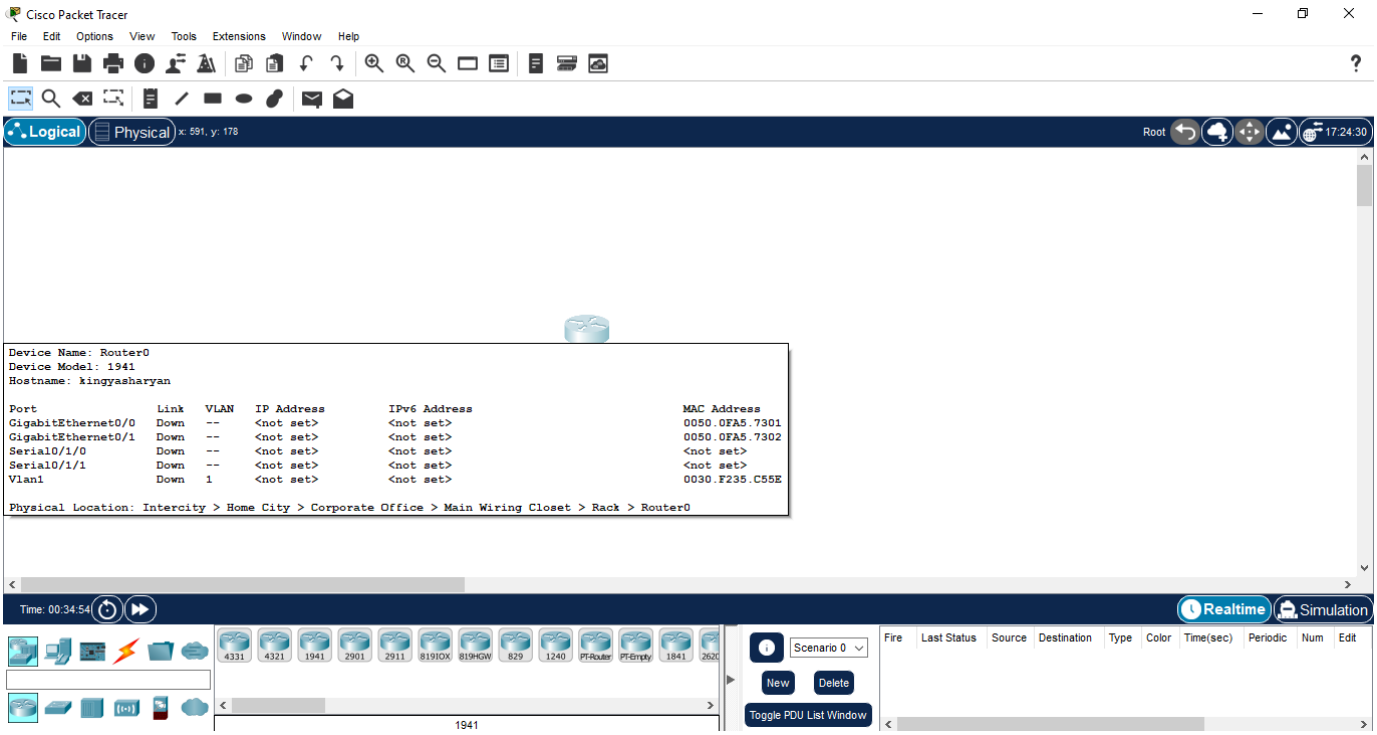



4. Configure the router through CLI using the following commands



```
         --- System Configuration Dialog ---

Would you like to enter the initial configuration dialog? [yes/no]: no


Press RETURN to get started!



Router>en
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#hostname kingyasharyan
kingyasharyan(config)#exit
kingyasharyan#
%SYS-5-CONFIG_I: Configured from console by console

kingyasharyan#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
```

5. Power off. Then power on

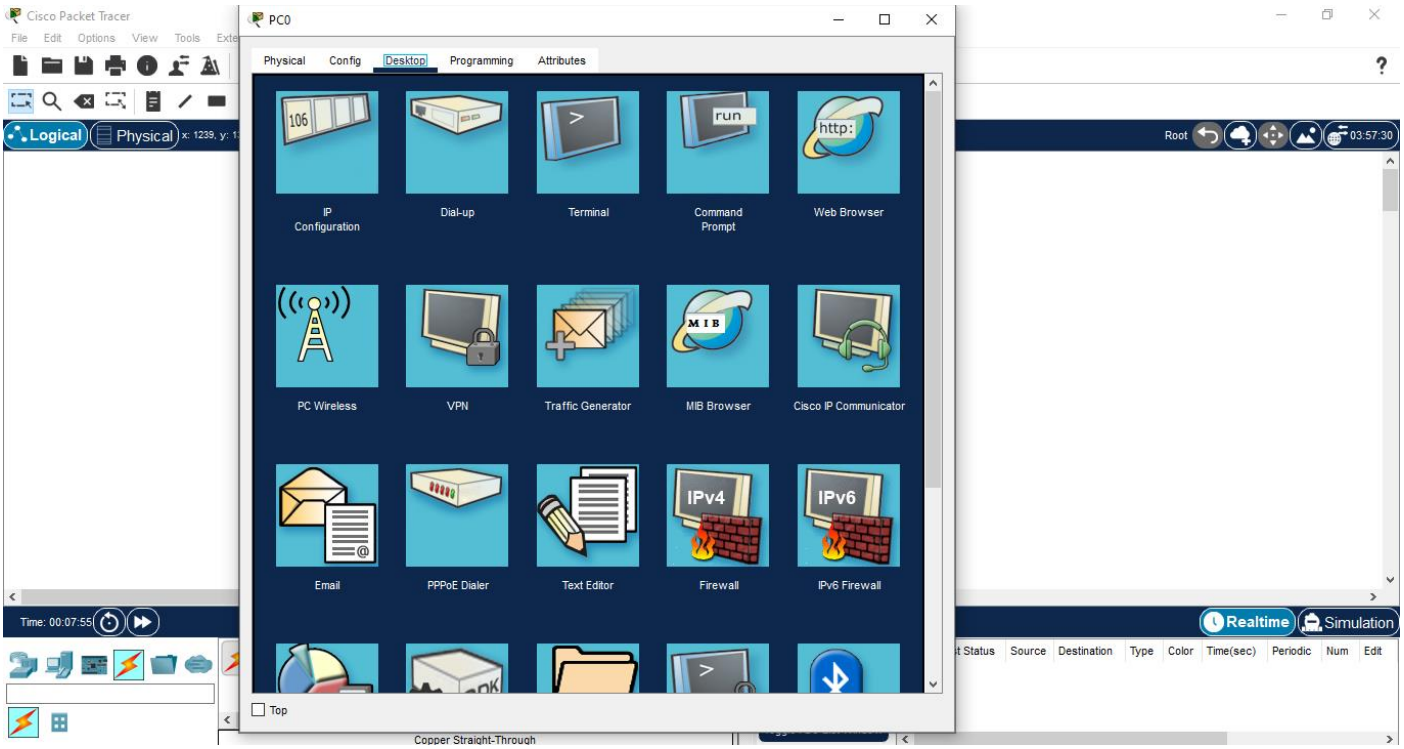


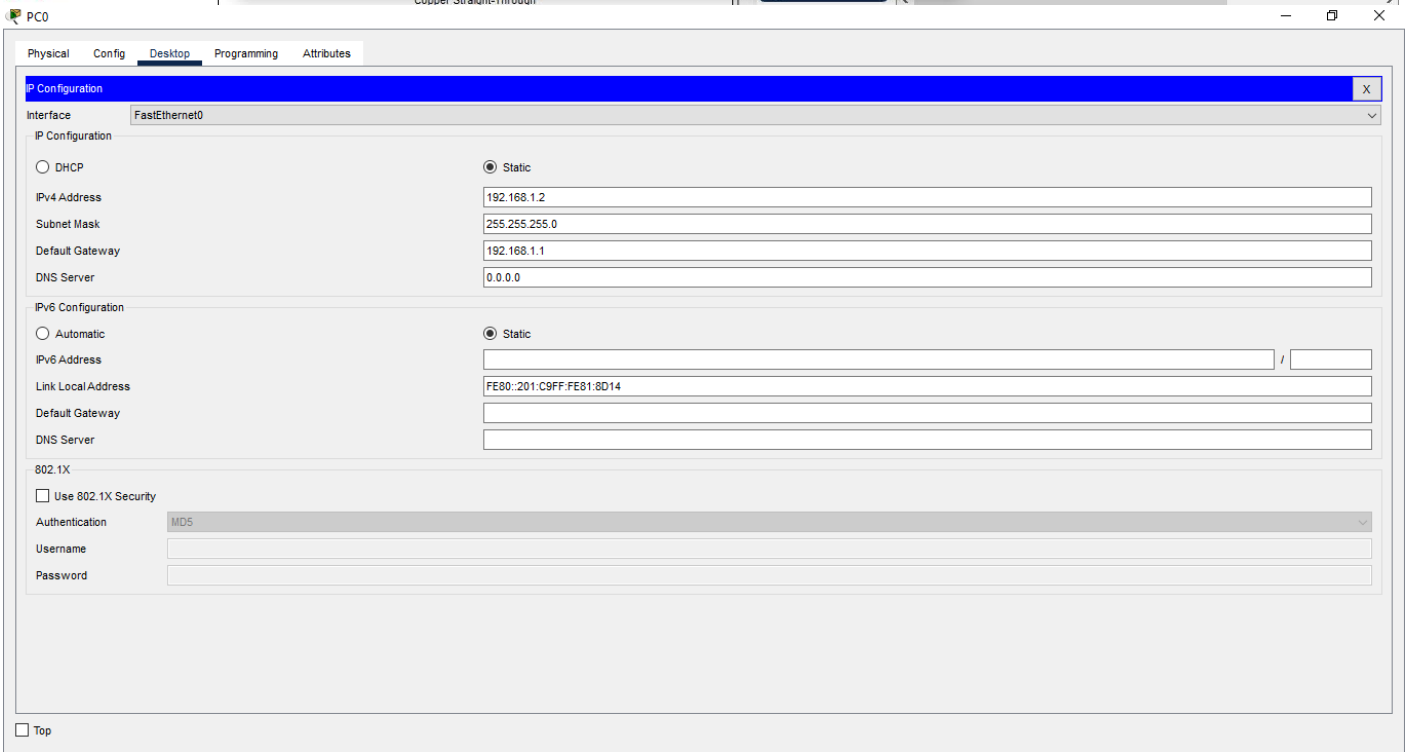
# Program No. 6

# To connect two computers through router using cisco packet tracer

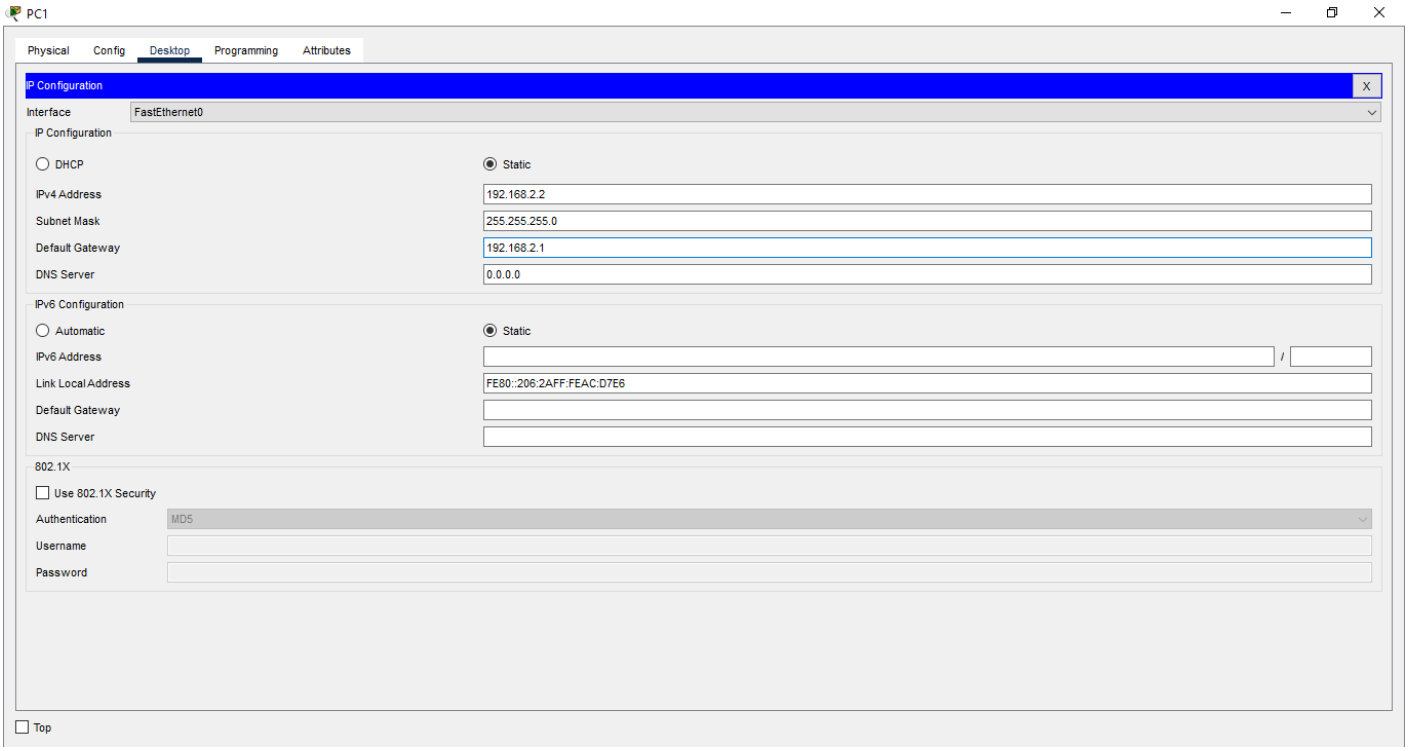
Steps:

1. Select 2 PC from end devices section
2. Select a 4321 router from network devices section
3. Connect 2 PC with router using copper straight through cable with fastEthernet port
4. Click on PC0 and configure it as shown below

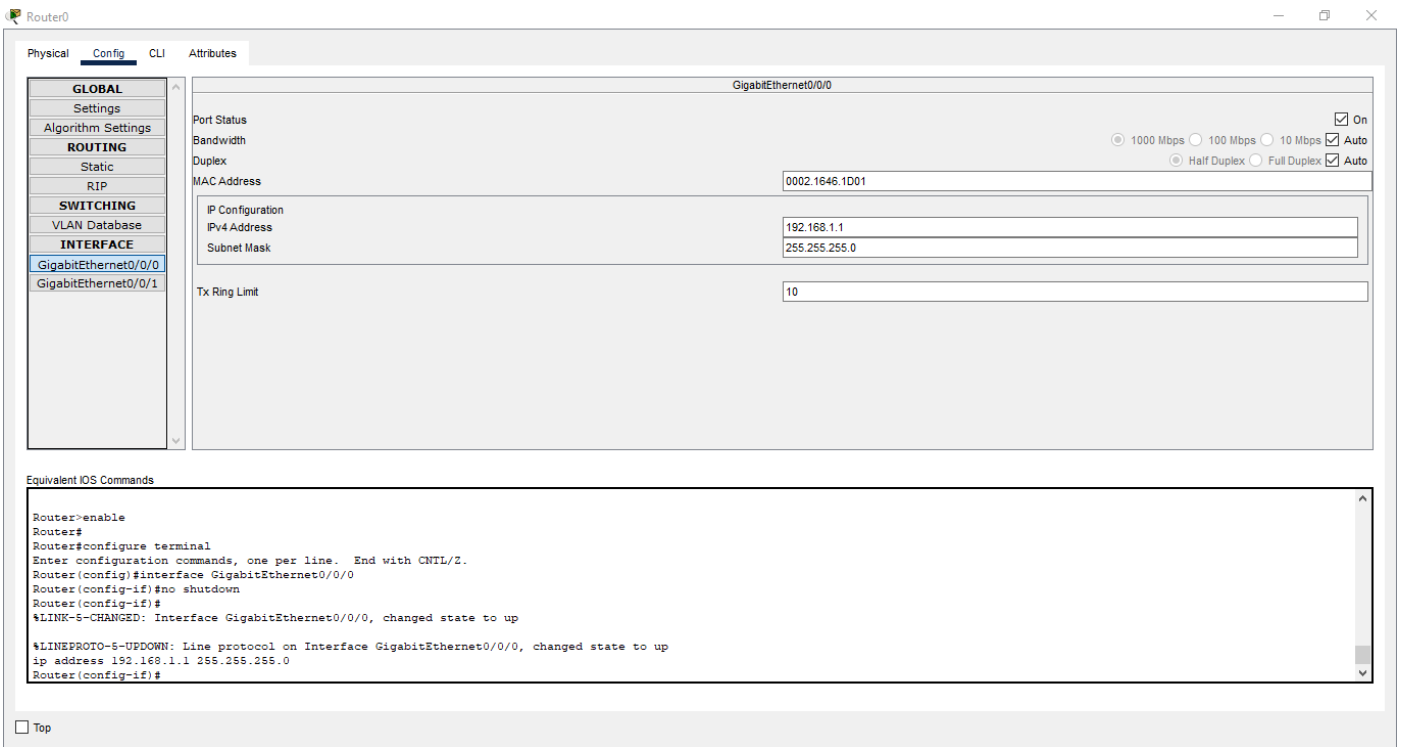


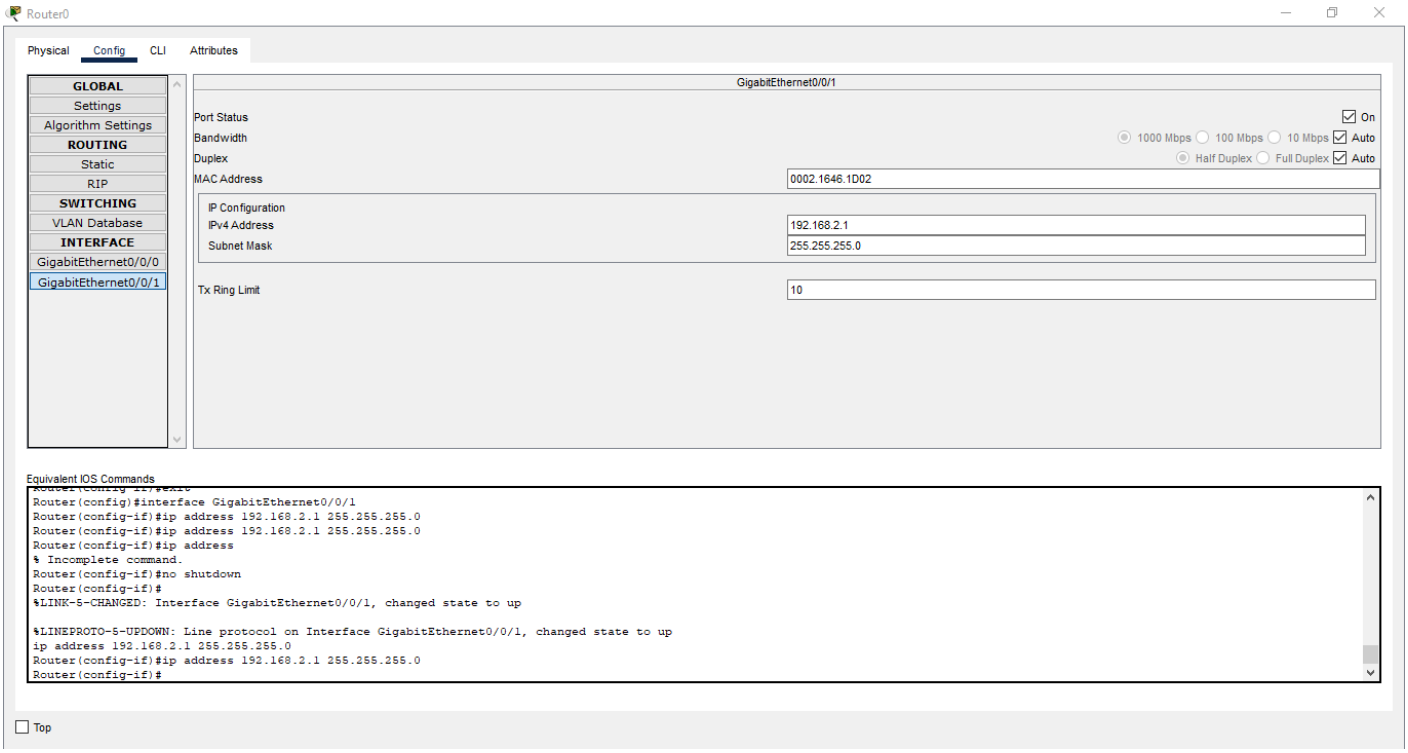




5. Now click on PC1 and configure it as shown below

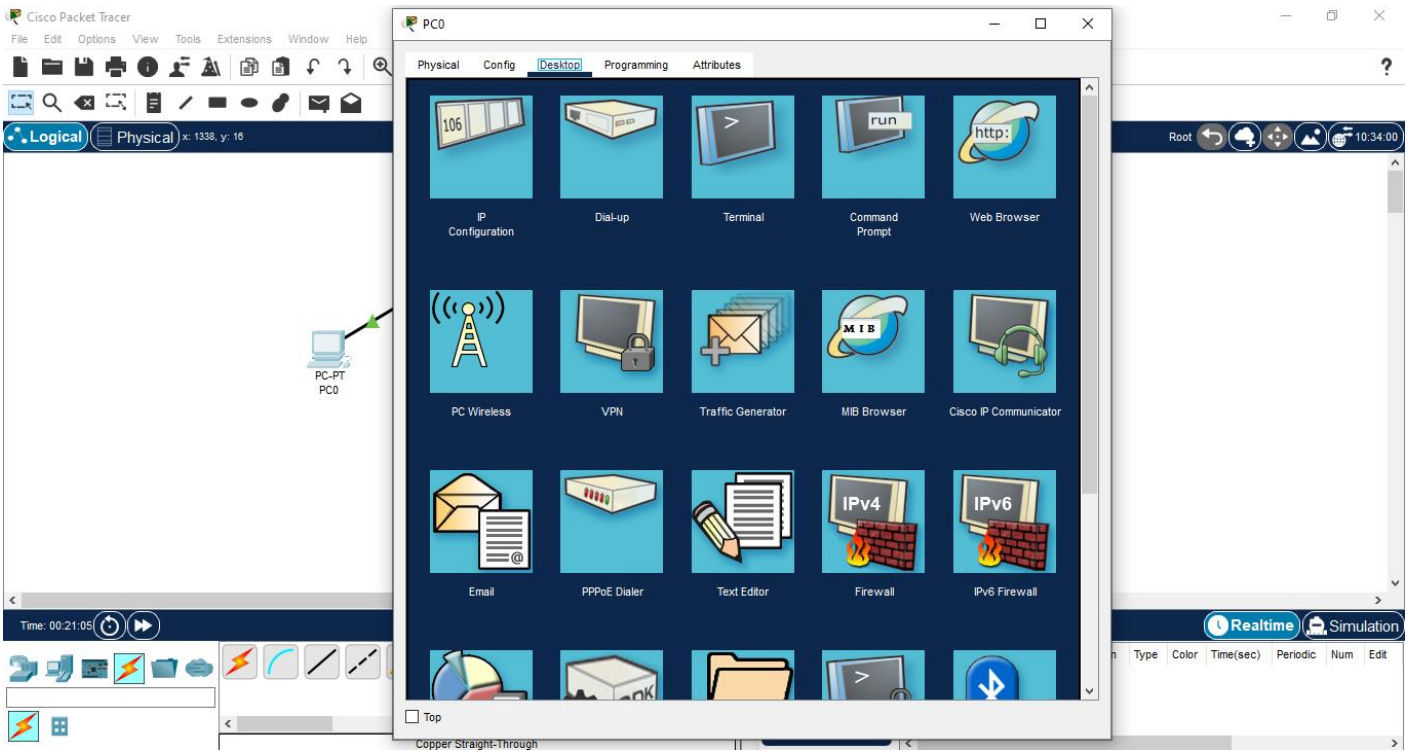



6. Click on router and configure it as shown below

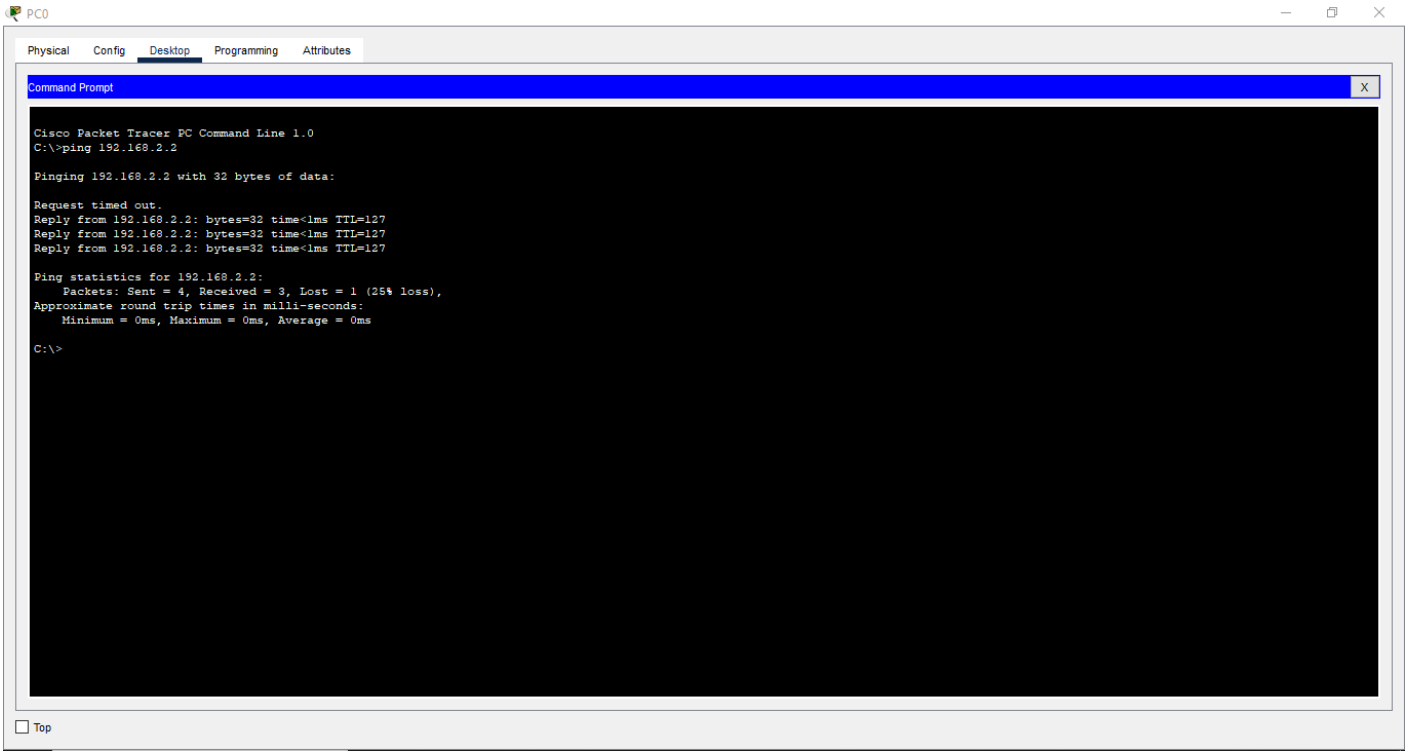




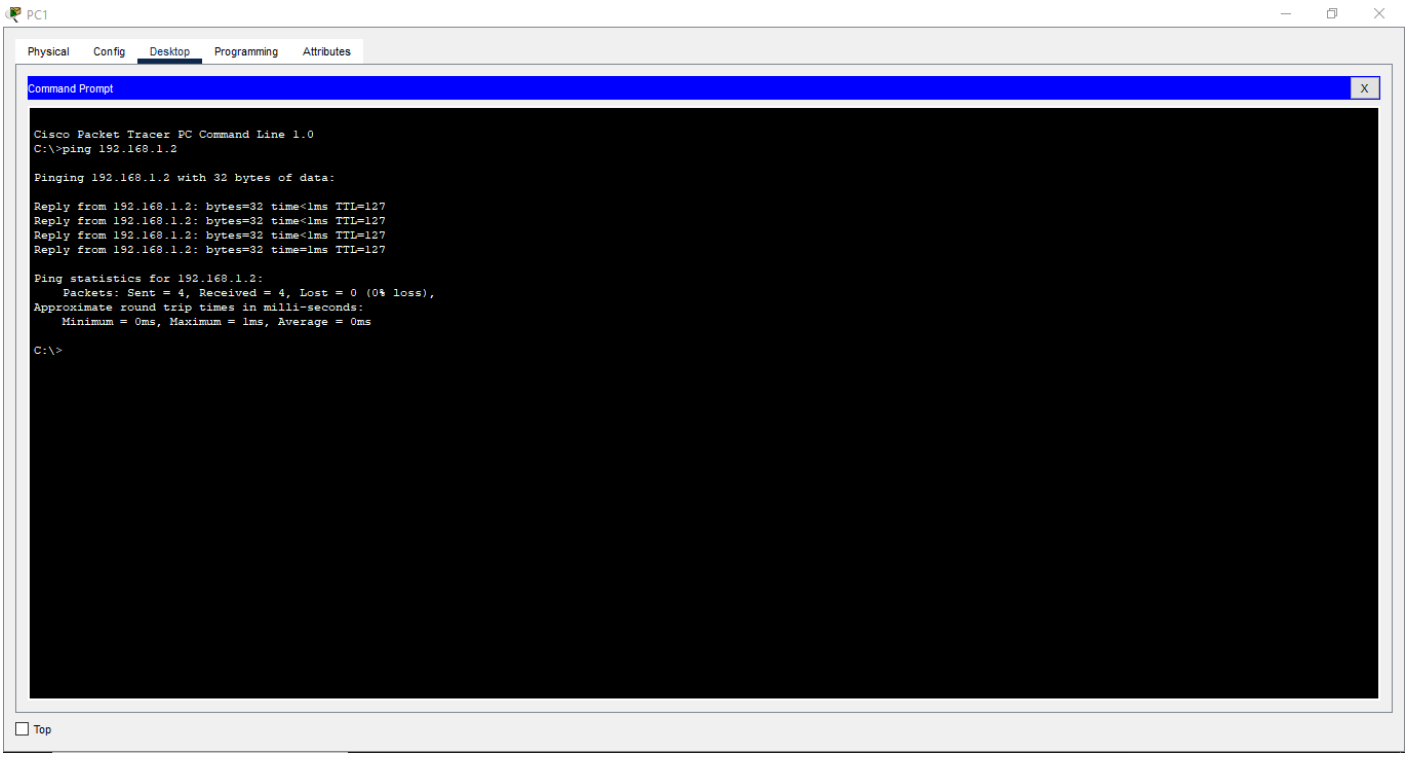

7. Now open command prompt of PC0 by clicking on it as shown below




8. Now enter commands as shown below




9. Now open command prompt of PC1 and enter the commands as shown below

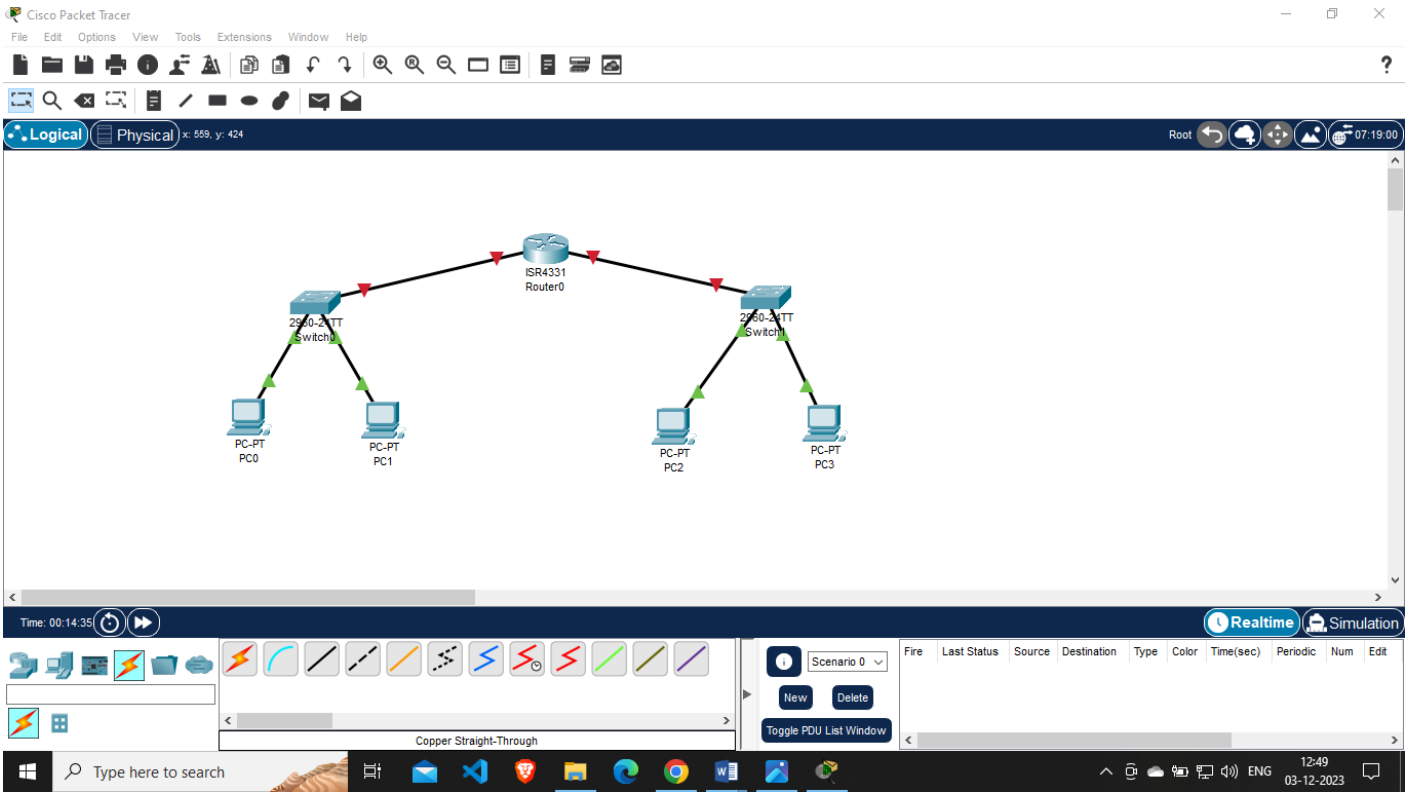


# Program No. 7

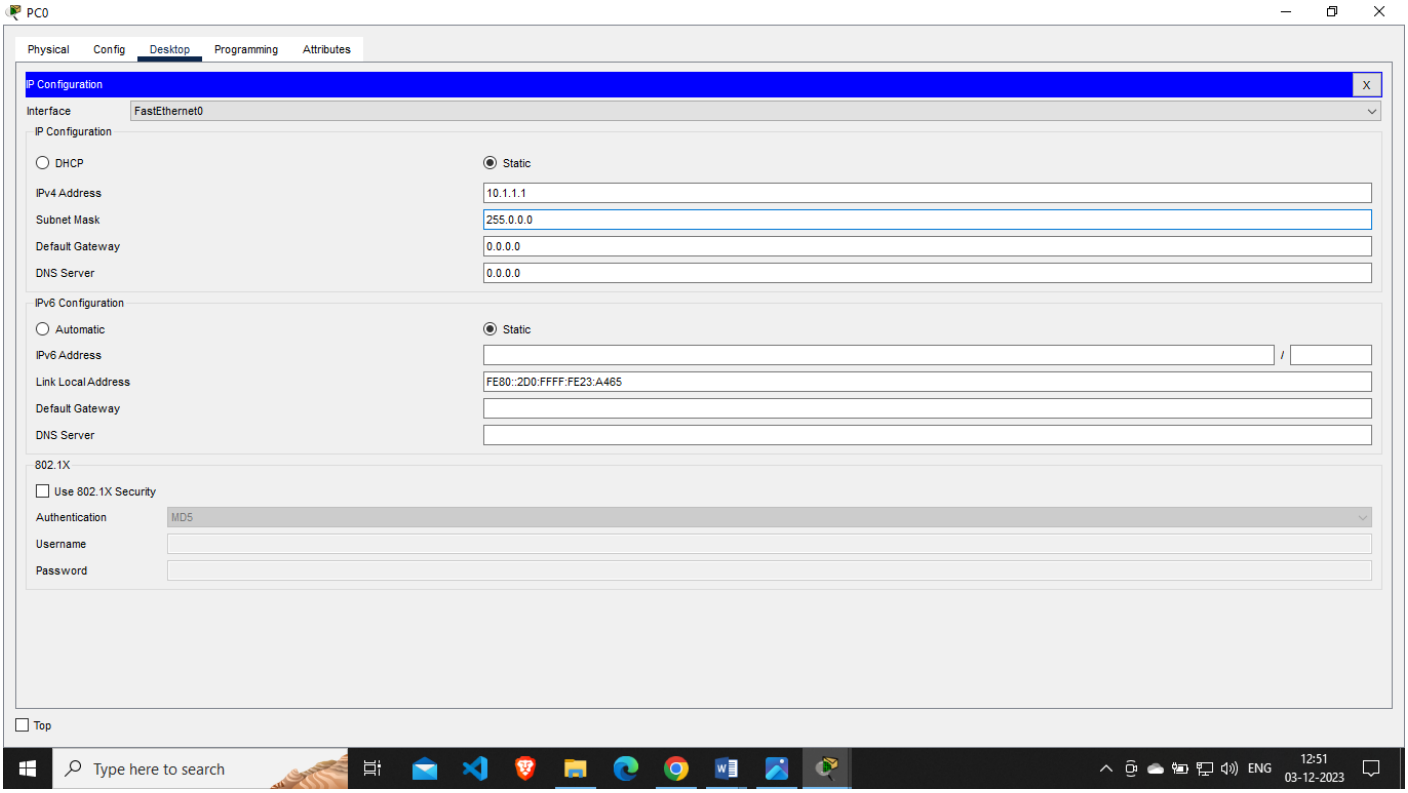
# To connect two networks through a switch in each network and a router common to two networks

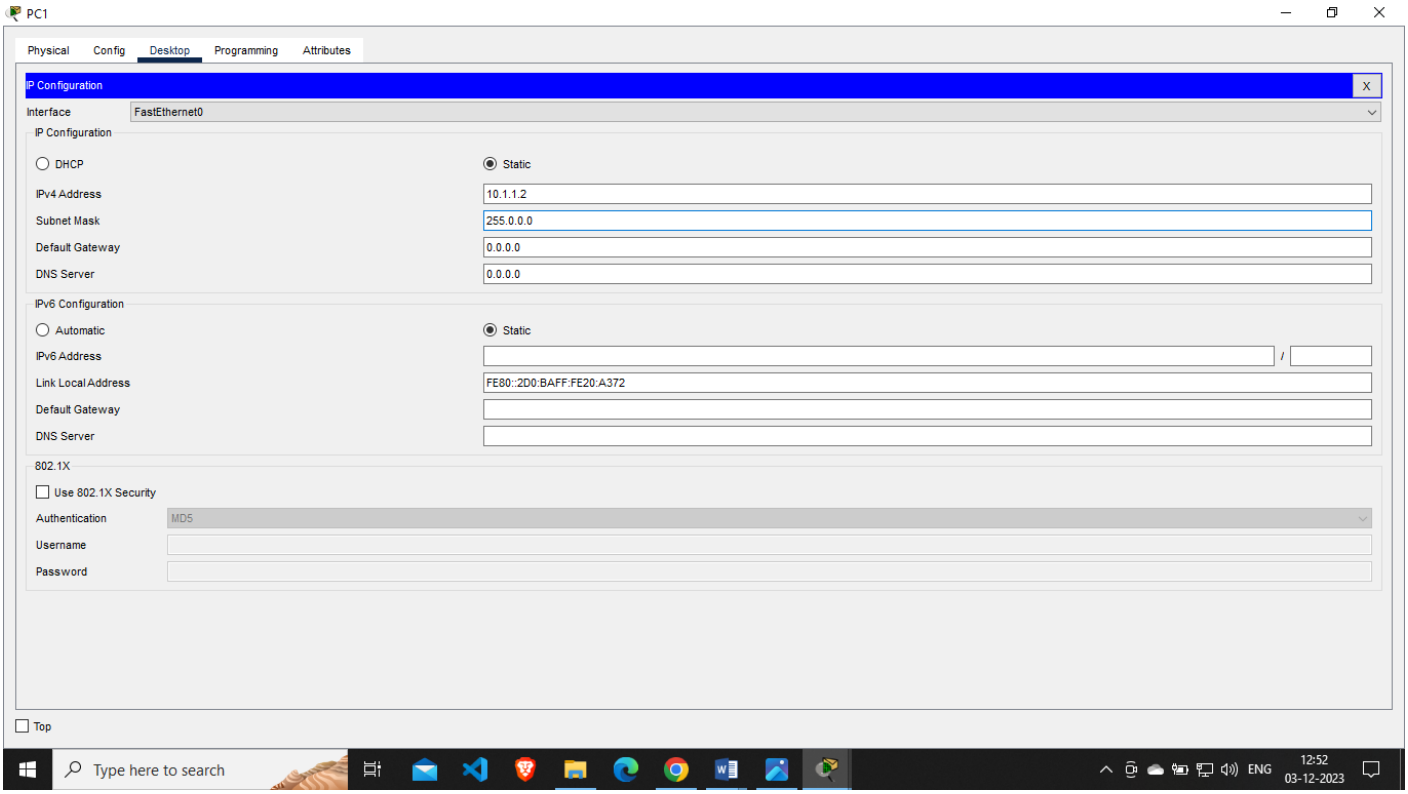
Steps:

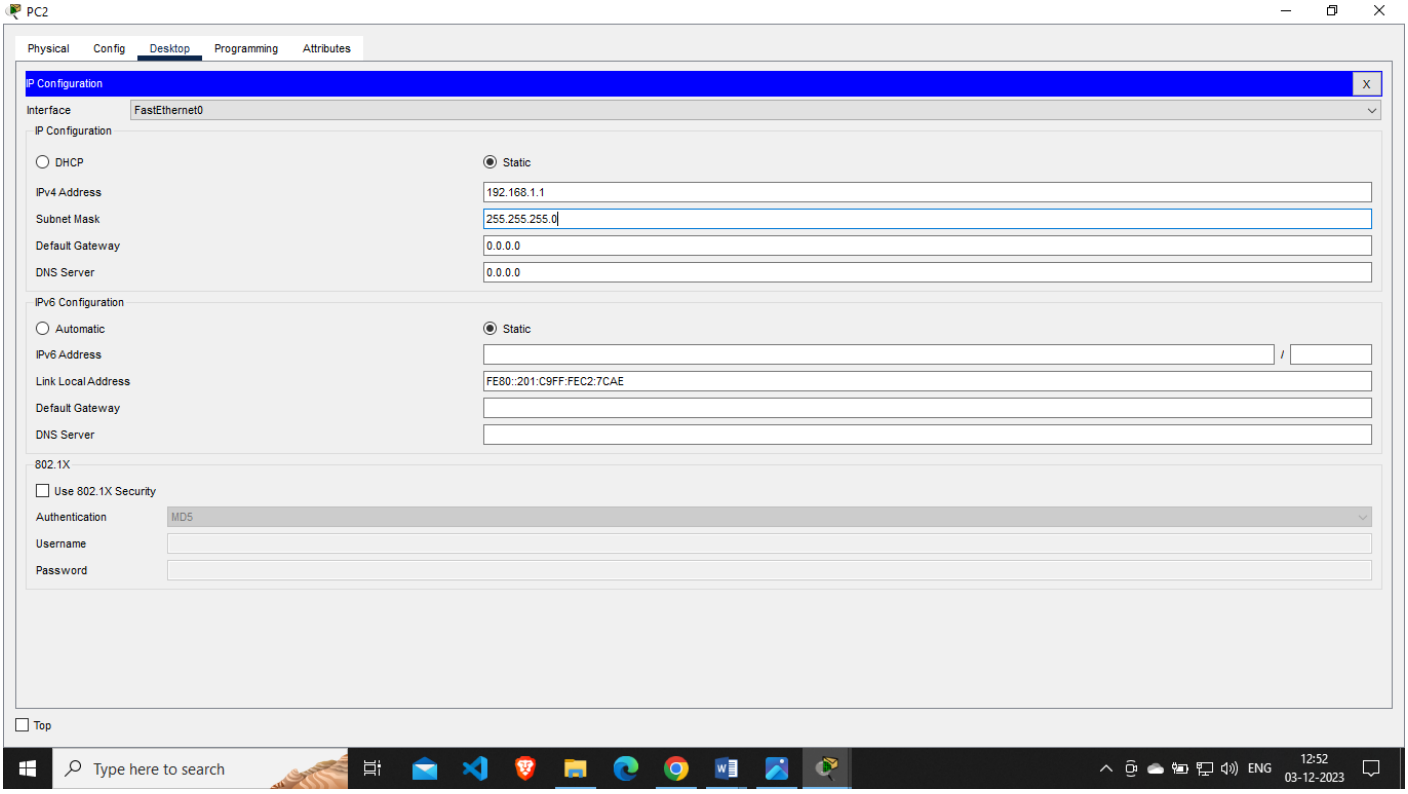
1. Make connections as shown below

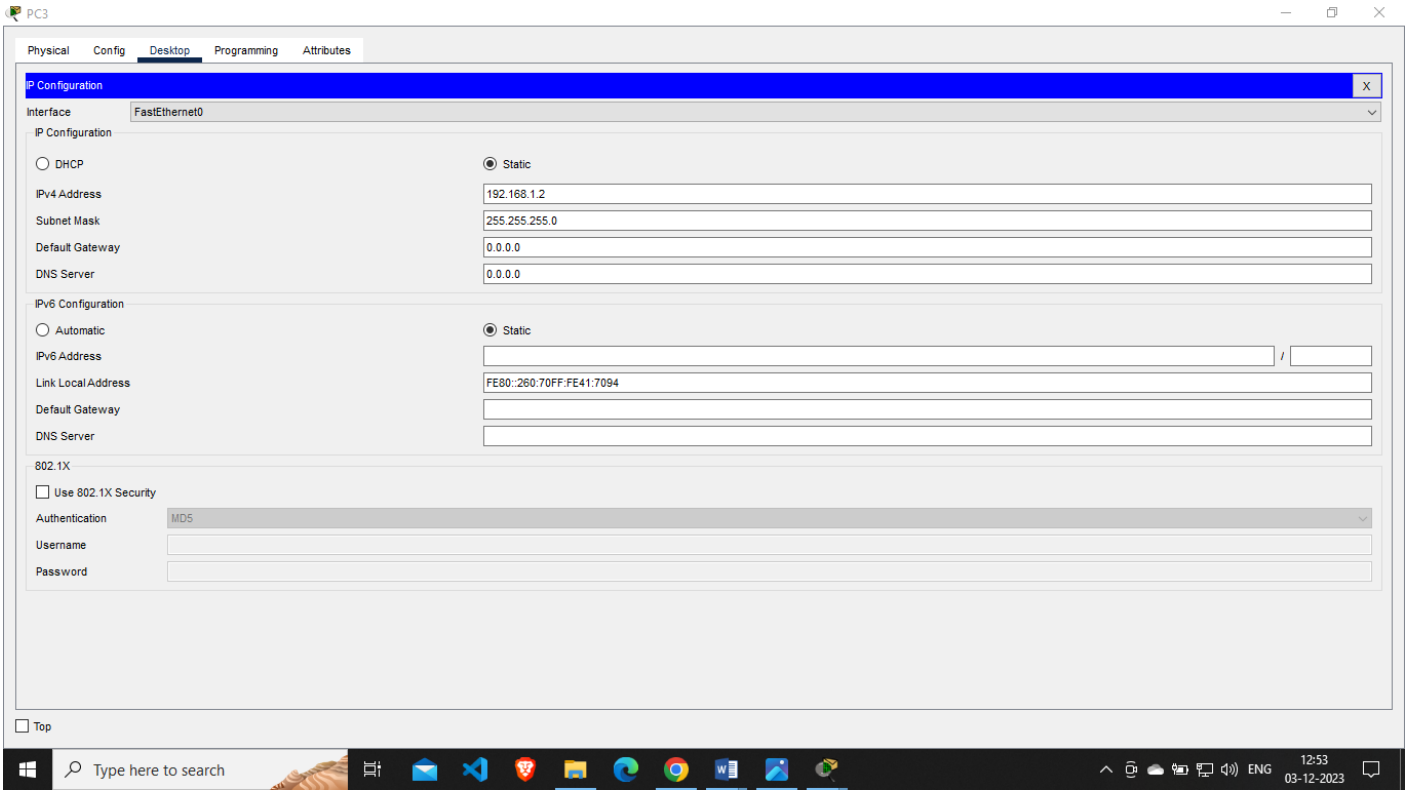



2. Configure the IP address of each PC as shown below

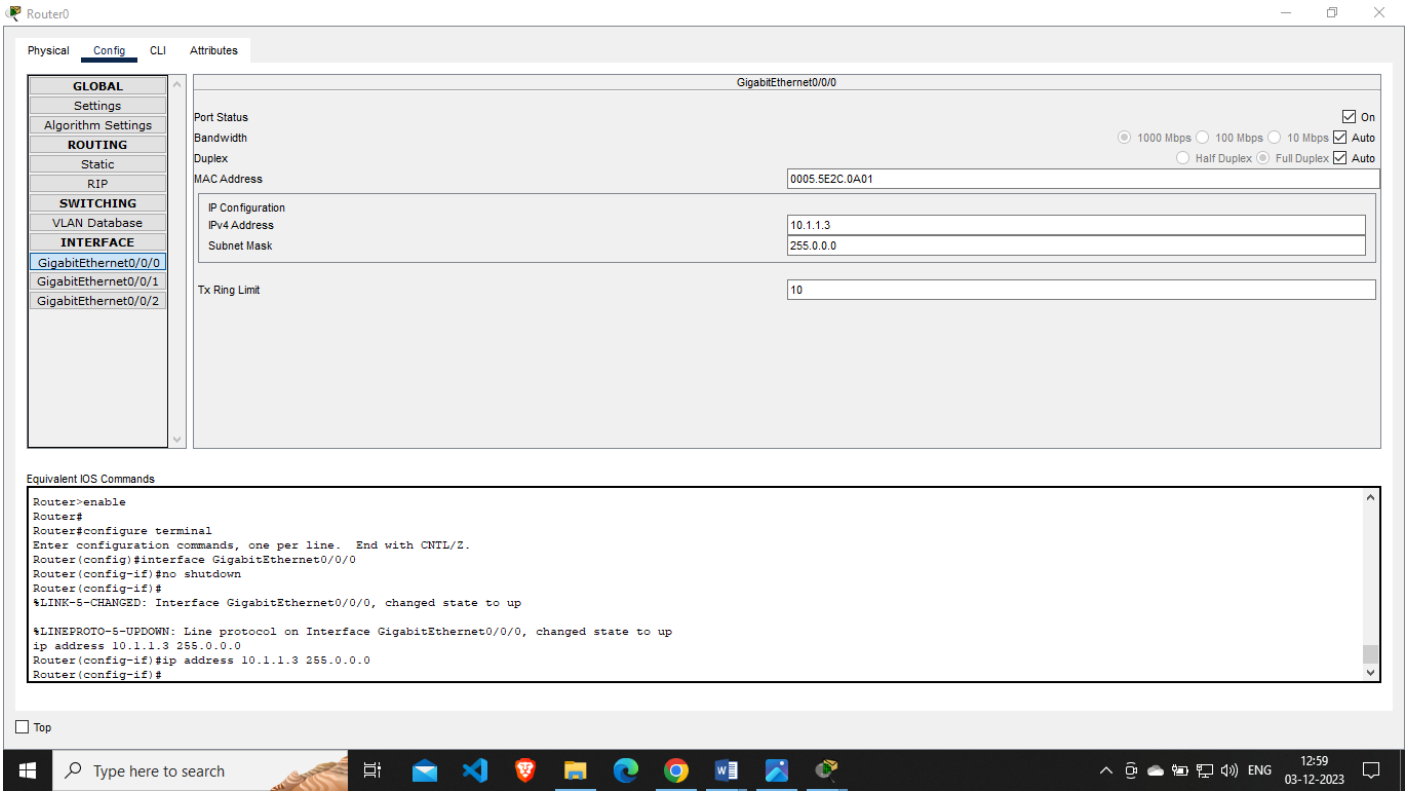


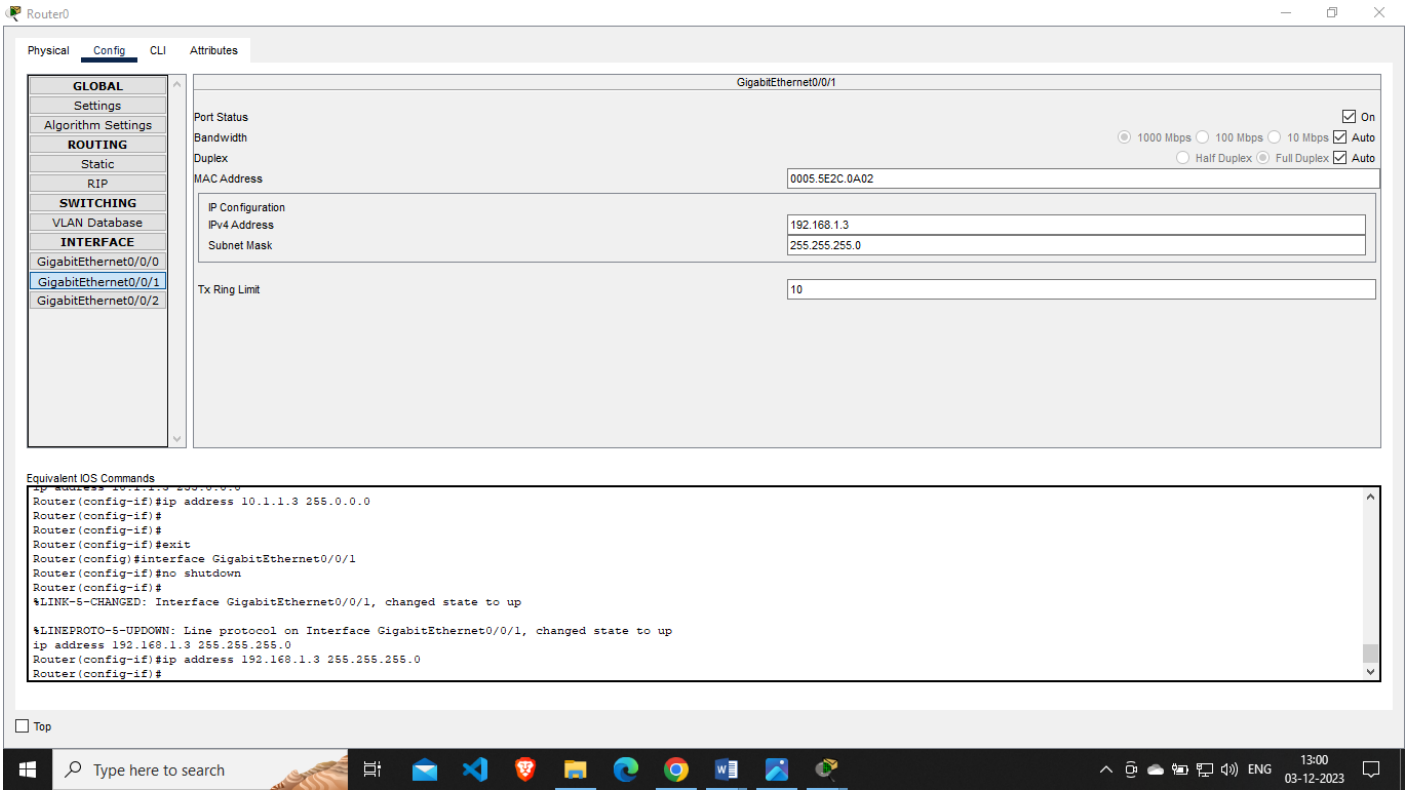

PC1
Physical
Config
Desktop
Programming
Attributes
IP Configuration
Interface
FastEthernet0
IP Configuration
DHCP
Static
IPv4 Address
10.1.1.2
Subnet Mask
255.0.0.0
Default Gateway
0.0.0.0
DNS Server
0.0.0.0
IPv6 Configuration
Automatic
Static
IPv6 Address
Link Local Address
FE80::2D0:BAFF:FE20:A372
Default Gateway
DNS Server
802.1X
Use 802.1X Security
Authentication
MD5
Username
Password
Top
Type here to search
ENG
12:52
03-12-2023

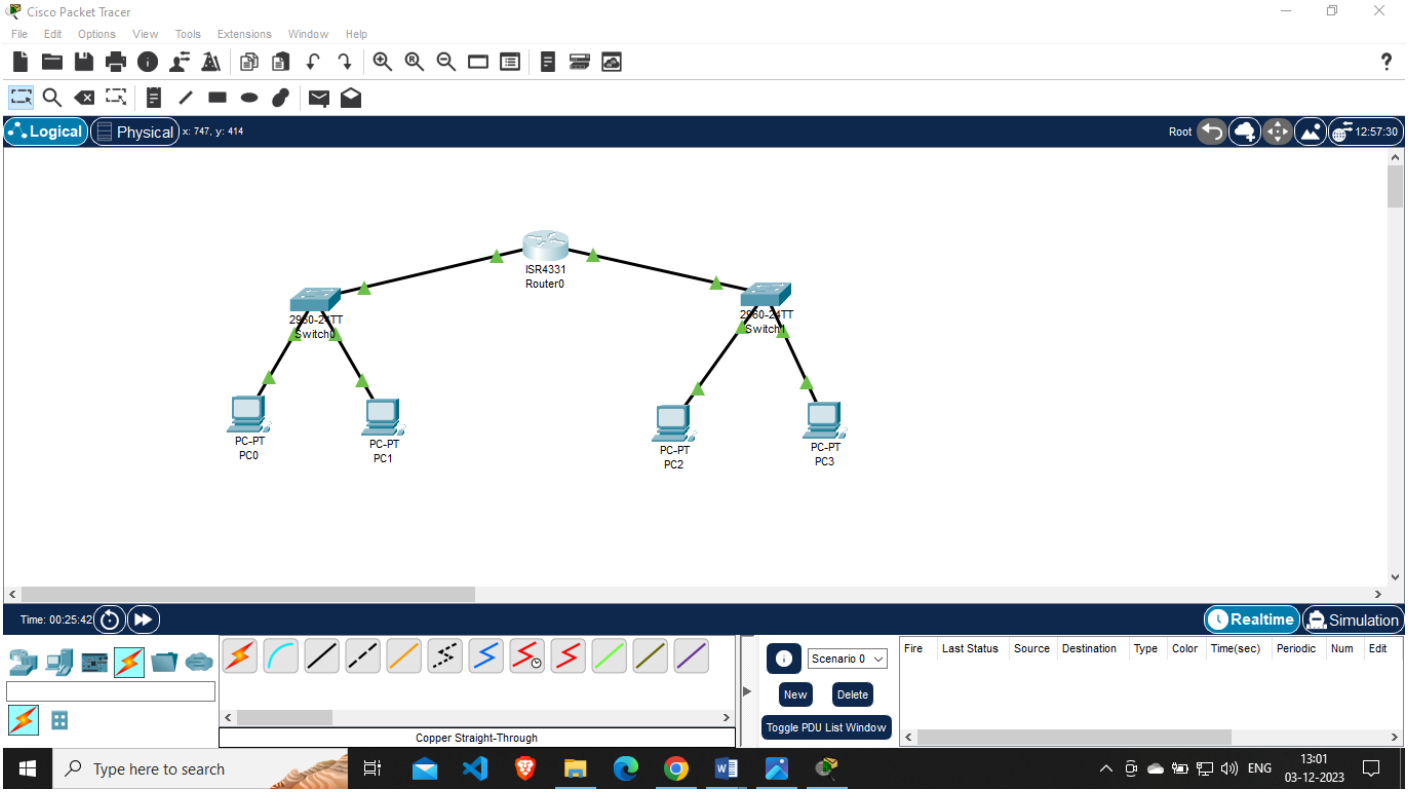

PC2
Physical
Config
Desktop
Programming
Attributes
IP Configuration
Interface
FastEthernet0
IP Configuration
DHCP
Static
IPv4 Address
192.168.1.1
Subnet Mask
255.255.255.0
Default Gateway
0.0.0.0
DNS Server
0.0.0.0
IPv6 Configuration
Automatic
Static
IPv6 Address
Link Local Address
FE80::201:C9FF:FEC2:7CAE
Default Gateway
DNS Server
802.1X
Use 802.1X Security
Authentication
MD5
Username
Password
Top
Type here to search
ENG
12:52
03-12-2023



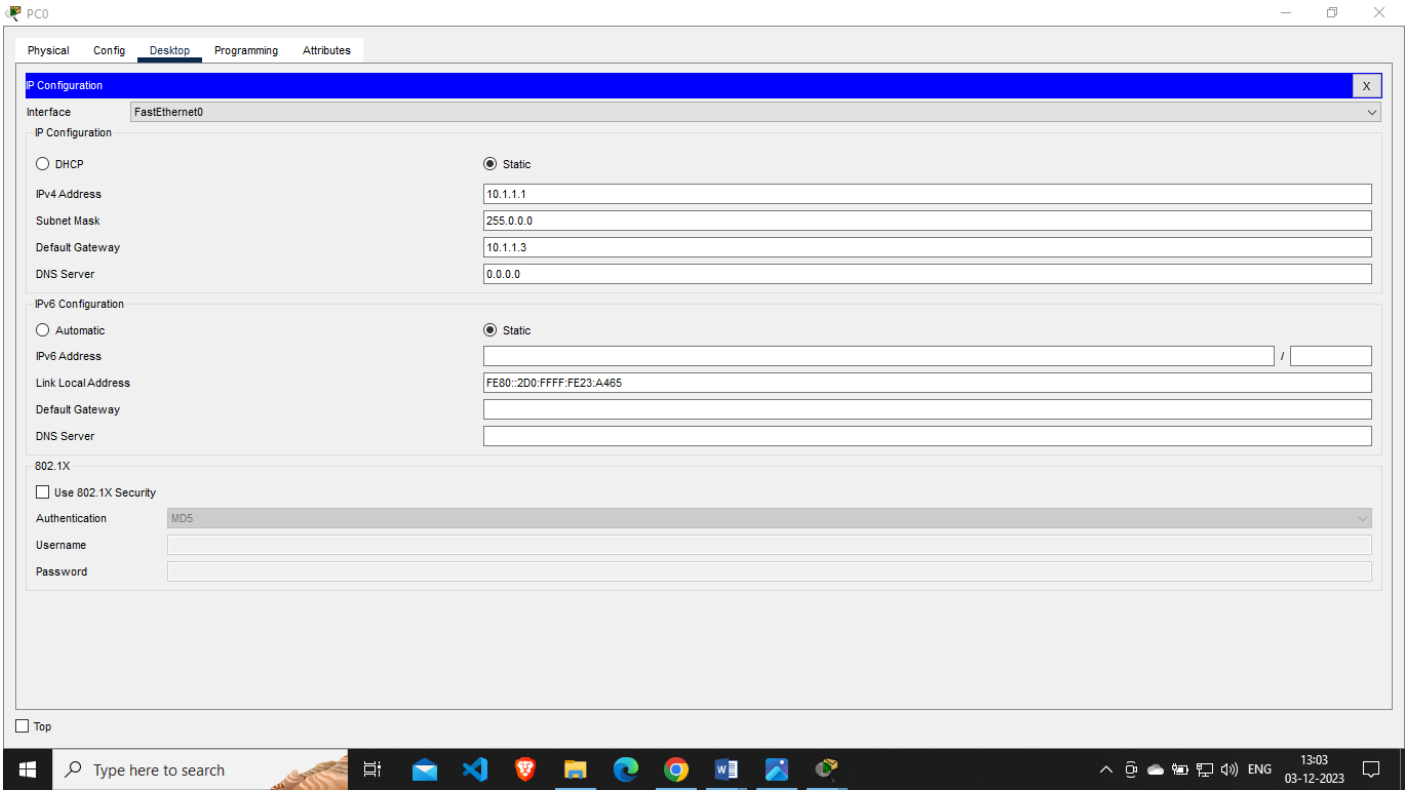

3. Configure the router as shown below

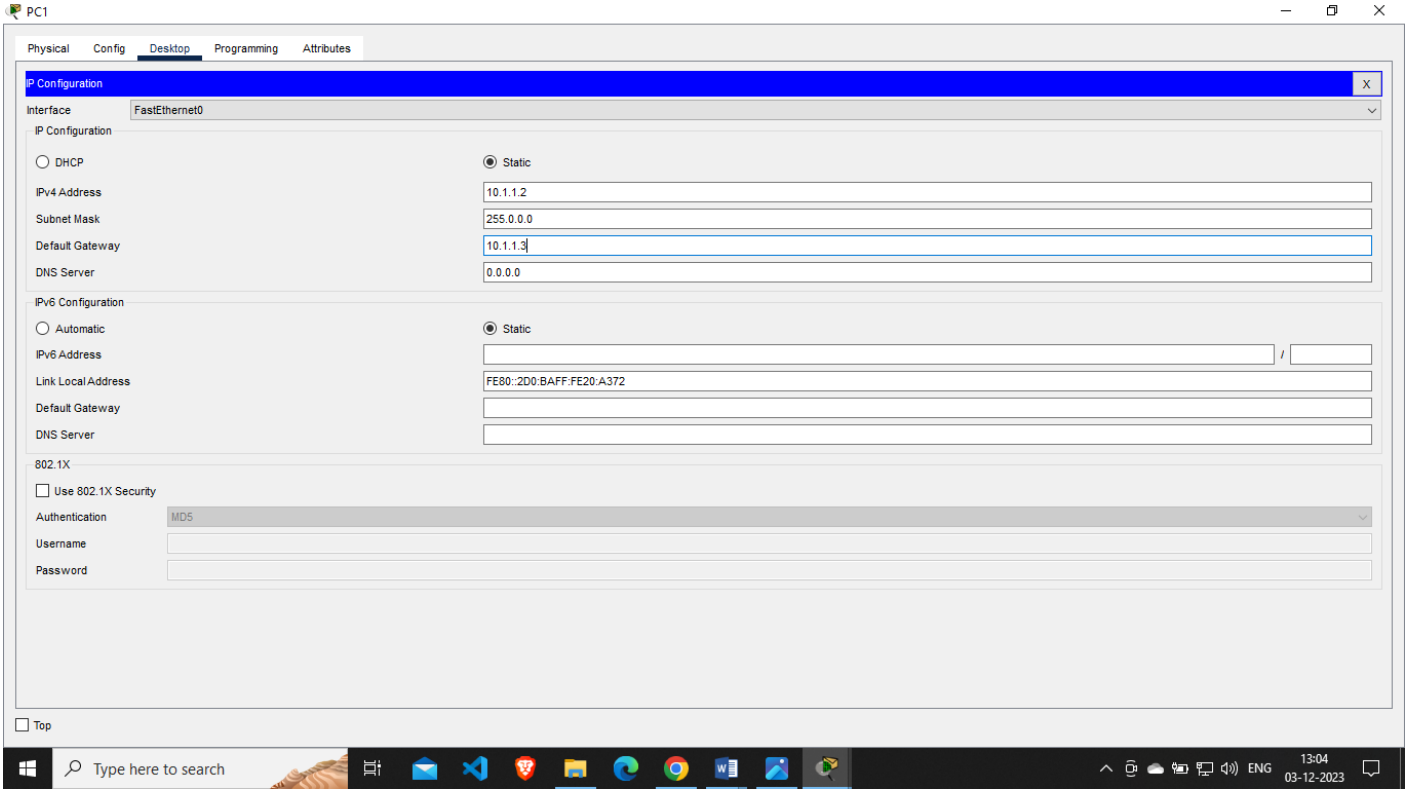


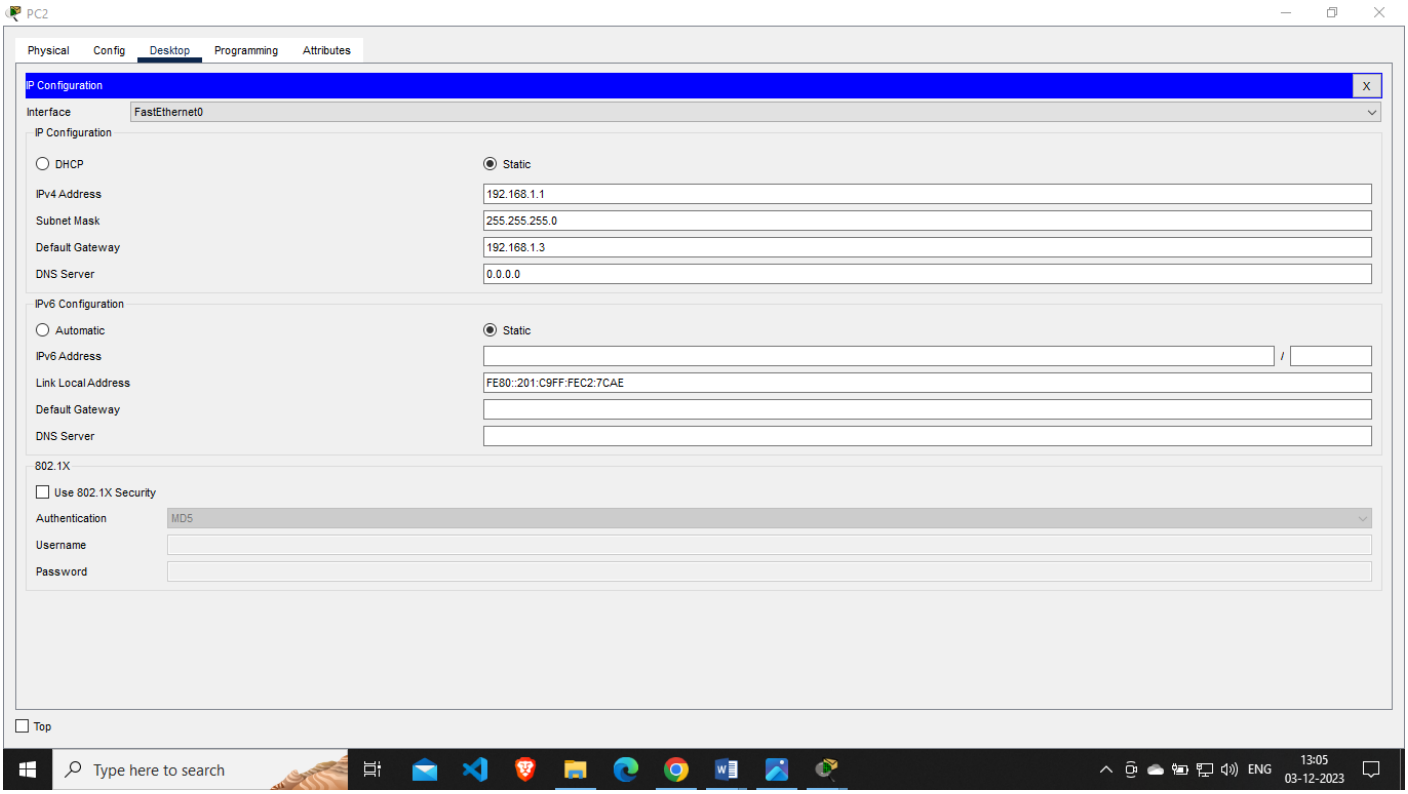


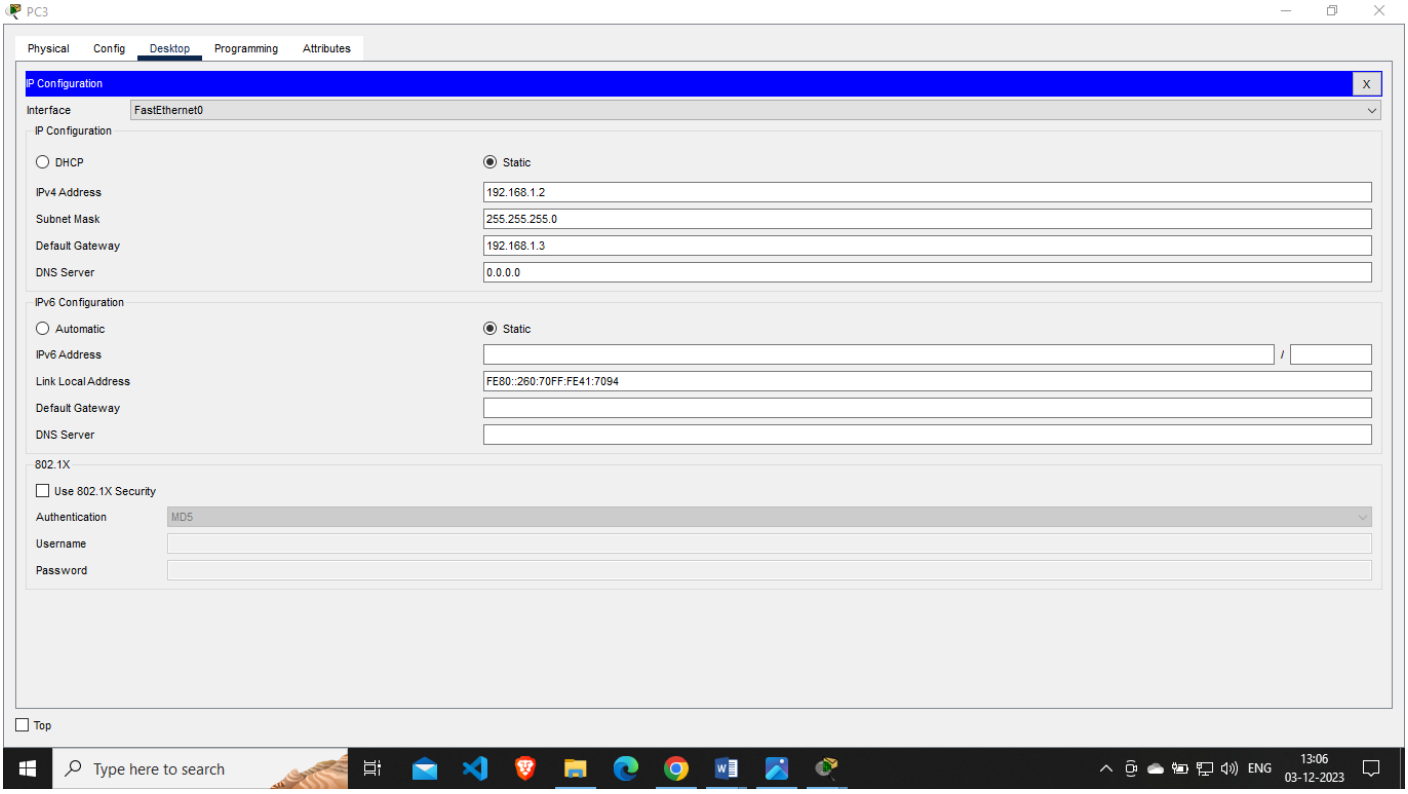




4. Change the default gateway of computers as shown below

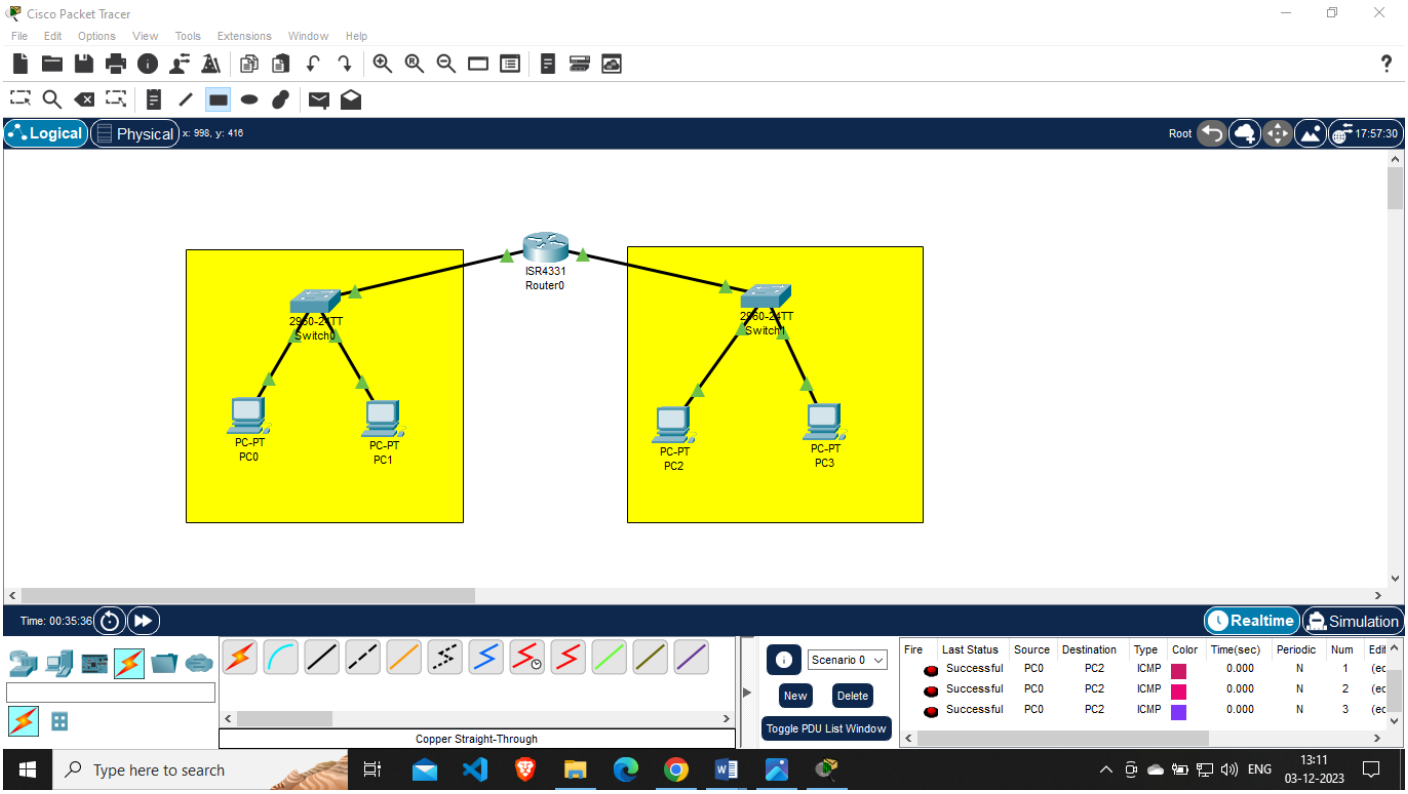

PC0
Physical
Config
Desktop
Programming
Attributes
IP Configuration
X
Interface
FastEthernet0
IP Configuration
DHCP
Static
IPv4 Address
10.1.1.1
Subnet Mask
255.0.0.0
Default Gateway
10.1.1.3
DNS Server
0.0.0.0
IPv6 Configuration
Automatic
Static
IPv6 Address
Link Local Address
FE80::2D0:FFFF:FE23:A465
Default Gateway
DNS Server
802.1X
Use 802.1X Security
Authentication
MD5
Username
Password
Top
Type here to search
ENG
13:03
03-12-2023


PC1
Physical
Config
Desktop
Programming
Attributes
IP Configuration
X
Interface
FastEthernet0
IP Configuration
DHCP
Static
IPv4 Address
10.1.1.2
Subnet Mask
255.0.0.0
Default Gateway
10.1.1.3
DNS Server
0.0.0.0
IPv6 Configuration
Automatic
Static
IPv6 Address
Link Local Address
FE80::2D0:BAFF:FE20:A372
Default Gateway
DNS Server
802.1X
Use 802.1X Security
Authentication
MD5
Username
Password
Top
Type here to search
ENG
13:04
03-12-2023




5. Send message from PC0 to PC2 i.e. network 1 to network 2

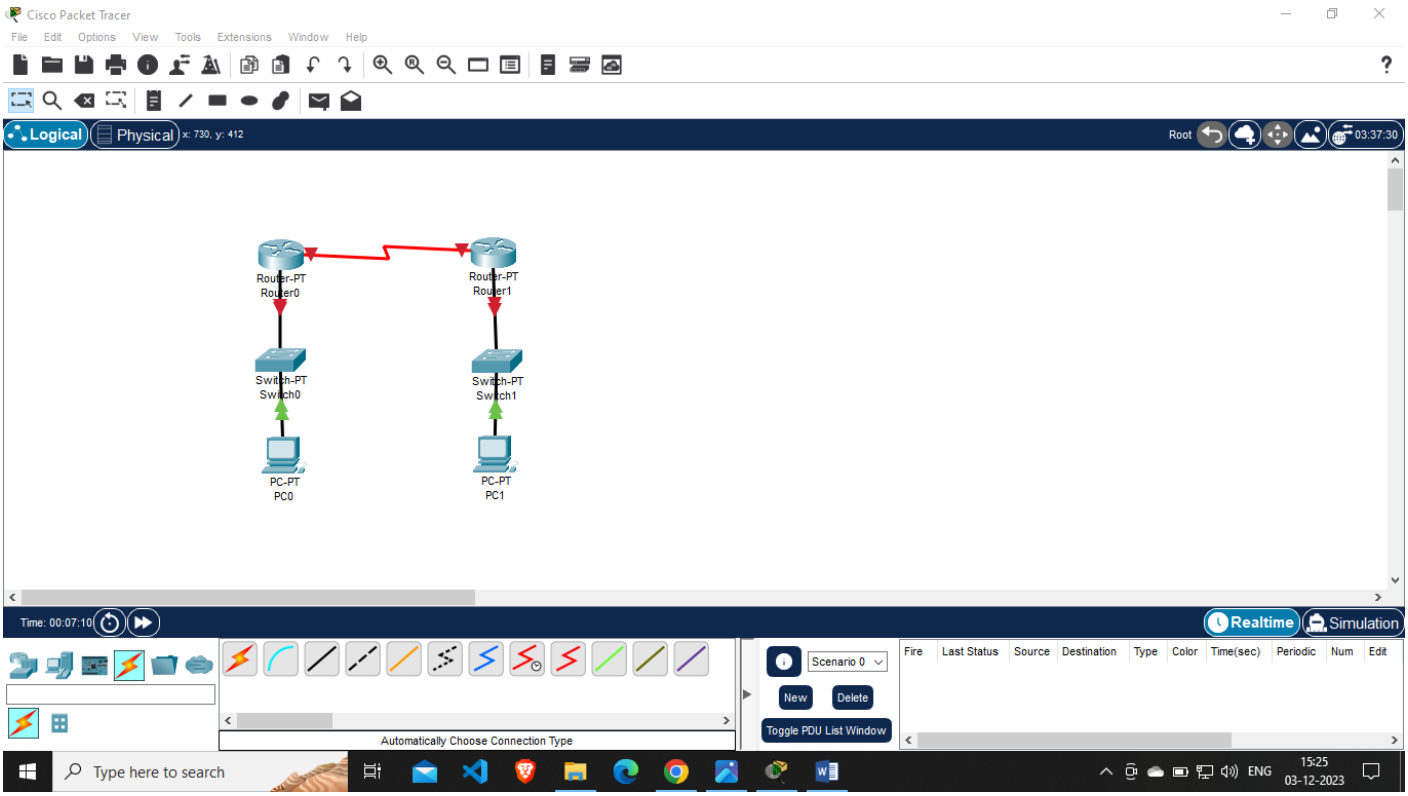

Cisco Packet Tracer
File Edit Options View Tools Extensions Window Help
Logical
Physical
x: 998, y: 416
Root
17:57:30
ISR4331
Router0
2960-24TT
Switch0
2960-24TT
Switch1
PC-PT
PC0
PC-PT
PC1
PC-PT
PC2
PC-PT
PC3
Time: 00:35:36
Realtime
Simulation
Copper Straight-Through
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Successful PC0 PC2 ICMP 0.000 N 1
Successful PC0 PC2 ICMP 0.000 N 2
Successful PC0 PC2 ICMP 0.000 N 3
Type here to search
ENG
13:11
03-12-2023

# Program No. 8

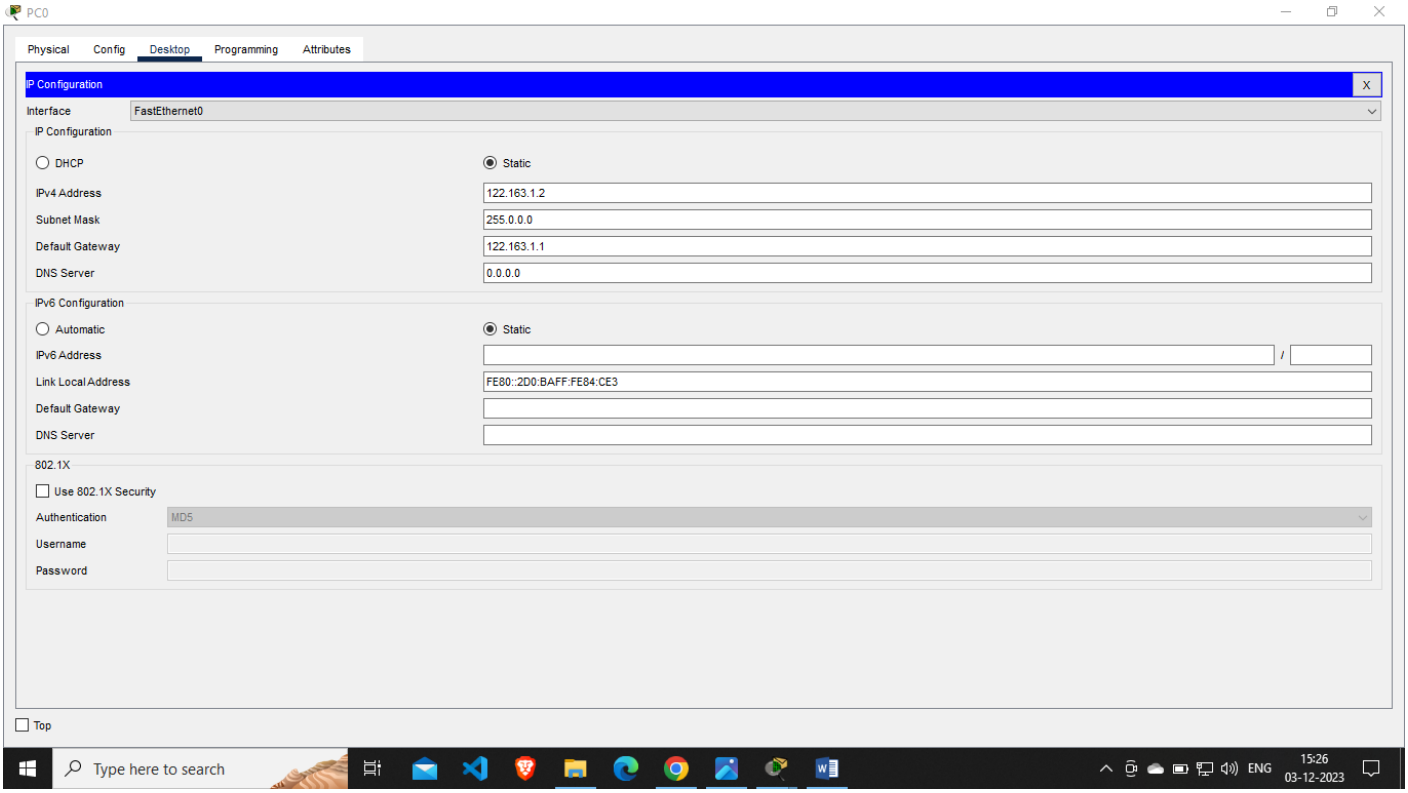
# To connect two networks and implement RIP using cisco packet tracer

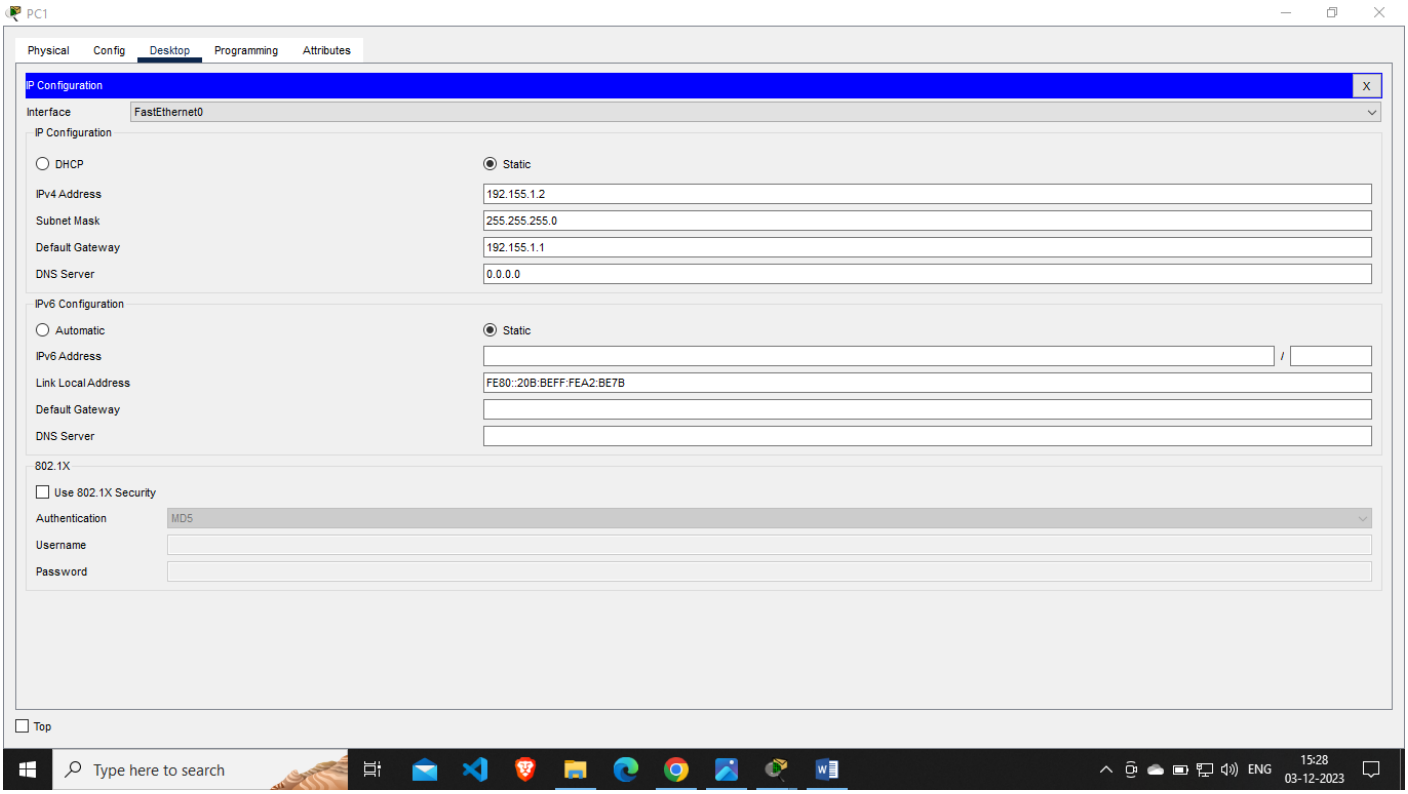
Steps:

1. Make the connections as shown below

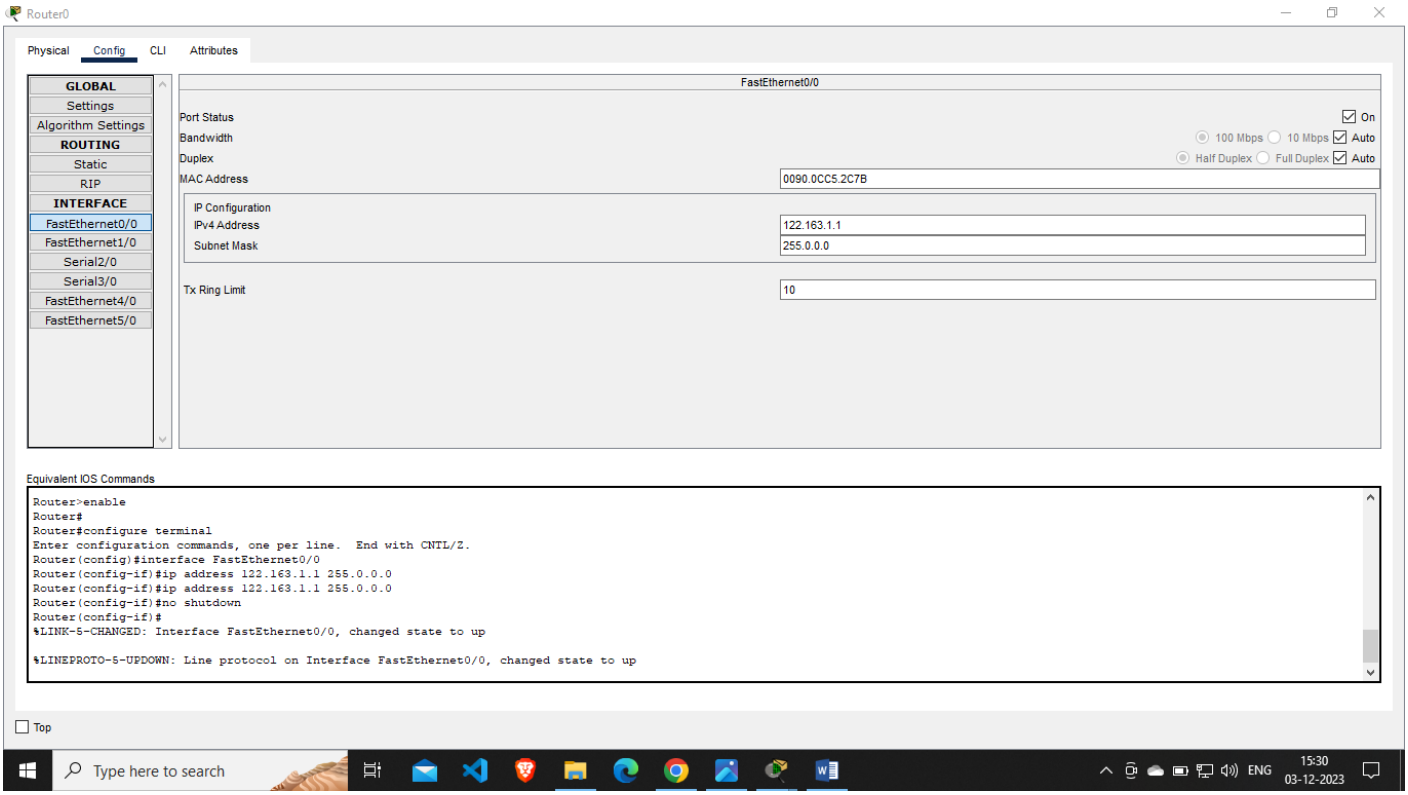


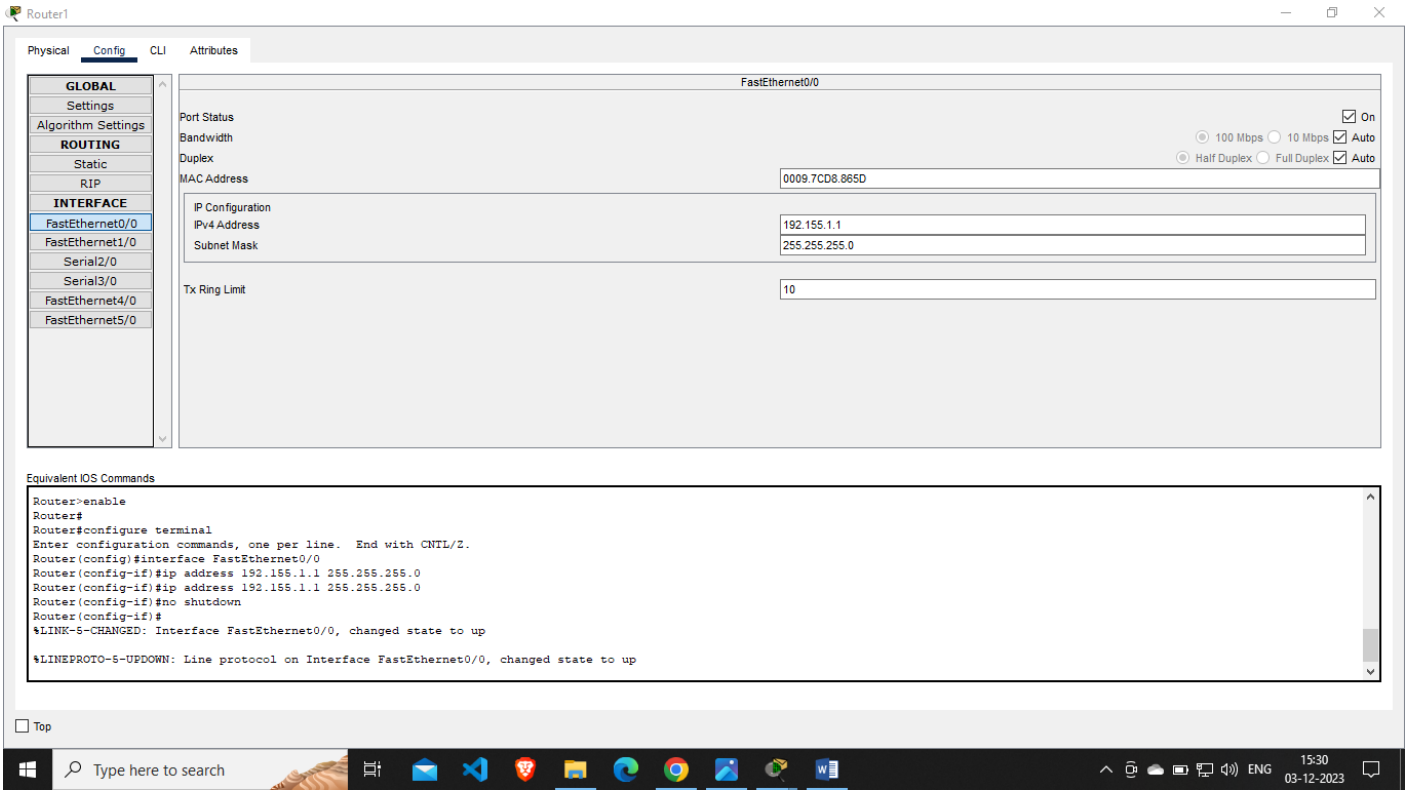

2. Configure the 2 PC as shown below



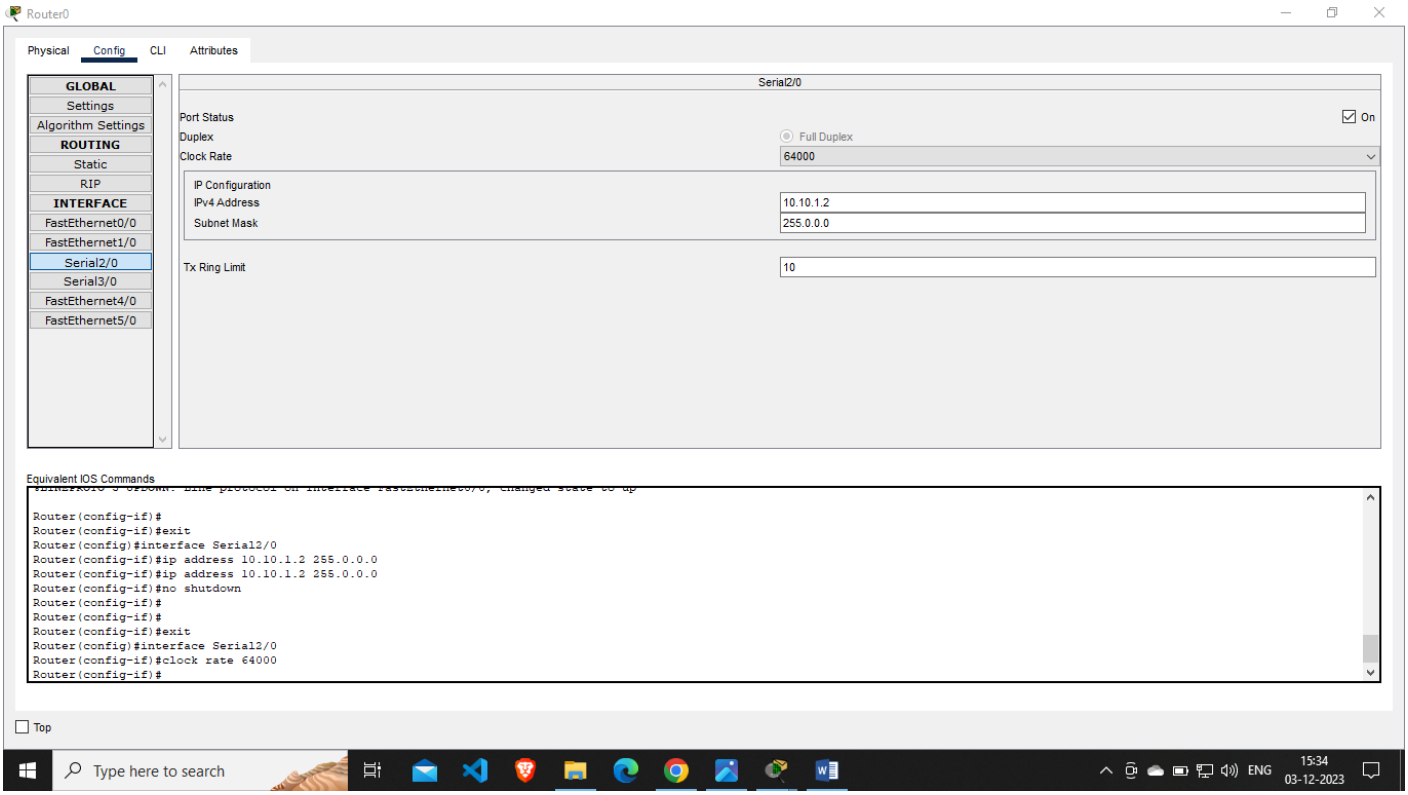



3. Configure the routers as shown below

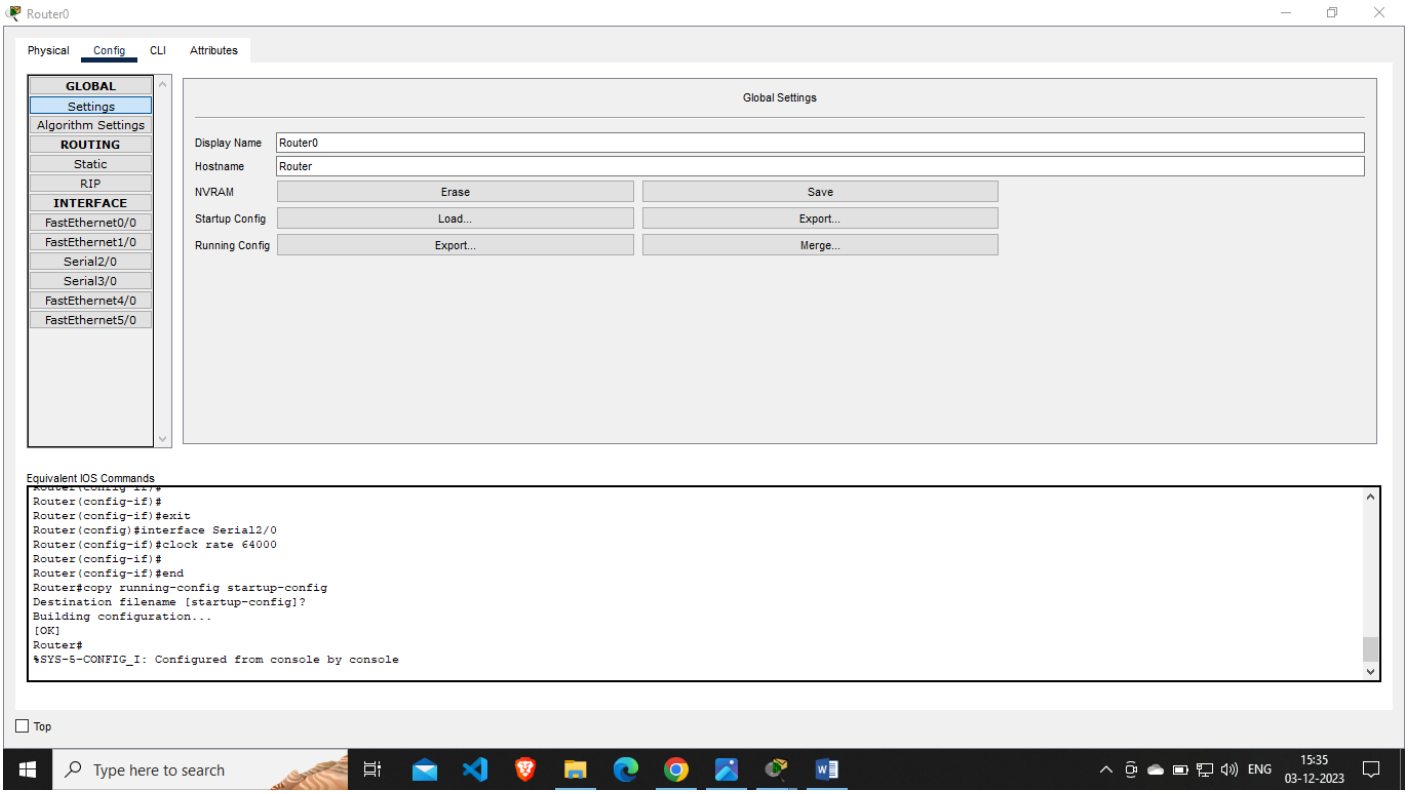




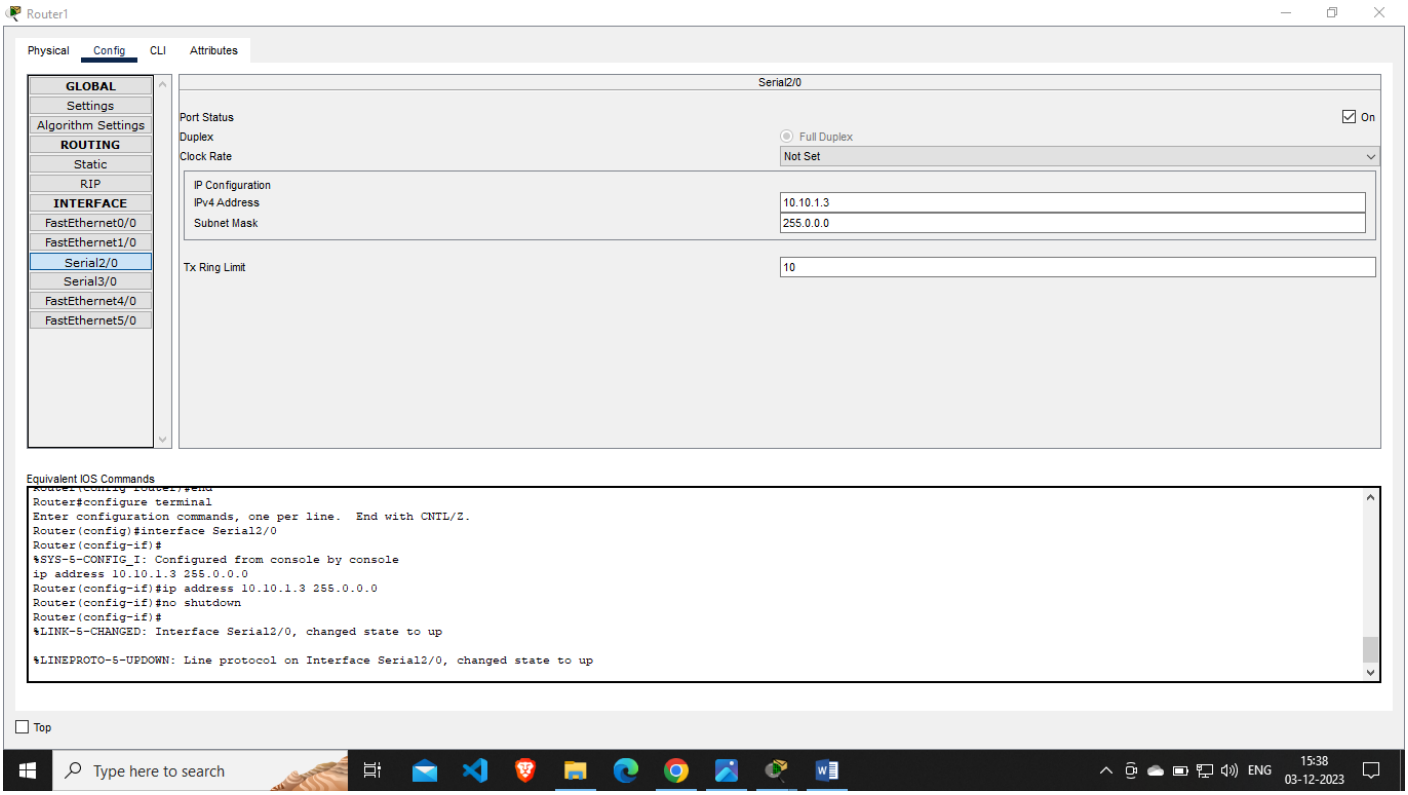

4. Configure the Router0 as shown below



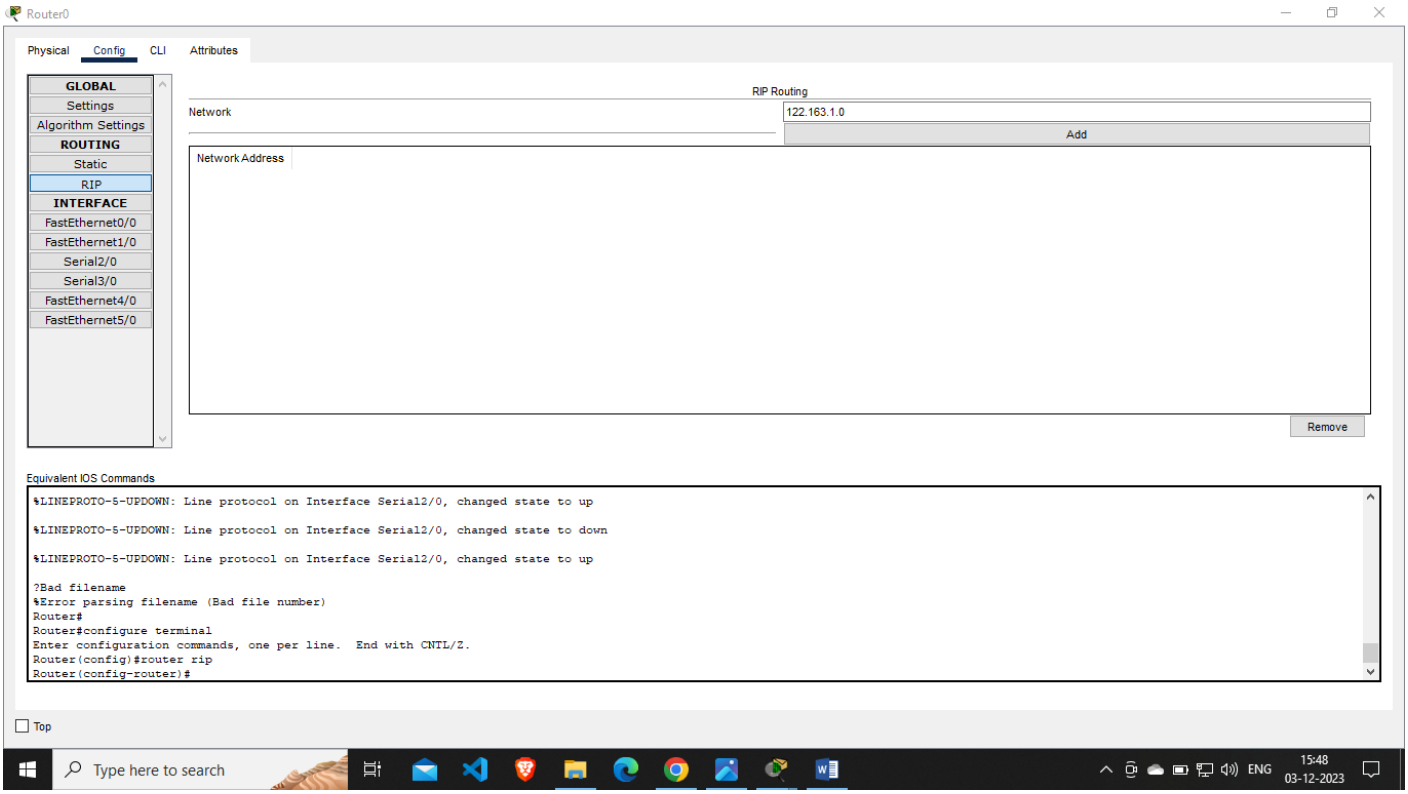

5. Go to settings and save it as NVRAM

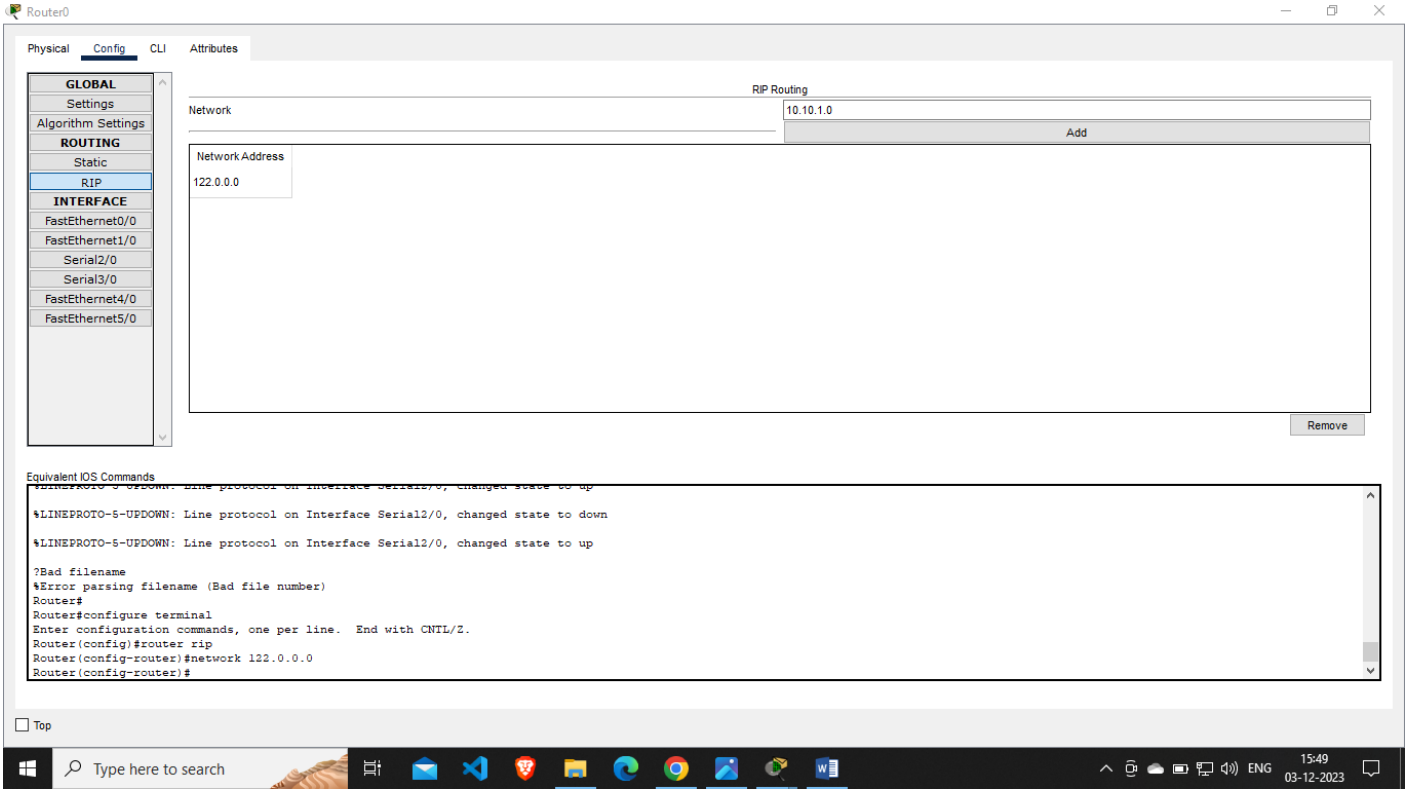


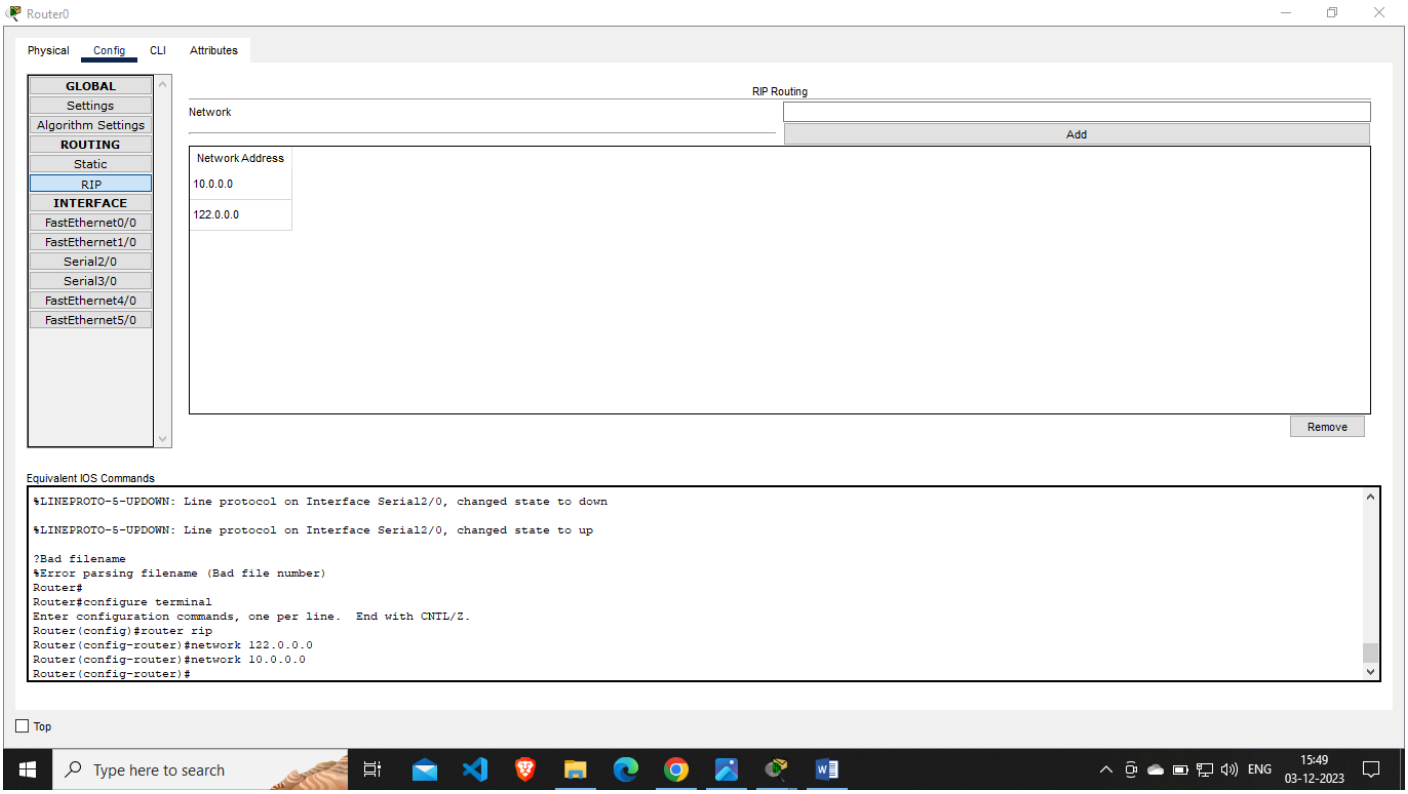

6. Configure Router1 as shown below

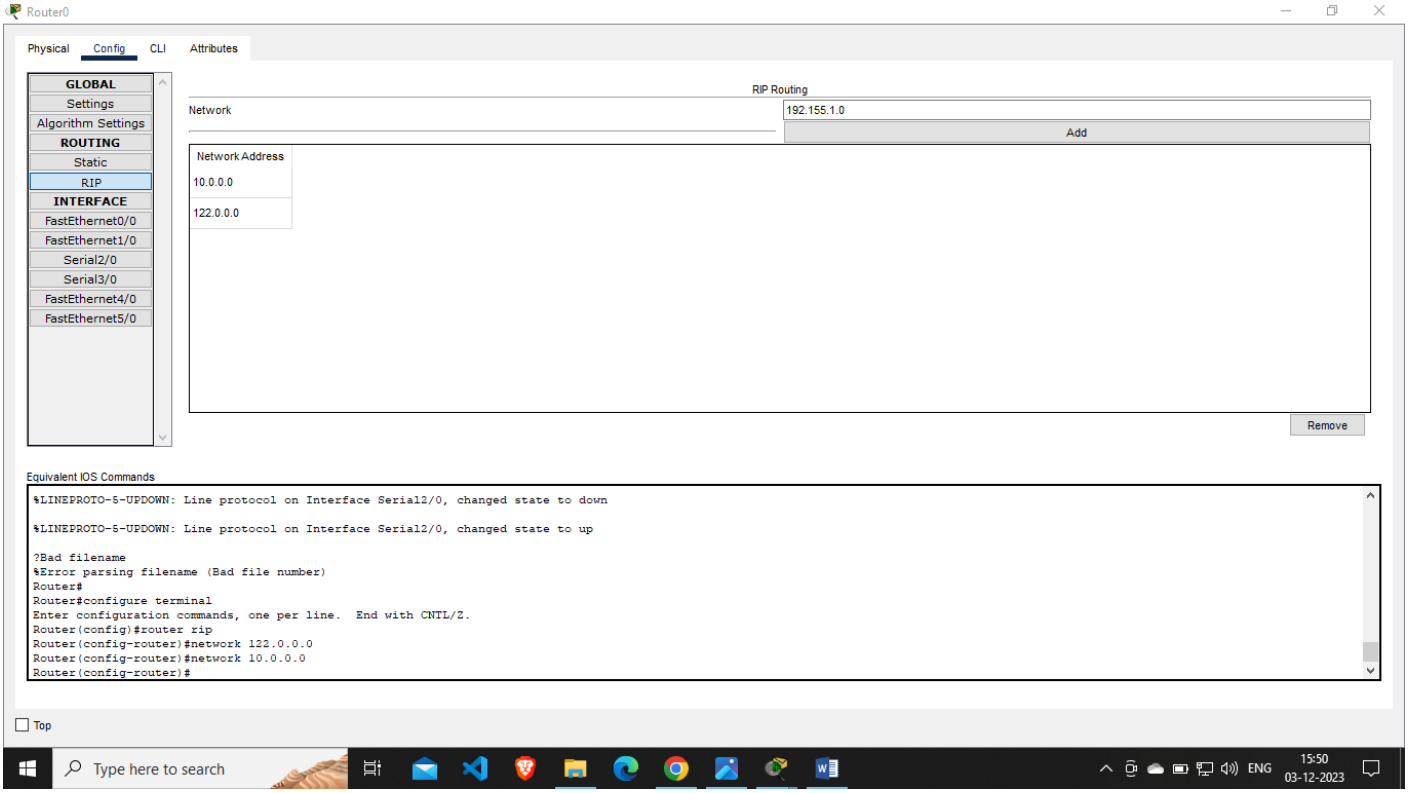



7. Configure Router0 as shown below then click add

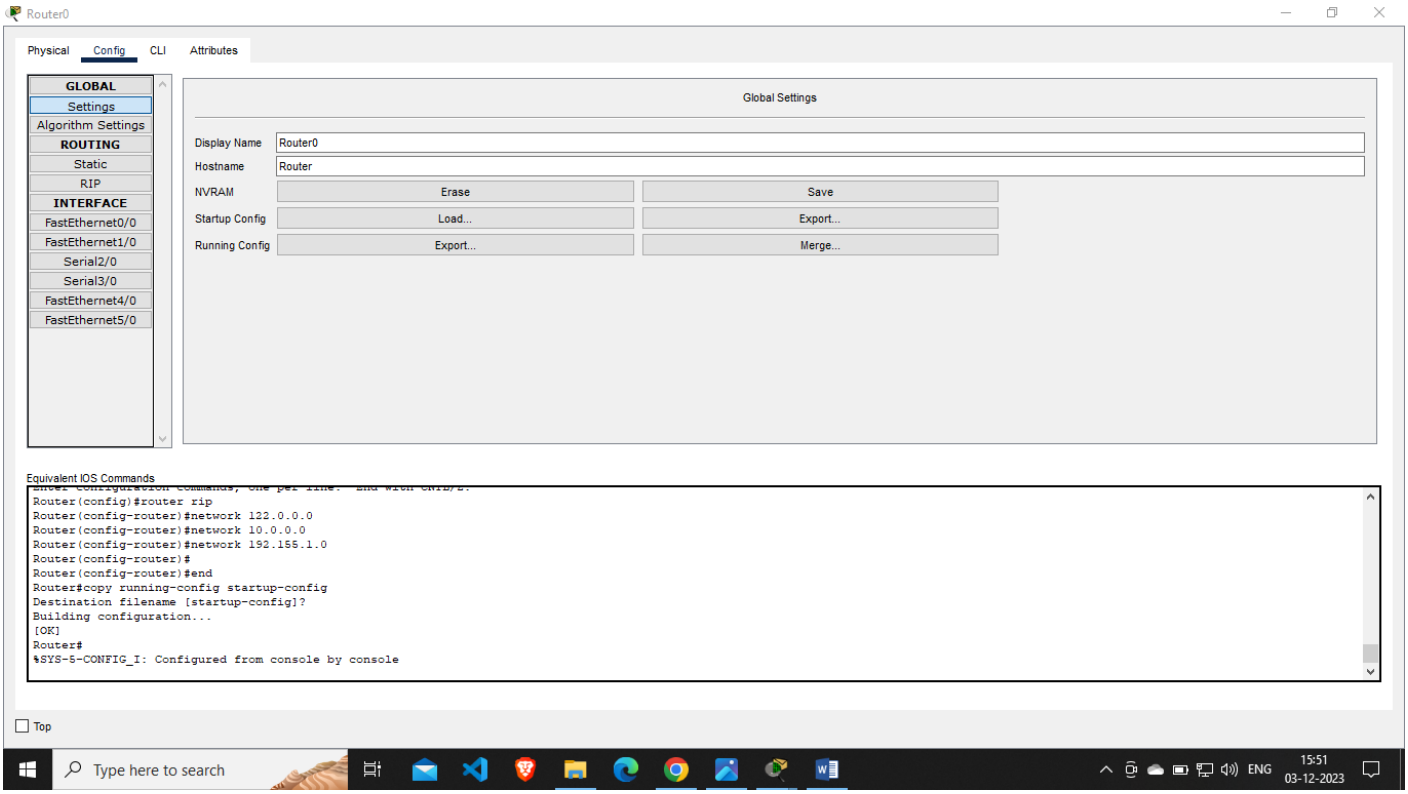

Router0
Physical
Config
CLI
Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
INTERFACE
FastEthernet0/0
FastEthernet1/0
Serial2/0
Serial3/0
FastEthernet4/0
FastEthernet5/0
RIP Routing
Network
122.163.1.0
Add
Network Address
Remove
Equivalent IOS Commands
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
?Bad filename
%Error parsing filename (Bad file number)
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router rip
Router(config-router)#
Top
Type here to search
ENG
15:48
03-12-2023


Router0
Physical
Config
CLI
Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
INTERFACE
FastEthernet0/0
FastEthernet1/0
Serial2/0
Serial3/0
FastEthernet4/0
FastEthernet5/0
RIP Routing
Network
10.10.1.0
Add
Network Address
122.0.0.0
Remove
Equivalent IOS Commands
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
?Bad filename
%Error parsing filename (Bad file number)
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router rip
Router(config-router)#network 122.0.0.0
Router(config-router)#
Top
Type here to search
ENG
15:49
03-12-2023

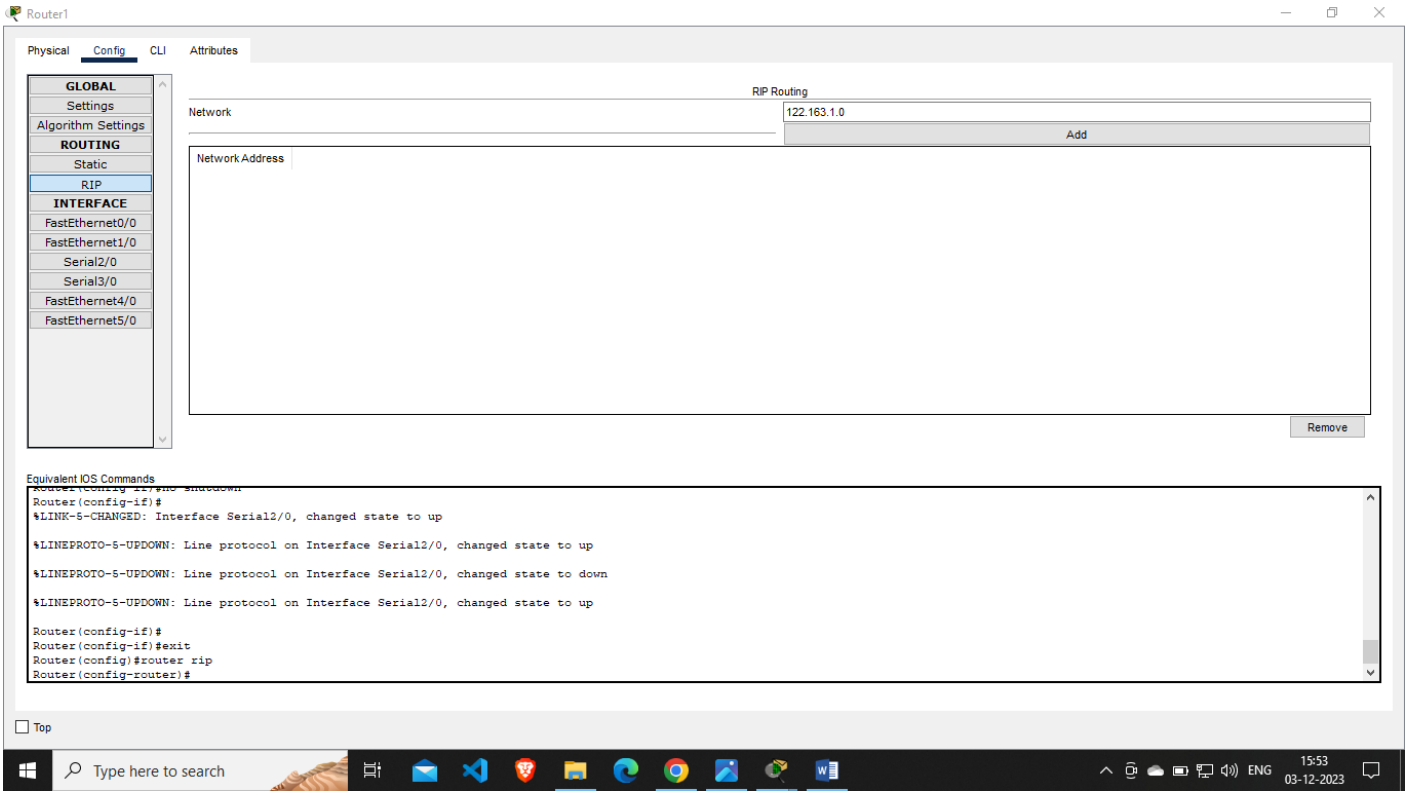


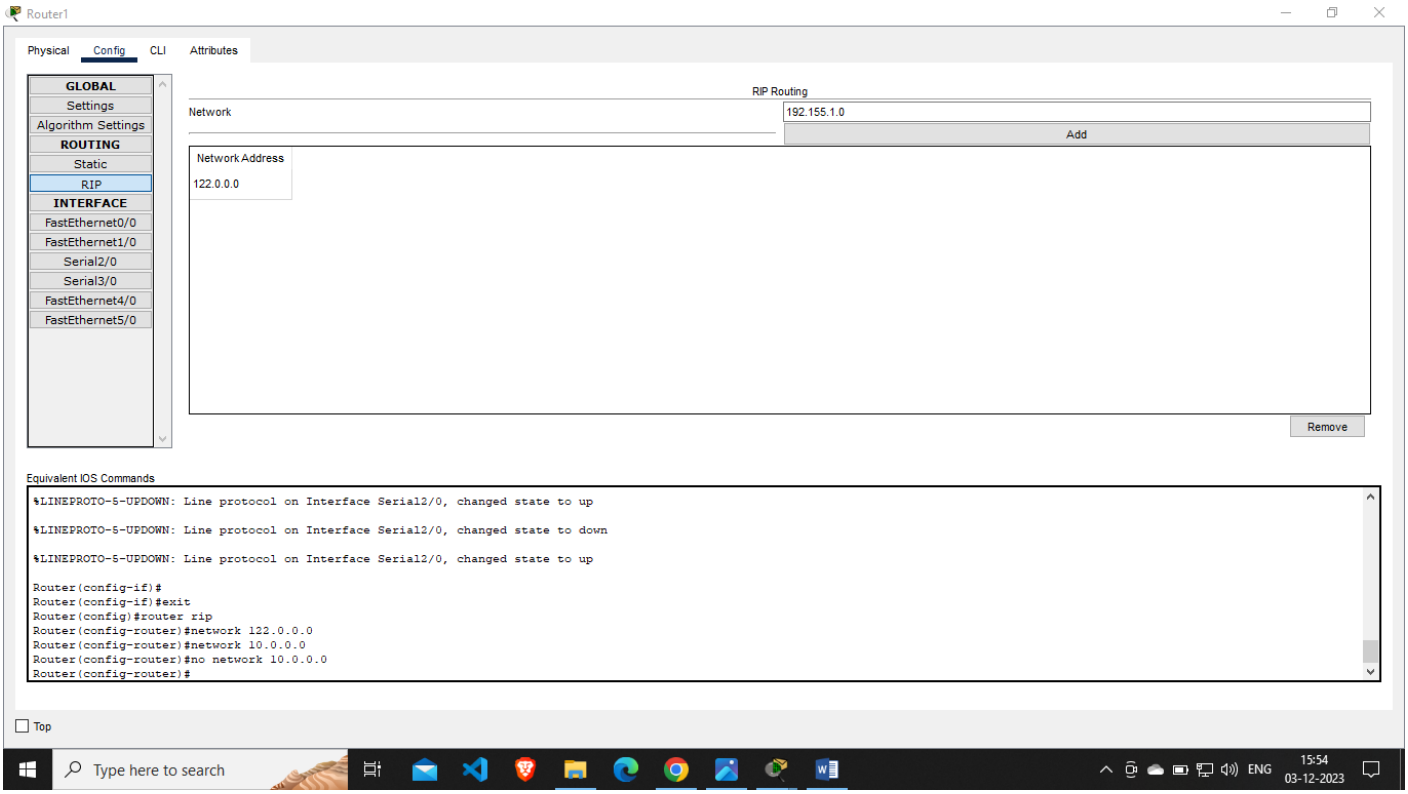



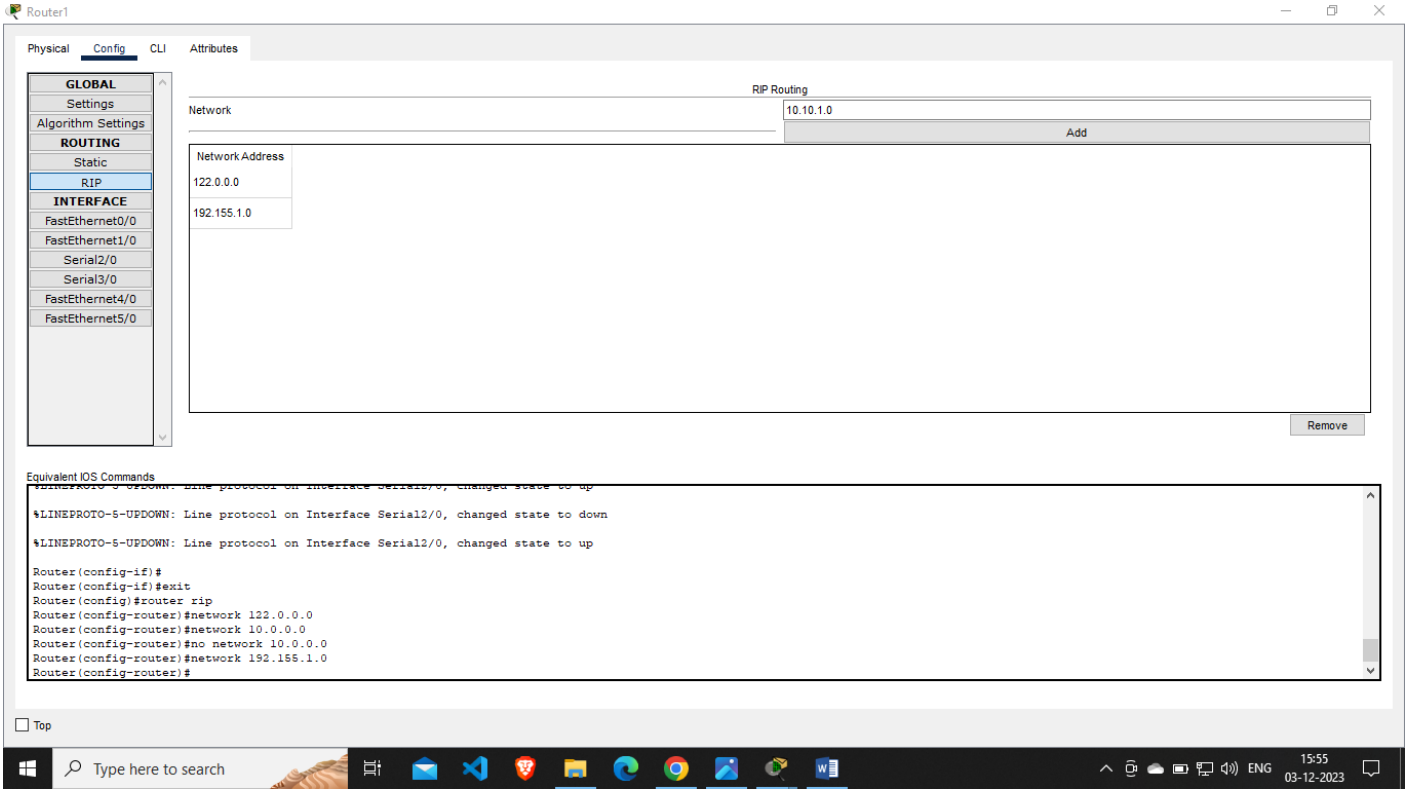

8. Go to settings, save this as NVRAM

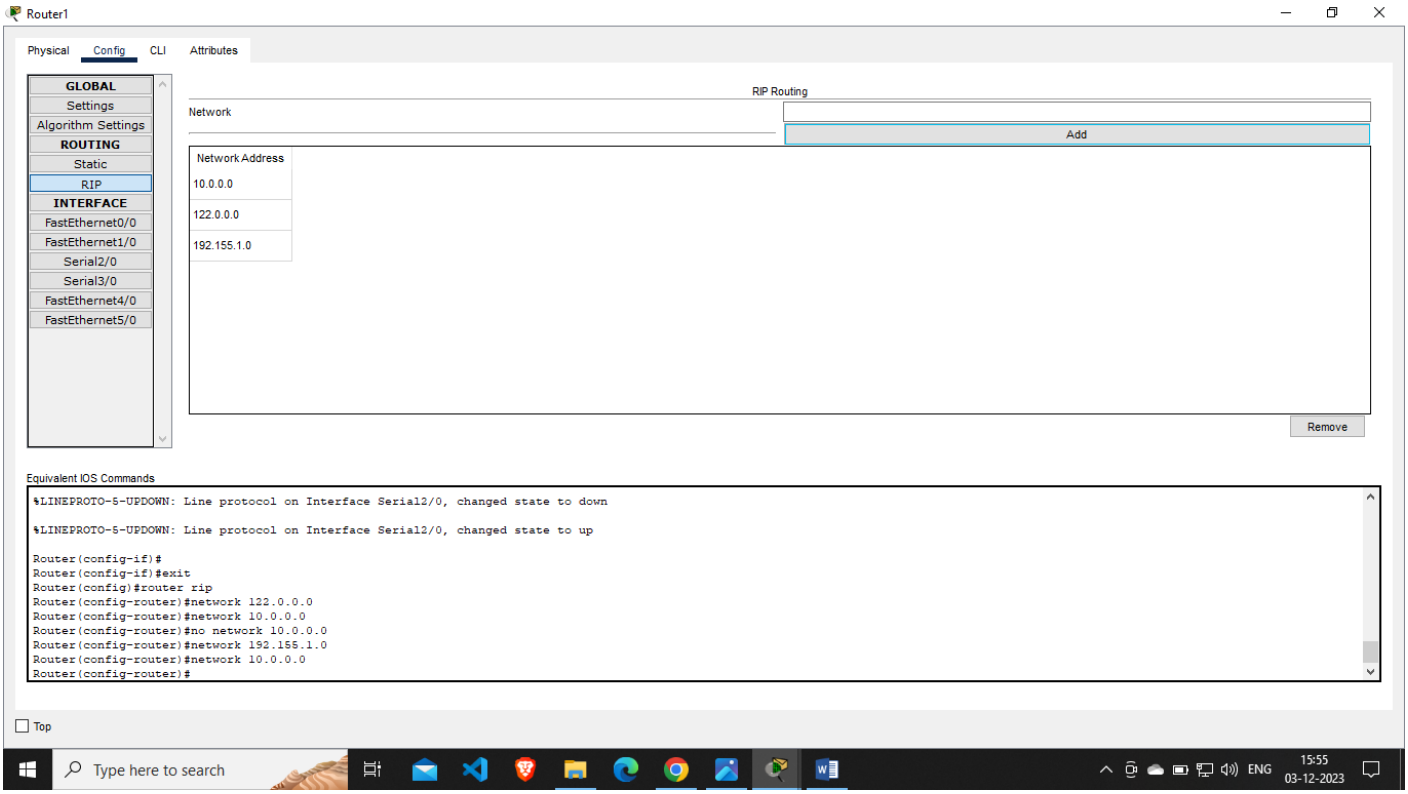



9. Configure Router1 as shown below

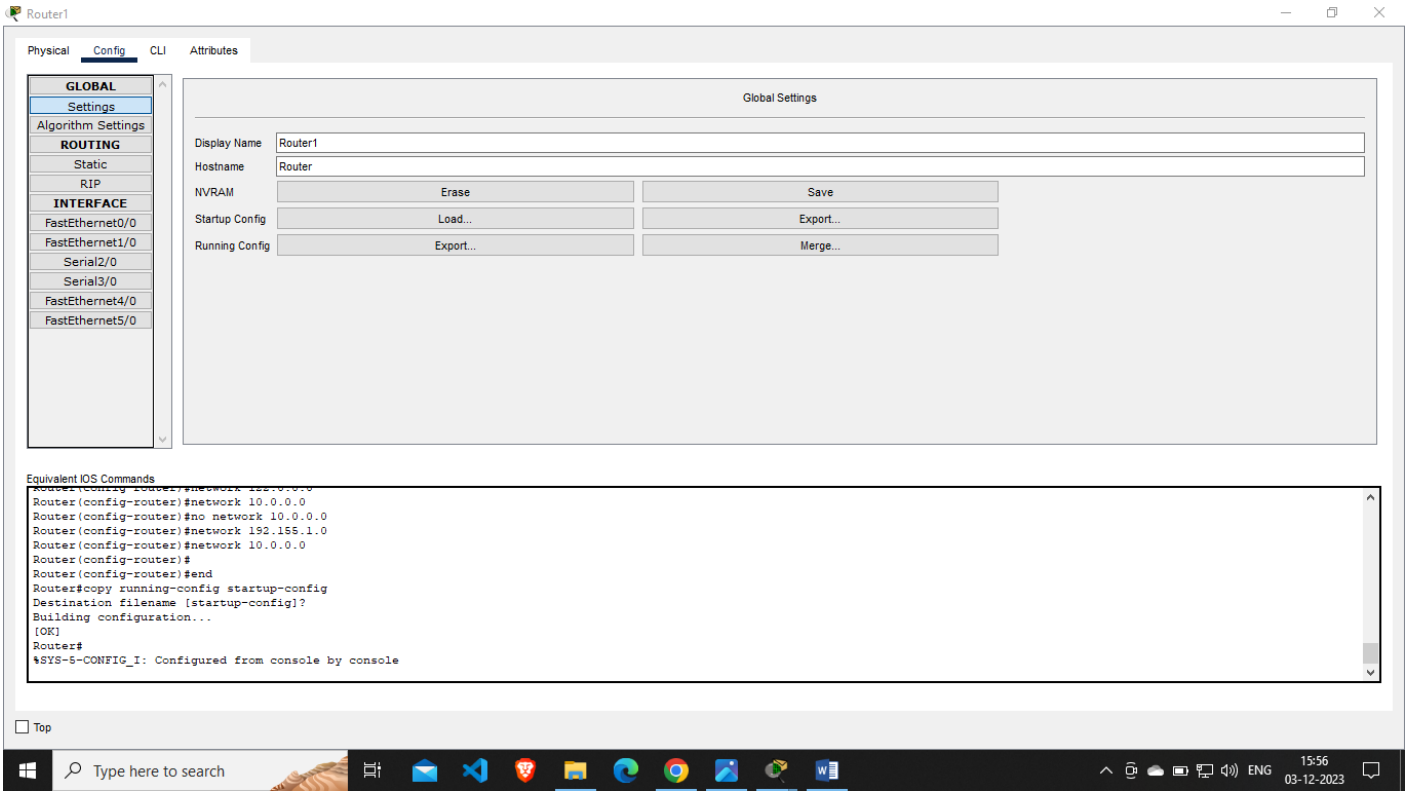


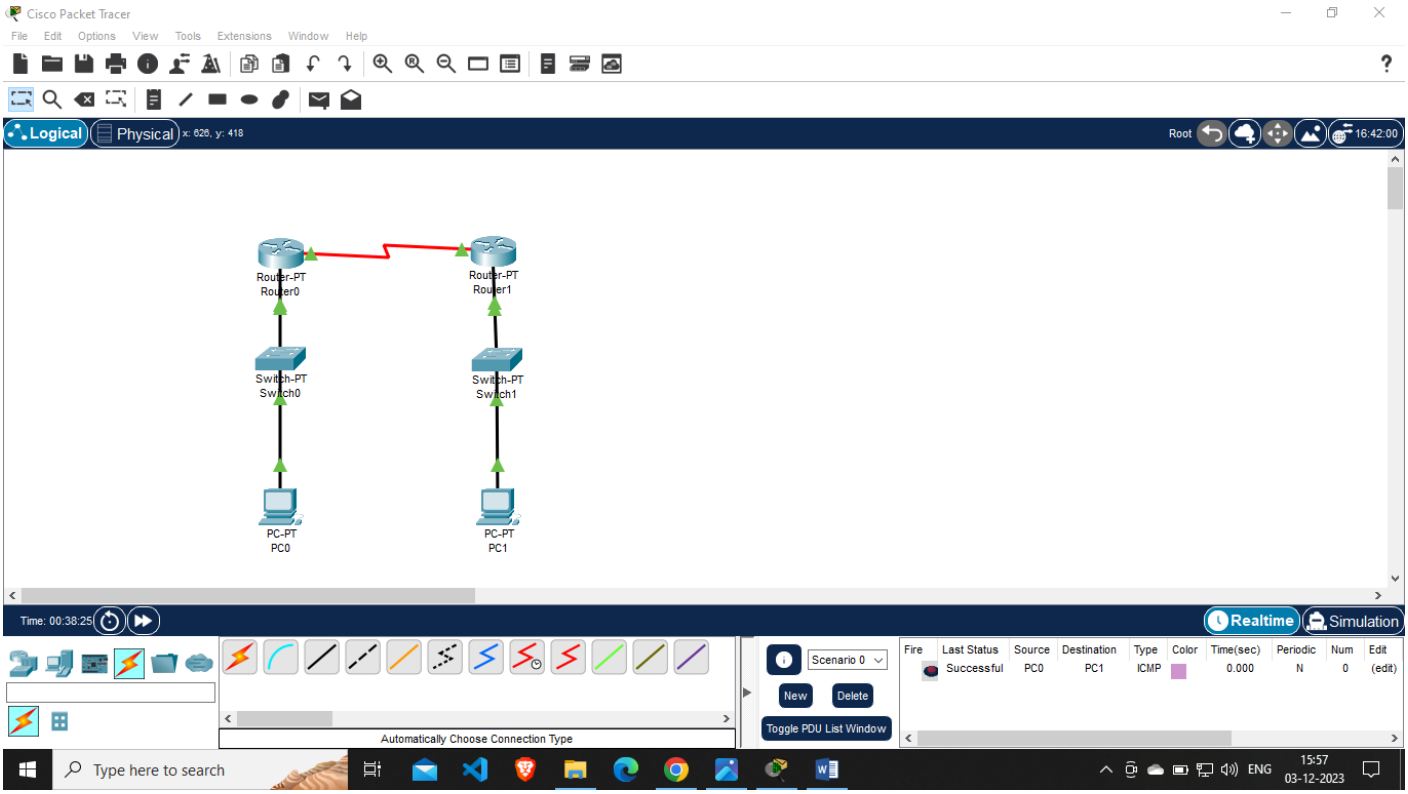

Router1
Physical
Config
CLI
Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
INTERFACE
FastEthernet0/0
FastEthernet1/0
Serial2/0
Serial3/0
FastEthernet4/0
FastEthernet5/0
RIP Routing
Network
192.155.1.0
Add
Network Address
122.0.0.0
Remove
Equivalent IOS Commands
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
Router(config-if)#
Router(config-if)#exit
Router(config)#router rip
Router(config-router)#network 122.0.0.0
Router(config-router)#network 10.0.0.0
Router(config-router)#no network 10.0.0.0
Router(config-router)#
Top
Type here to search
ENG
15:54
03-12-2023


Router1
Physical
Config
CLI
Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
INTERFACE
FastEthernet0/0
FastEthernet1/0
Serial2/0
Serial3/0
FastEthernet4/0
FastEthernet5/0
RIP Routing
Network
10.10.1.0
Add
Network Address
122.0.0.0
192.155.1.0
Remove
Equivalent IOS Commands
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
Router(config-if)#
Router(config-if)#exit
Router(config)#router rip
Router(config-router)#network 122.0.0.0
Router(config-router)#network 10.0.0.0
Router(config-router)#no network 10.0.0.0
Router(config-router)#network 192.155.1.0
Router(config-router)#
Top
Type here to search
ENG
15:55
03-12-2023




10. Go to settings and save it as NVRAM



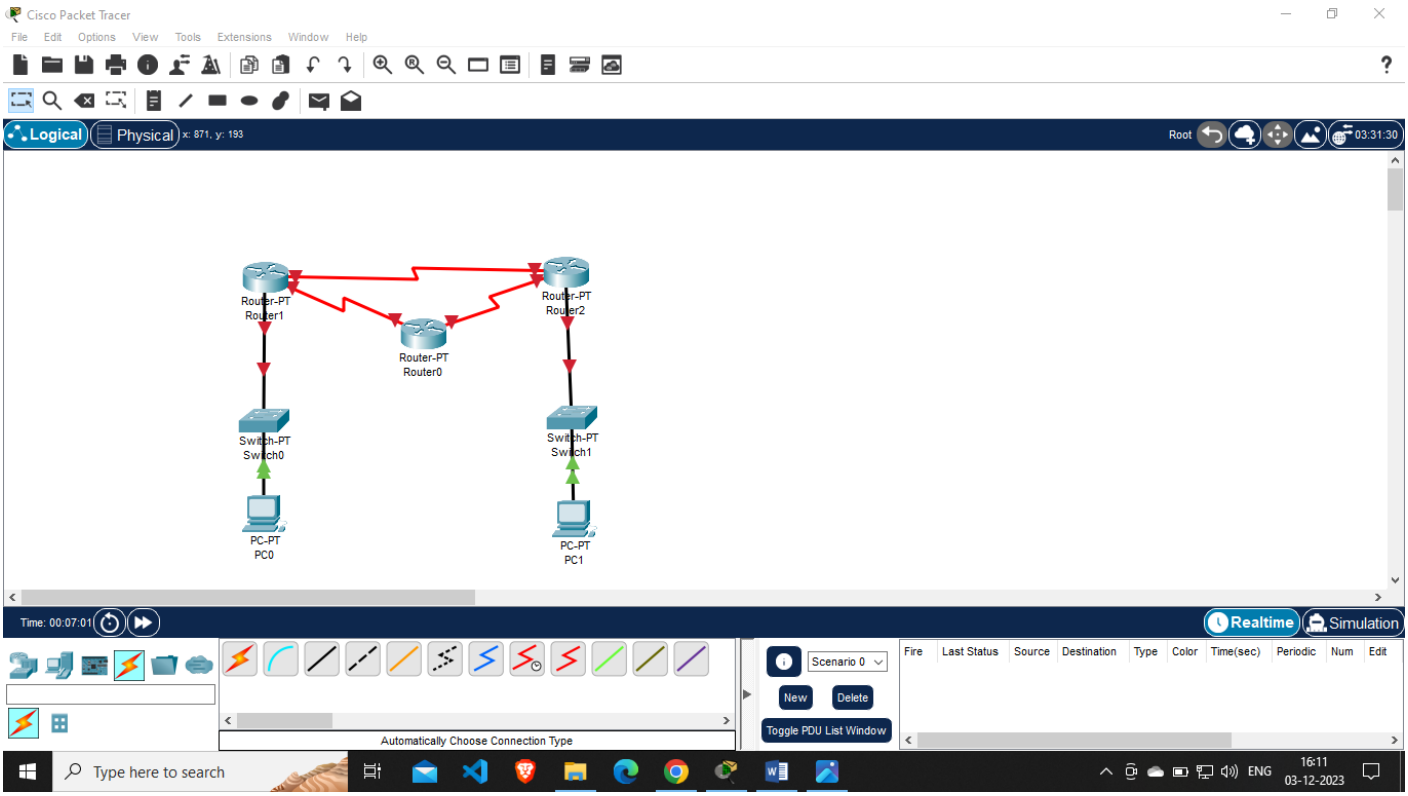

Cisco Packet Tracer
File Edit Options View Tools Extensions Window Help
Logical
Physical
x: 626, y: 418
Root
16:42:00
Router-PT
Router0
Router-PT
Router1
Switch-PT
Switch0
Switch-PT
Switch1
PC-PT
PC0
PC-PT
PC1
Time: 00:38:25
Realtime
Simulation
Automatically Choose Connection Type
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Successful
PC0
PC1
ICMP
0.000
N
0
(edit)
Type here to search
ENG
15:57
03-12-2023

# Program No. 9

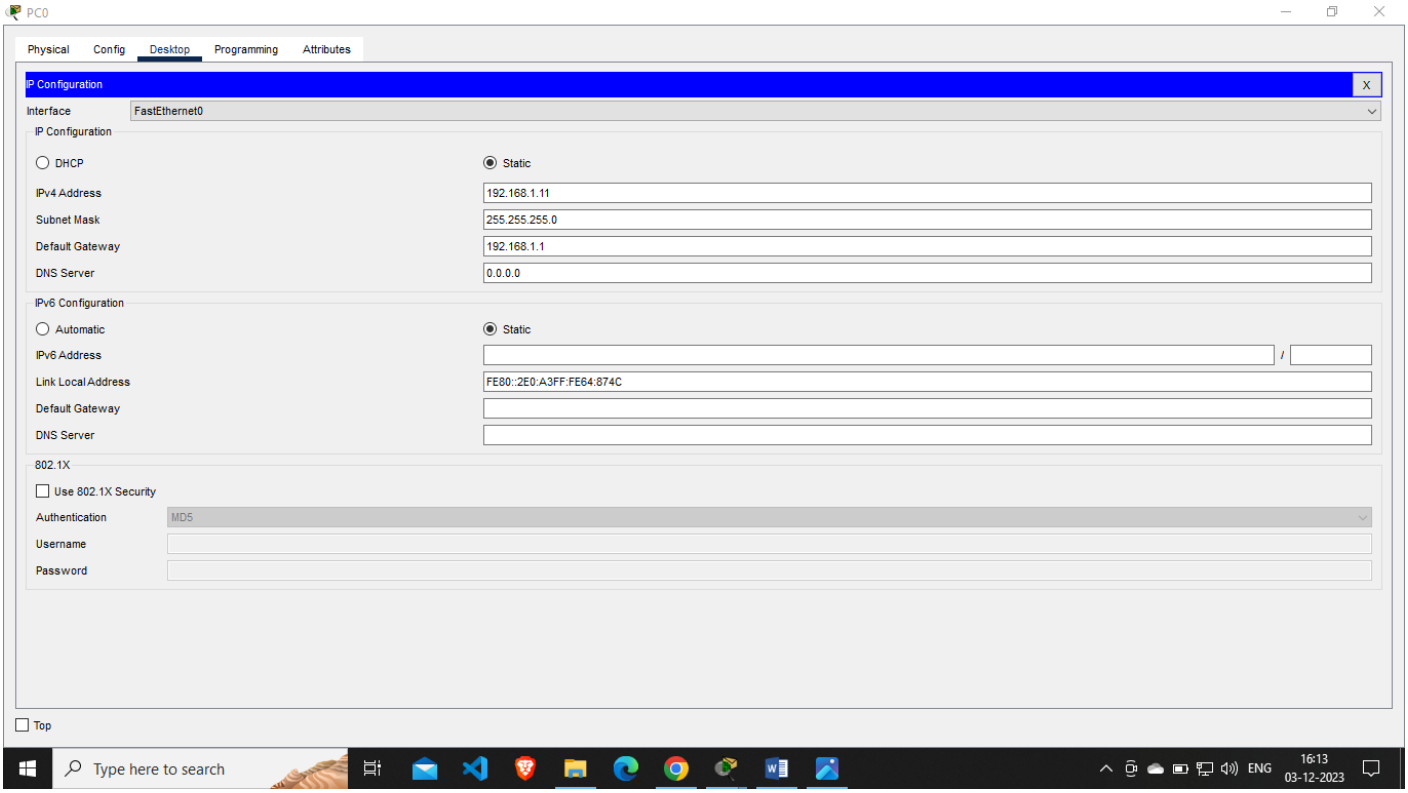
# To connect two networks and implement OSPF using cisco packet tracer

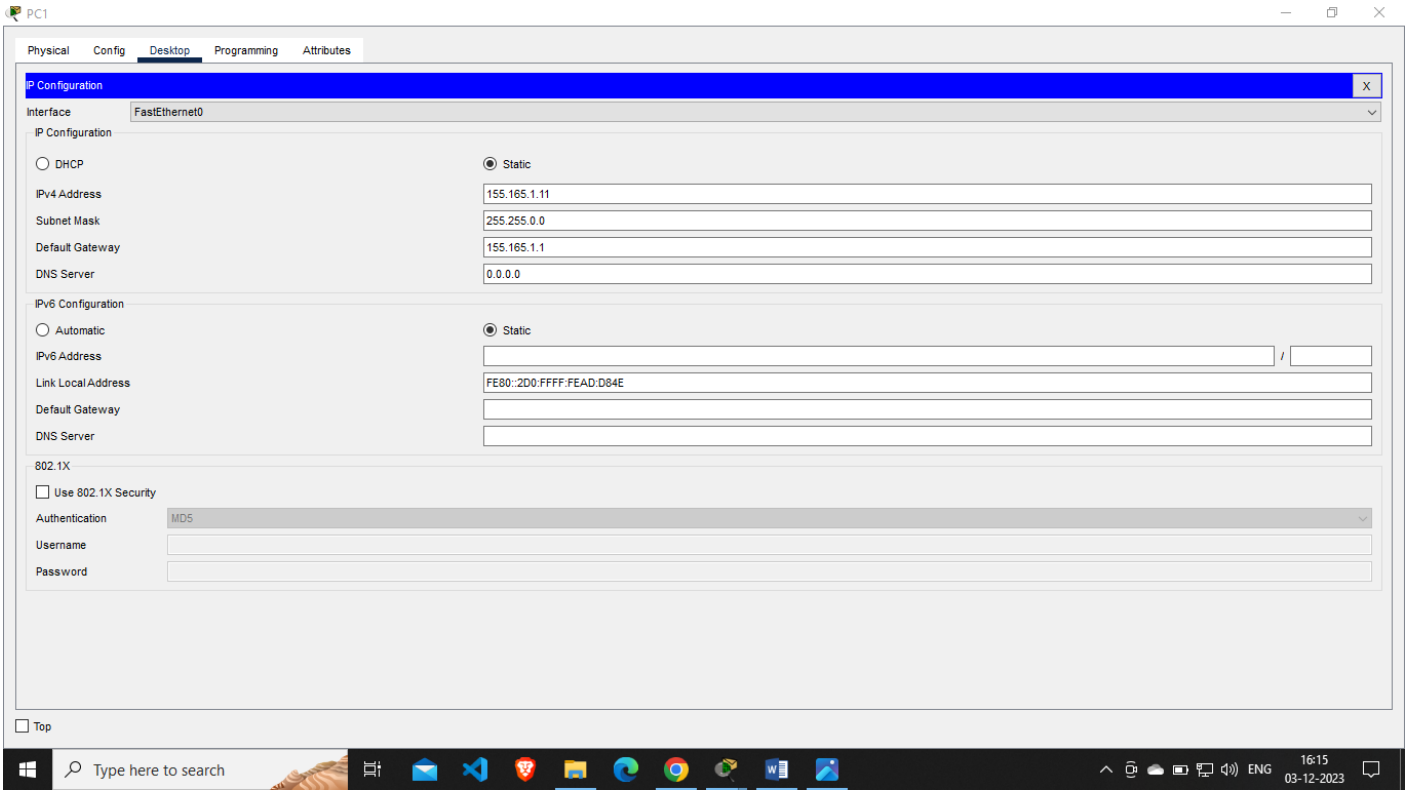
Steps:

1. Make the connections as shown below:

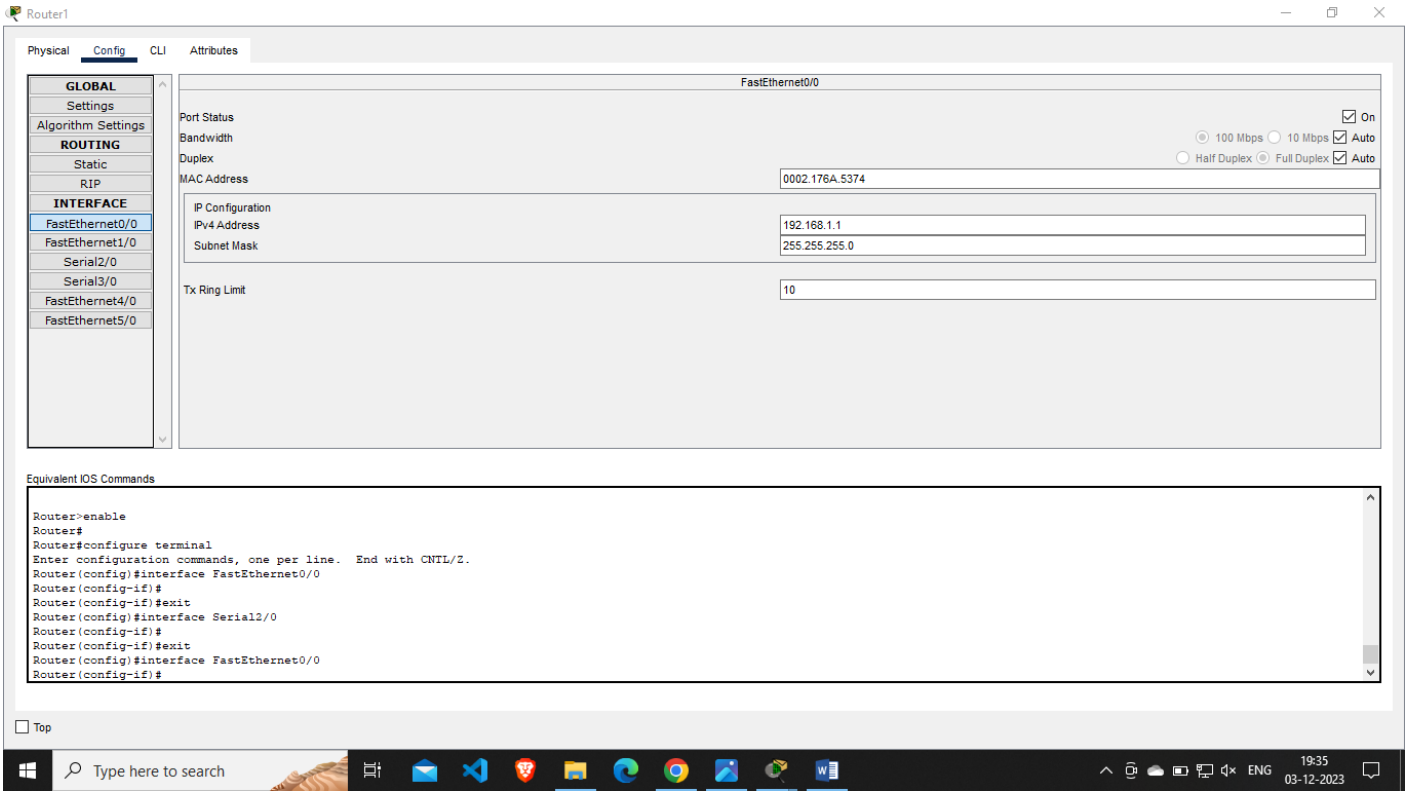


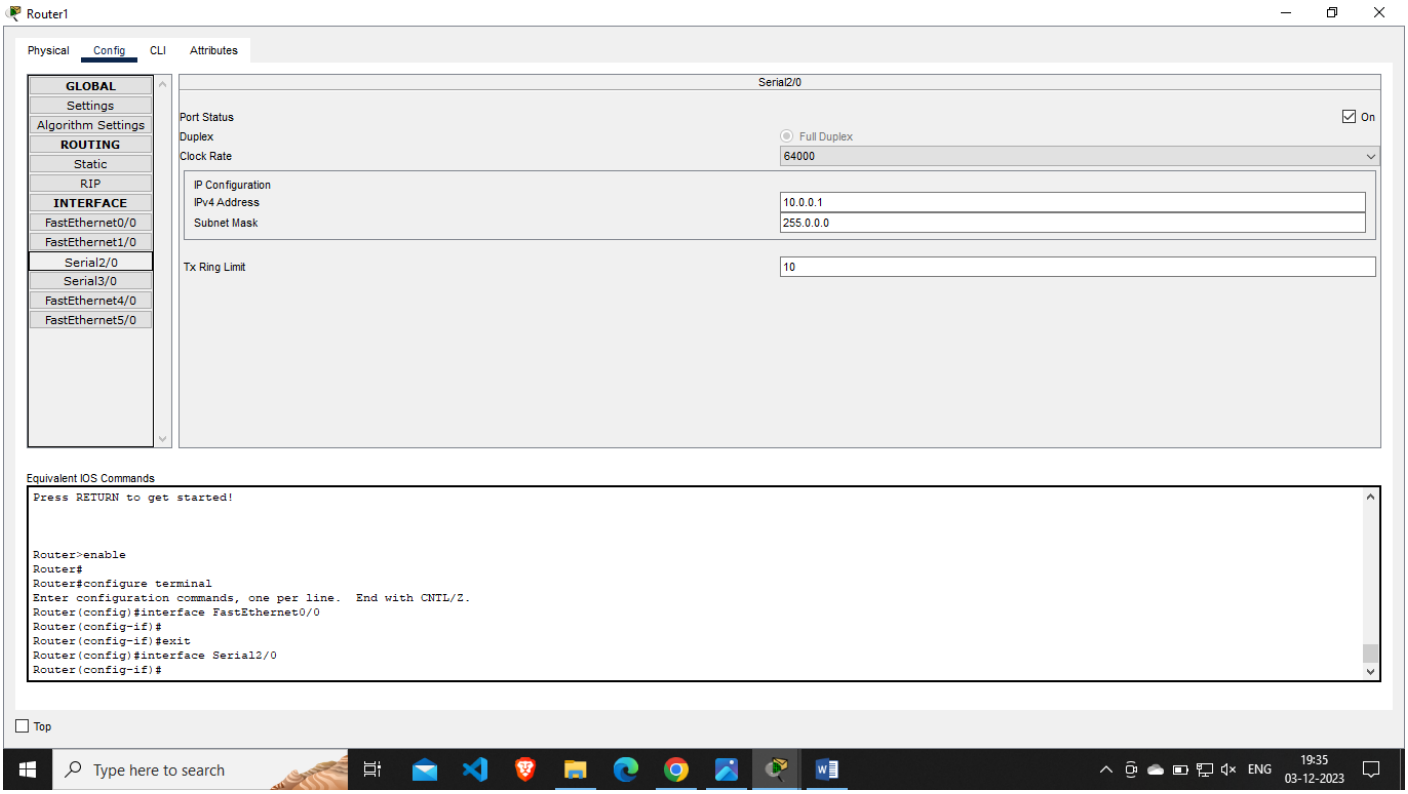

2. Configure the two PC as shown below

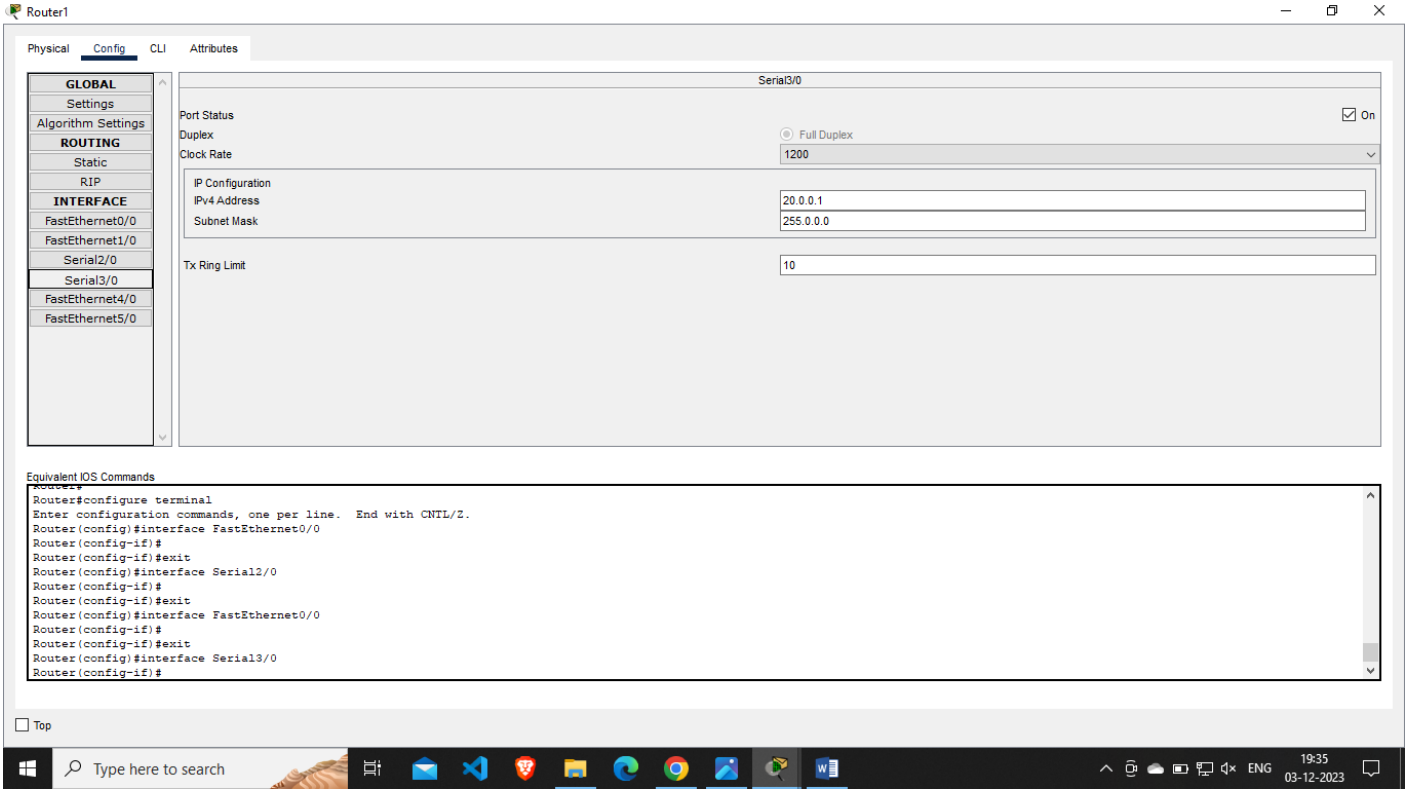


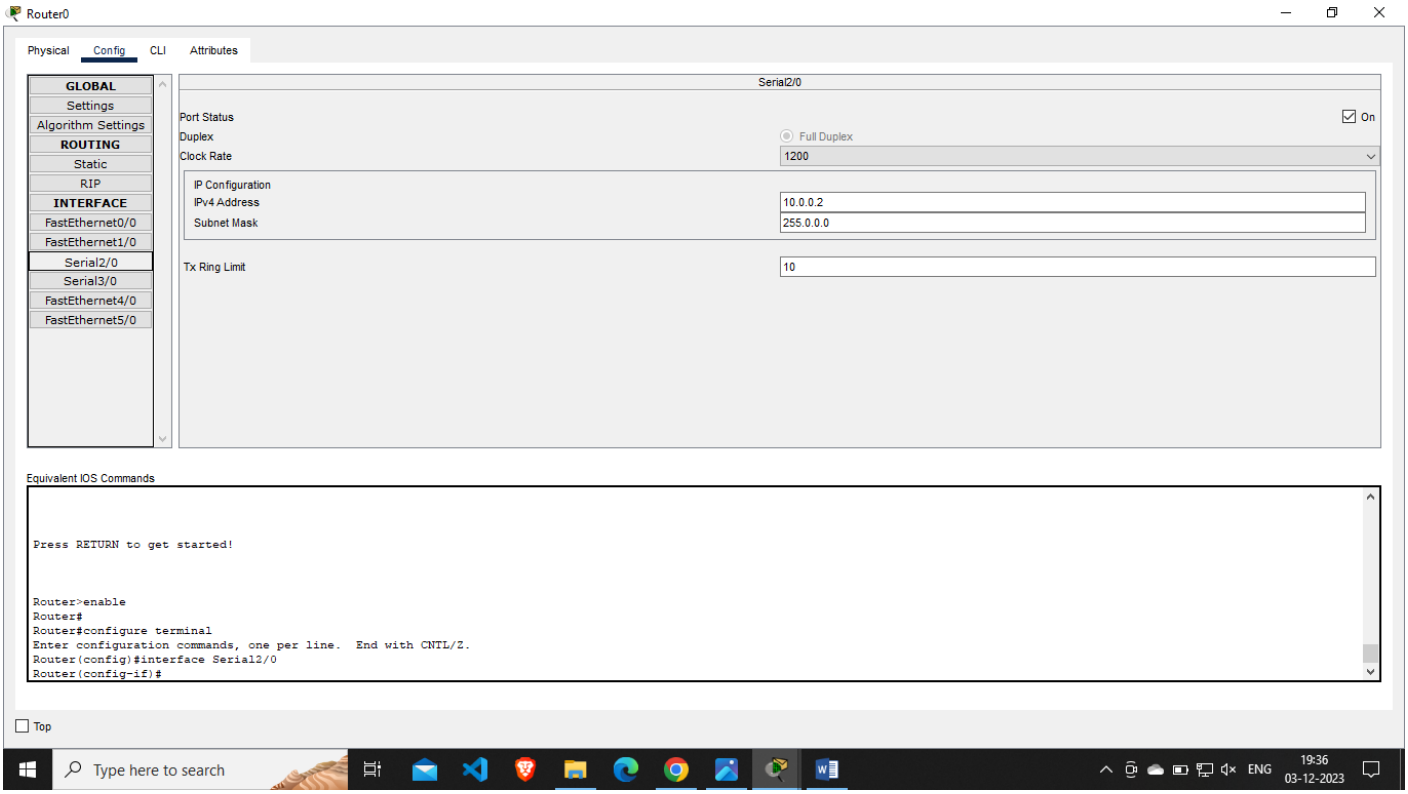


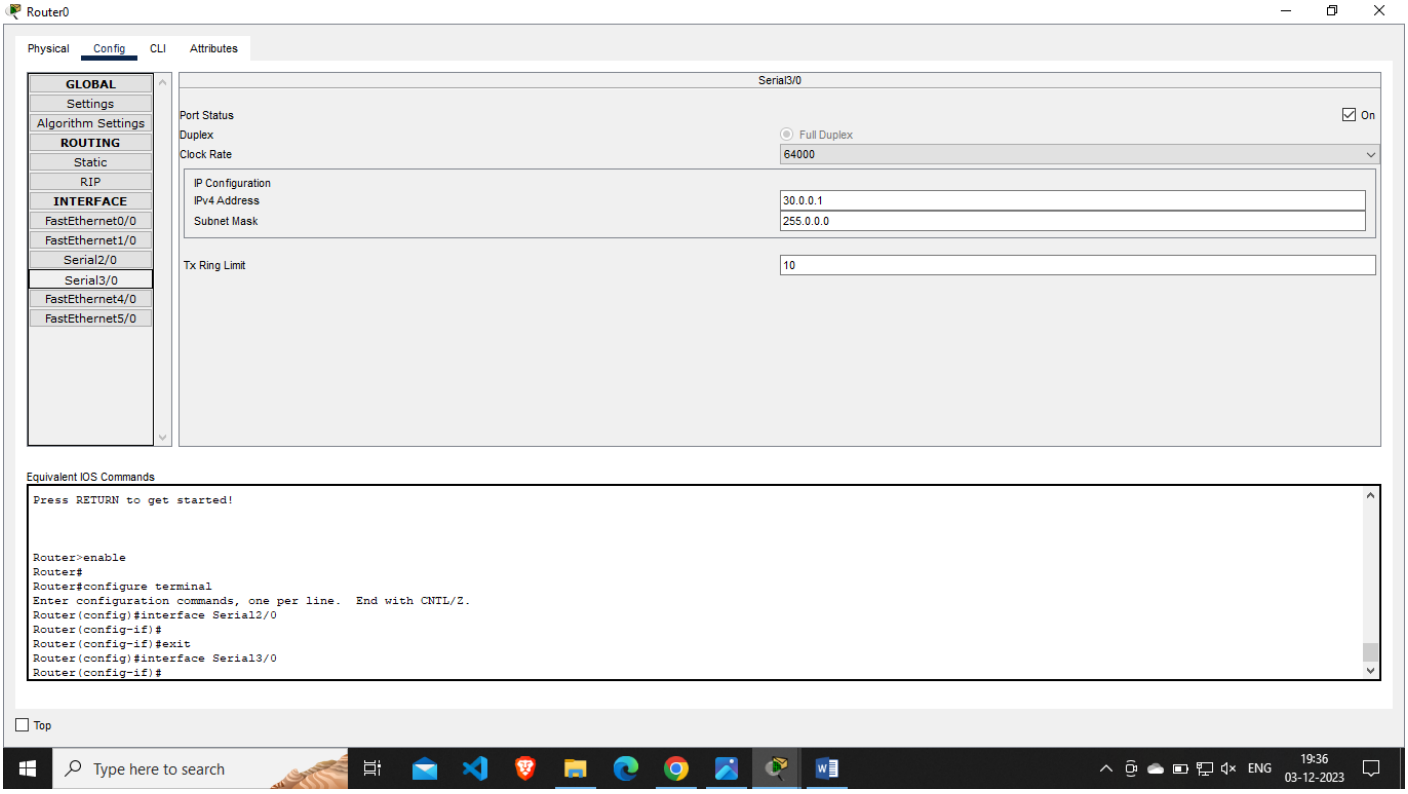

3. Configure the routers as shown below

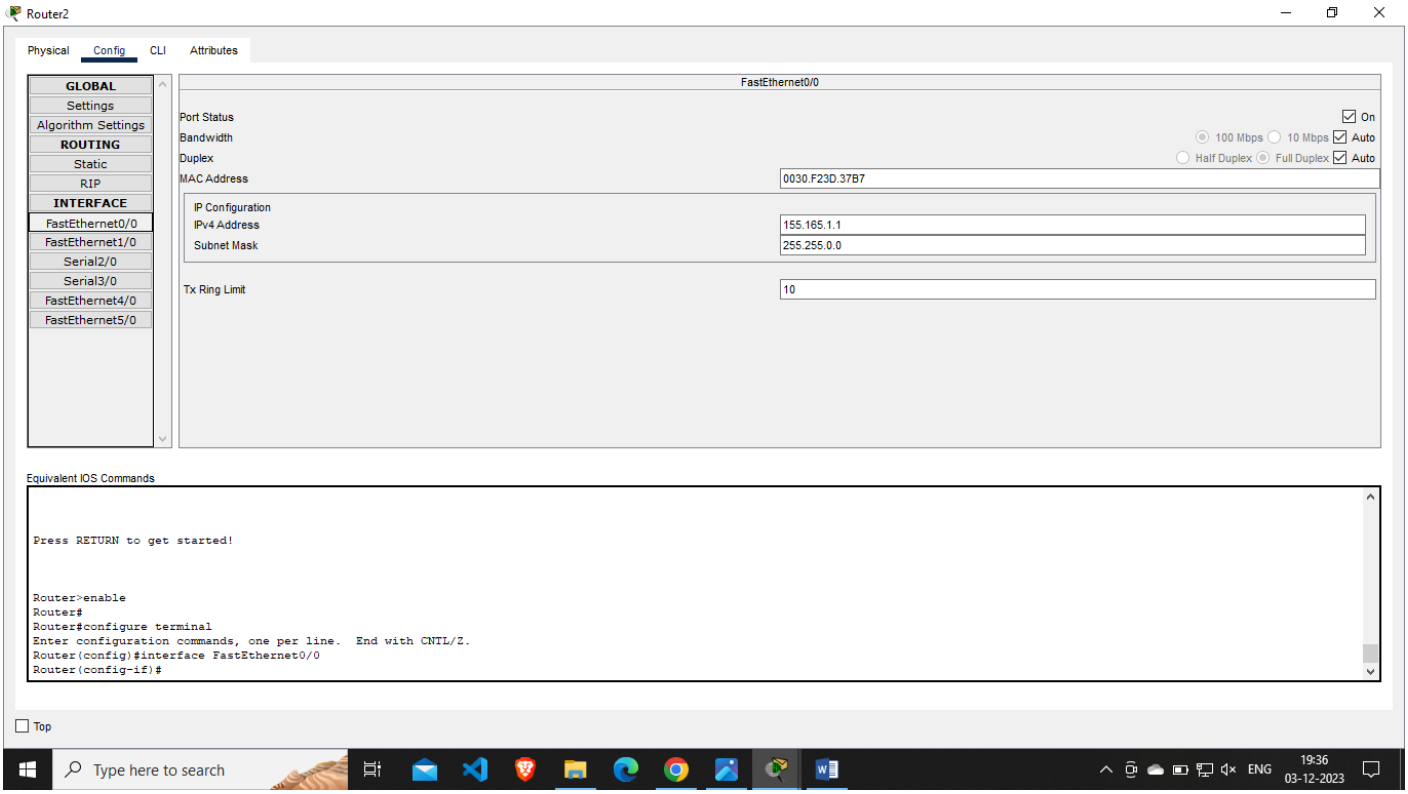


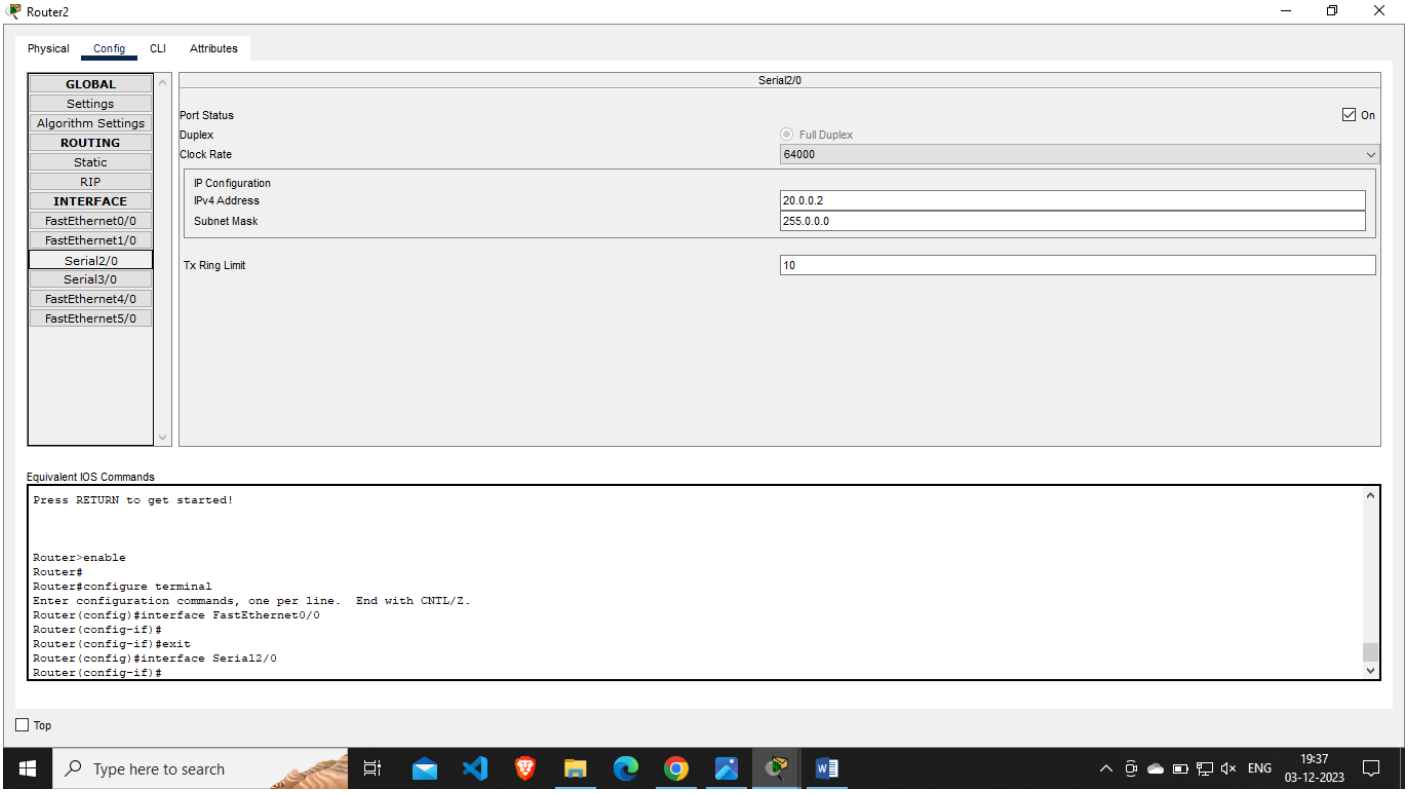

Router1
Physical
Config
CLI
Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
INTERFACE
FastEthernet0/0
FastEthernet1/0
Serial2/0
Serial3/0
FastEthernet4/0
FastEthernet5/0
Serial2/0
Port Status
On
Duplex
Full Duplex
Clock Rate
64000
IP Configuration
IPv4 Address
10.0.0.1
Subnet Mask
255.0.0.0
Tx Ring Limit
10
Equivalent IOS Commands
Press RETURN to get started!
Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface FastEthernet0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial2/0
Router(config-if)#
Top
Type here to search
ENG
19:35
03-12-2023

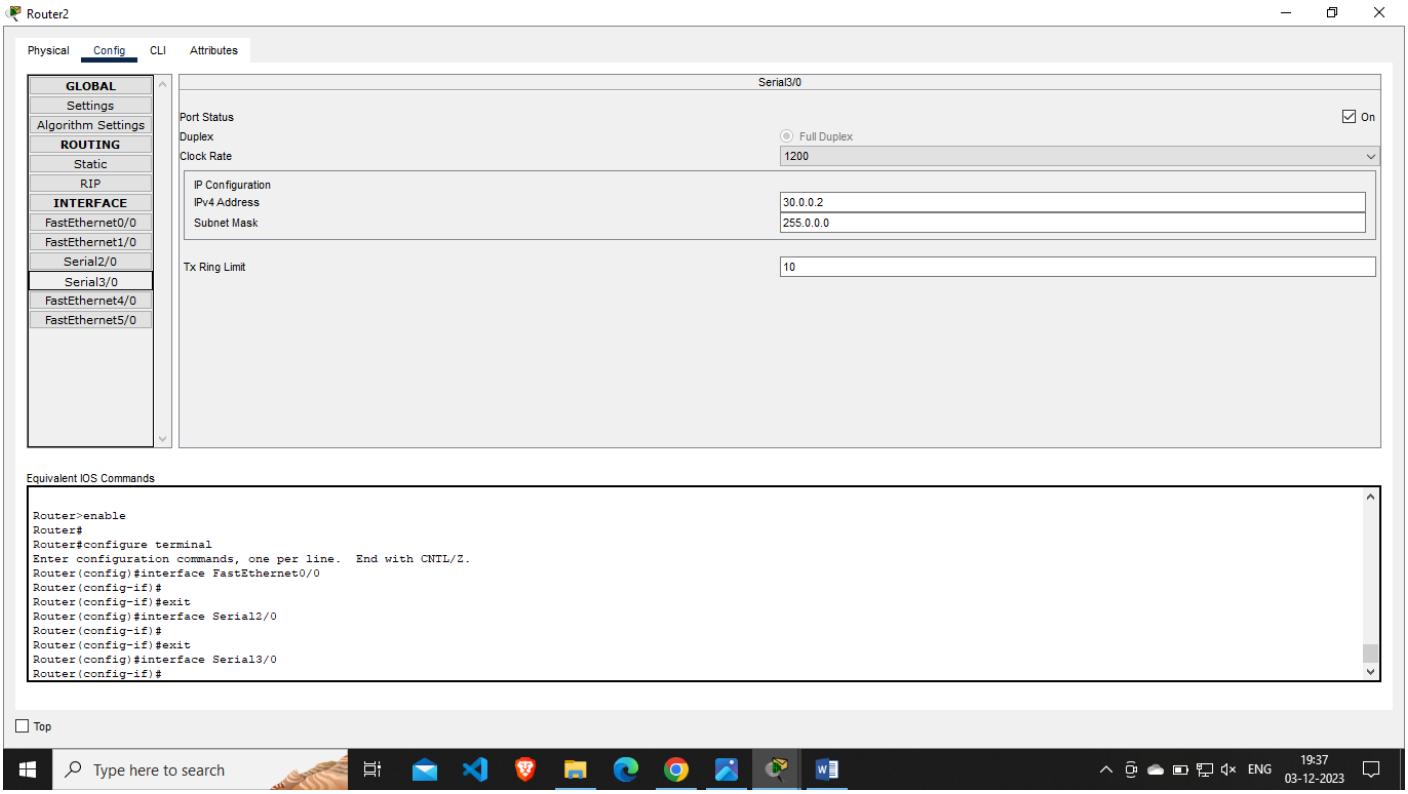

Router1
Physical
Config
CLI
Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
INTERFACE
FastEthernet0/0
FastEthernet1/0
Serial2/0
Serial3/0
FastEthernet4/0
FastEthernet5/0
Serial3/0
Port Status
On
Duplex
Full Duplex
Clock Rate
1200
IP Configuration
IPv4 Address
20.0.0.1
Subnet Mask
255.0.0.0
Tx Ring Limit
10
Equivalent IOS Commands
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface FastEthernet0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial2/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial3/0
Router(config-if)#
Top
Type here to search
ENG
19:35
03-12-2023

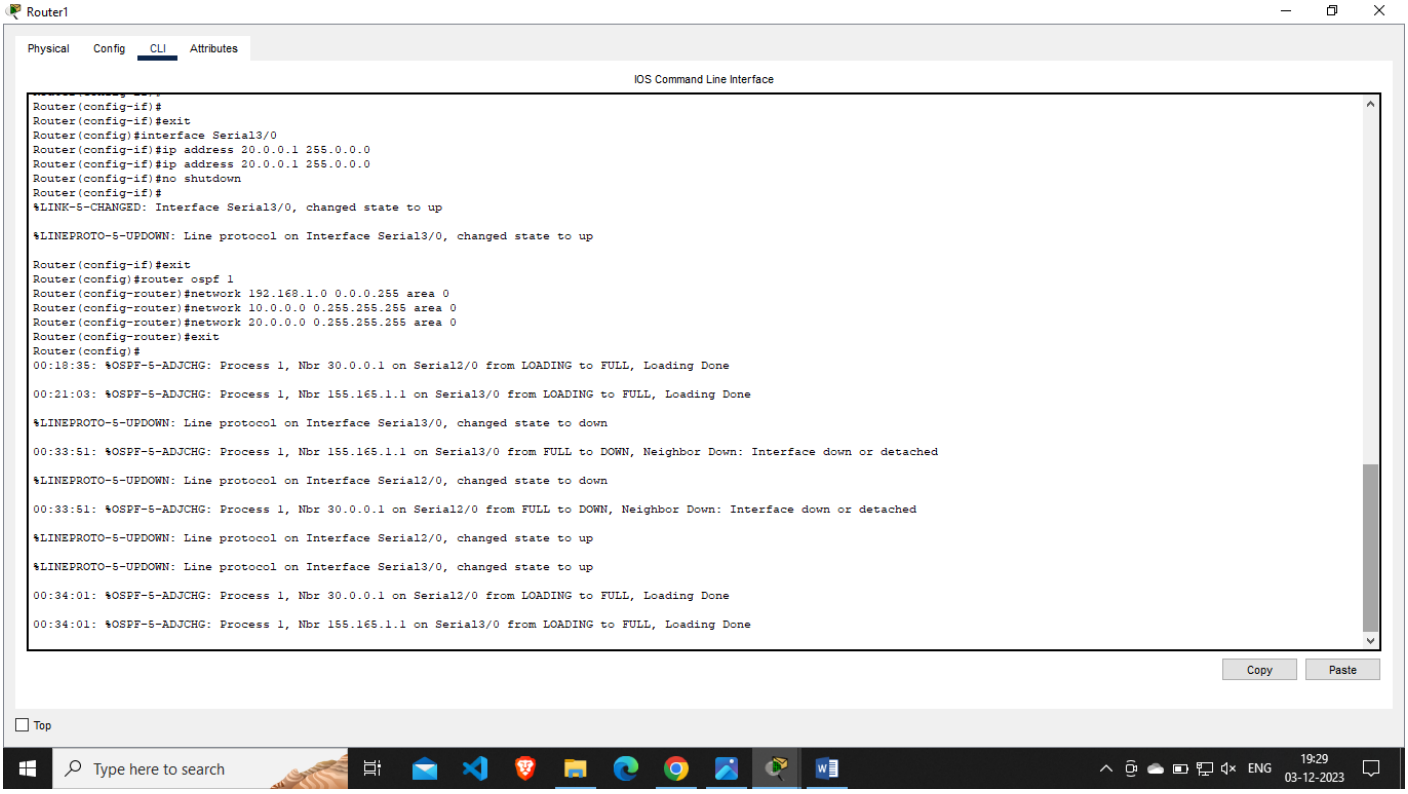

Router0
Physical
Config
CLI
Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
INTERFACE
FastEthernet0/0
FastEthernet1/0
Serial2/0
Serial3/0
FastEthernet4/0
FastEthernet5/0
Serial2/0
Port Status
On
Duplex
Full Duplex
Clock Rate
1200
IP Configuration
IPv4 Address
10.0.0.2
Subnet Mask
255.0.0.0
Tx Ring Limit
10
Equivalent IOS Commands
Press RETURN to get started!
Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface Serial2/0
Router(config-if)#
Top
Type here to search
ENG
19:36
03-12-2023

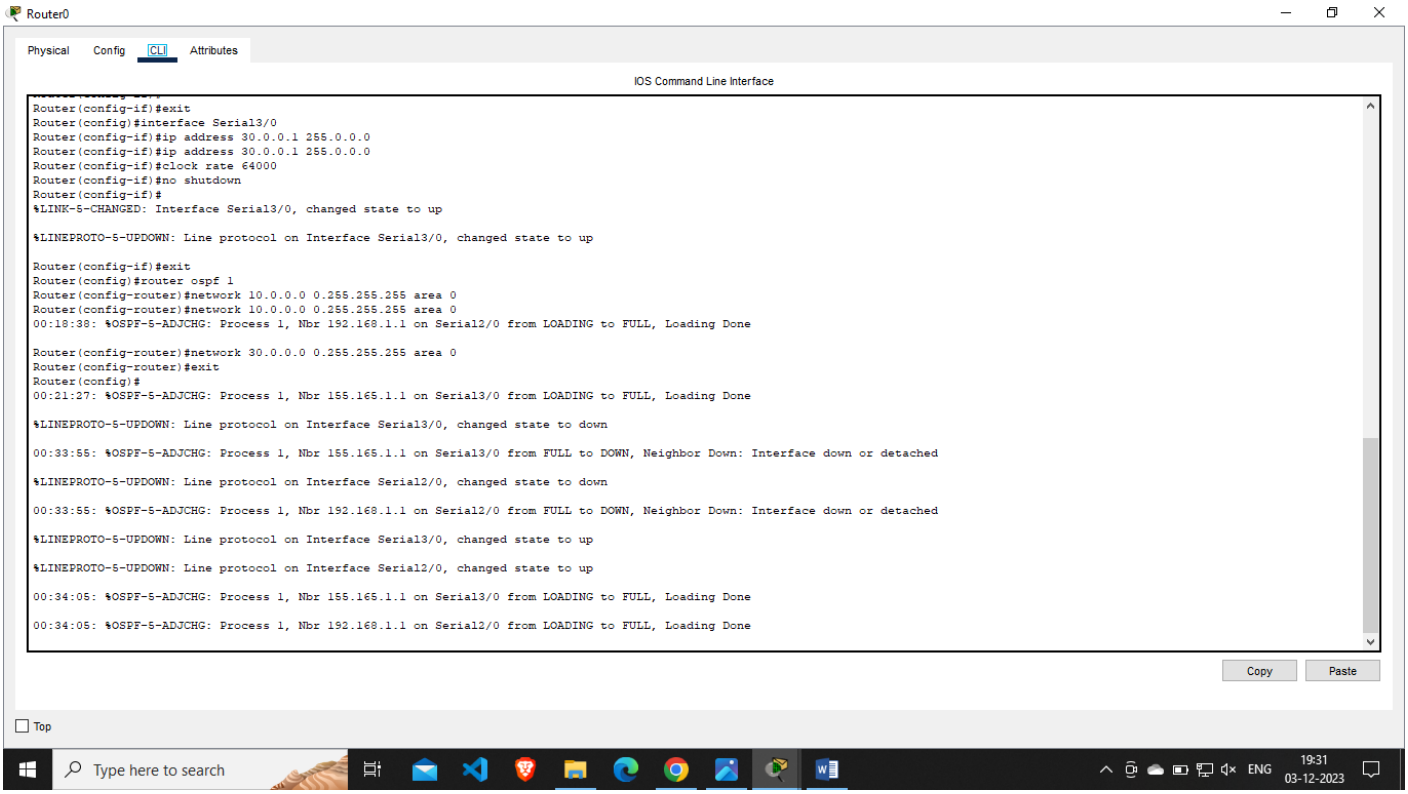

Router0
Physical
Config
CLI
Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
INTERFACE
FastEthernet0/0
FastEthernet1/0
Serial2/0
Serial3/0
FastEthernet4/0
FastEthernet5/0
Serial3/0
Port Status
On
Duplex
Full Duplex
Clock Rate
64000
IP Configuration
IPv4 Address
30.0.0.1
Subnet Mask
255.0.0.0
Tx Ring Limit
10
Equivalent IOS Commands
Press RETURN to get started!
Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface Serial2/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial3/0
Router(config-if)#
Top
Type here to search
ENG
19:36
03-12-2023


Router2
Physical
Config
CLI
Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
INTERFACE
FastEthernet0/0
FastEthernet1/0
Serial2/0
Serial3/0
FastEthernet4/0
FastEthernet5/0
FastEthernet0/0
Port Status
On
Bandwidth
100 Mbps
10 Mbps
Auto
Duplex
Half Duplex
Full Duplex
Auto
MAC Address
0030.F23D.37B7
IP Configuration
IPv4 Address
155.165.1.1
Subnet Mask
255.255.0.0
Tx Ring Limit
10
Equivalent IOS Commands
Press RETURN to get started!
Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface FastEthernet0/0
Router(config-if)#
Top
Type here to search
ENG
19:36
03-12-2023


Router2
Physical
Config
CLI
Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
INTERFACE
FastEthernet0/0
FastEthernet1/0
Serial2/0
Serial3/0
FastEthernet4/0
FastEthernet5/0
Serial2/0
Port Status
On
Duplex
Full Duplex
Clock Rate
64000
IP Configuration
IPv4 Address
20.0.0.2
Subnet Mask
255.0.0.0
Tx Ring Limit
10
Equivalent IOS Commands
Press RETURN to get started!
Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface FastEthernet0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial2/0
Router(config-if)#
Top
Type here to search
ENG
19:37
03-12-2023


Router2
Physical
Config
CLI
Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
INTERFACE
FastEthernet0/0
FastEthernet1/0
Serial2/0
Serial3/0
FastEthernet4/0
FastEthernet5/0
Serial3/0
Port Status
On
Duplex
Full Duplex
Clock Rate
1200
IP Configuration
IPv4 Address
30.0.0.2
Subnet Mask
255.0.0.0
Tx Ring Limit
10
Equivalent IOS Commands
Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface FastEthernet0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial2/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial3/0
Router(config-if)#
Top
Type here to search
ENG
19:37
03-12-2023


Router1
Physical
Config
CLI
Attributes
IOS Command Line Interface
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial3/0
Router(config-if)#ip address 20.0.0.1 255.0.0.0
Router(config-if)#ip address 20.0.0.1 255.0.0.0
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface Serial3/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/0, changed state to up
Router(config-if)#exit
Router(config)#router ospf 1
Router(config-router)#network 192.168.1.0 0.0.0.255 area 0
Router(config-router)#network 10.0.0.0 0.255.255.255 area 0
Router(config-router)#network 20.0.0.0 0.255.255.255 area 0
Router(config-router)#exit
Router(config)#
00:18:35: %OSPF-5-ADJCHG: Process 1, Nbr 30.0.0.1 on Serial2/0 from LOADING to FULL, Loading Done
00:21:03: %OSPF-5-ADJCHG: Process 1, Nbr 155.165.1.1 on Serial3/0 from LOADING to FULL, Loading Done
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/0, changed state to down
00:33:51: %OSPF-5-ADJCHG: Process 1, Nbr 155.165.1.1 on Serial3/0 from FULL to DOWN, Neighbor Down: Interface down or detached
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to down
00:33:51: %OSPF-5-ADJCHG: Process 1, Nbr 30.0.0.1 on Serial2/0 from FULL to DOWN, Neighbor Down: Interface down or detached
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/0, changed state to up
00:34:01: %OSPF-5-ADJCHG: Process 1, Nbr 30.0.0.1 on Serial2/0 from LOADING to FULL, Loading Done
00:34:01: %OSPF-5-ADJCHG: Process 1, Nbr 155.165.1.1 on Serial3/0 from LOADING to FULL, Loading Done
Copy
Paste
Top
Type here to search
ENG
19:29
03-12-2023


Router0
Physical
Config
CLI
Attributes
IOS Command Line Interface
Router(config-if)#exit
Router(config)#interface Serial3/0
Router(config-if)#ip address 30.0.0.1 255.0.0.0
Router(config-if)#ip address 30.0.0.1 255.0.0.0
Router(config-if)#clock rate 64000
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface Serial3/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/0, changed state to up
Router(config-if)#exit
Router(config)#router ospf 1
Router(config-router)#network 10.0.0.0 0.255.255.255 area 0
Router(config-router)#network 10.0.0.0 0.255.255.255 area 0
00:18:38: %OSPF-5-ADJCHG: Process 1, Nbr 192.168.1.1 on Serial2/0 from LOADING to FULL, Loading Done
Router(config-router)#network 30.0.0.0 0.255.255.255 area 0
Router(config-router)#exit
Router(config)#
00:21:27: %OSPF-5-ADJCHG: Process 1, Nbr 155.165.1.1 on Serial3/0 from LOADING to FULL, Loading Done
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/0, changed state to down
00:33:55: %OSPF-5-ADJCHG: Process 1, Nbr 155.165.1.1 on Serial3/0 from FULL to DOWN, Neighbor Down: Interface down or detached
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to down
00:33:55: %OSPF-5-ADJCHG: Process 1, Nbr 192.168.1.1 on Serial2/0 from FULL to DOWN, Neighbor Down: Interface down or detached
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
00:34:05: %OSPF-5-ADJCHG: Process 1, Nbr 155.165.1.1 on Serial3/0 from LOADING to FULL, Loading Done
00:34:05: %OSPF-5-ADJCHG: Process 1, Nbr 192.168.1.1 on Serial2/0 from LOADING to FULL, Loading Done
Copy
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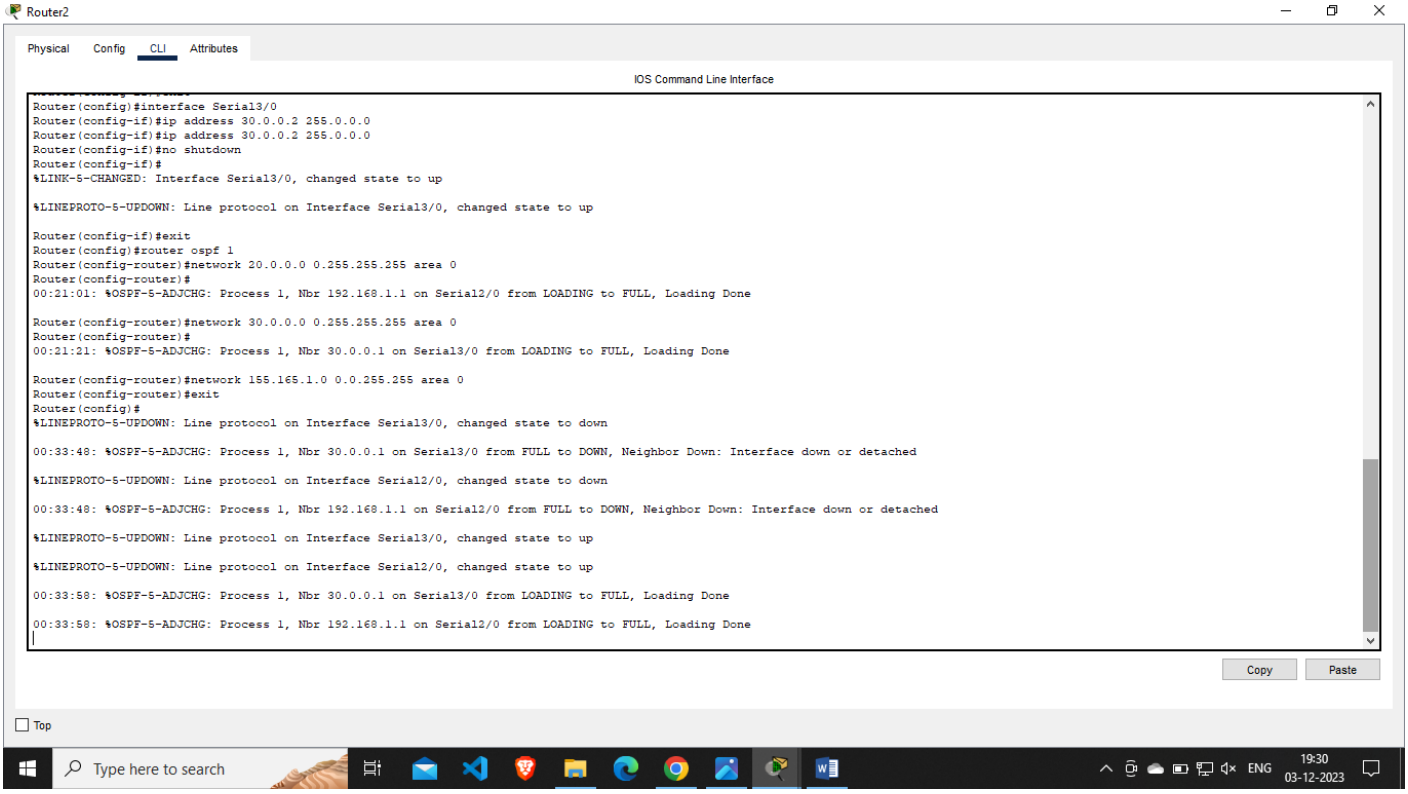
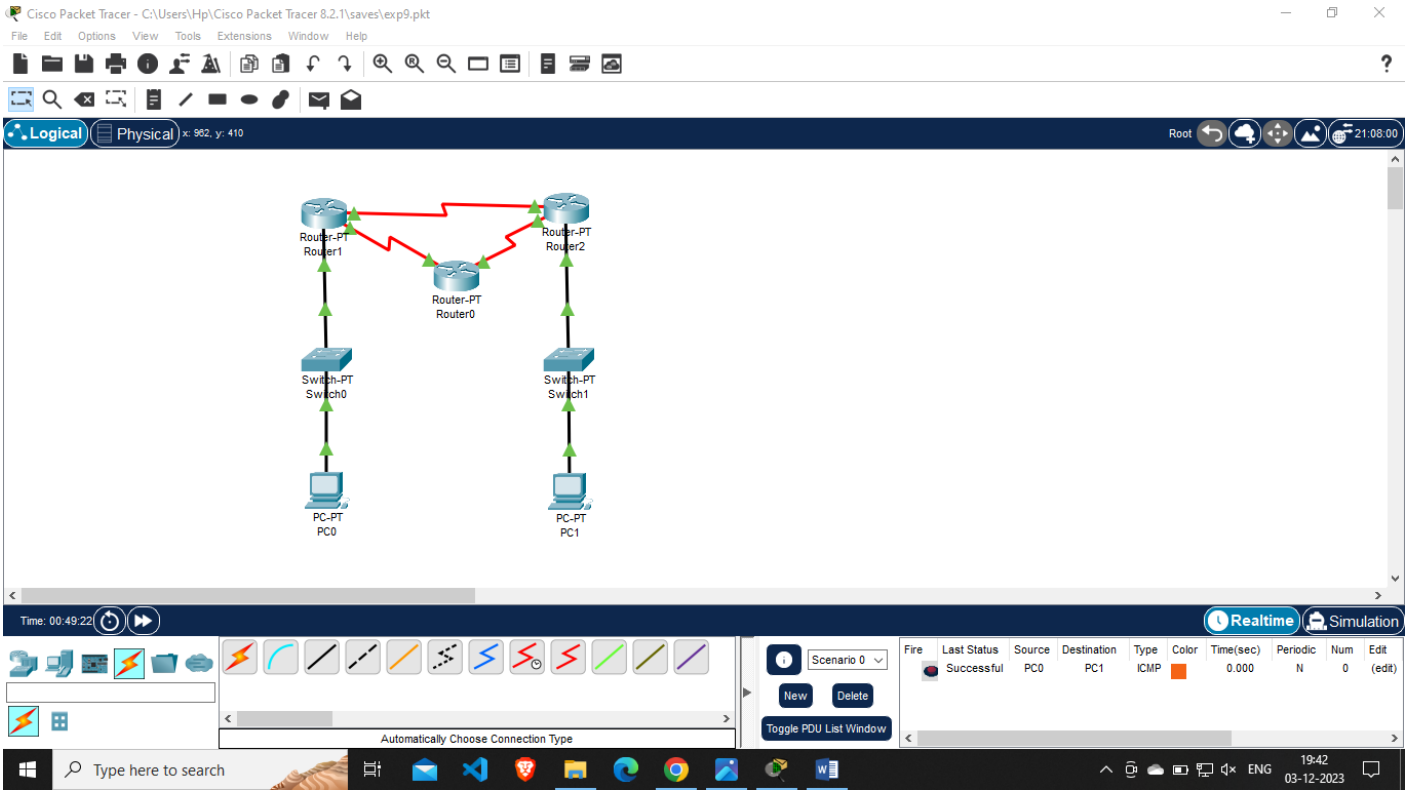
Top
Type here to search
ENG
19:31
03-12-2023


Router2
Physical
Config
CLI
Attributes
IOS Command Line Interface
Router(config)#interface Serial3/0
Router(config-if)#ip address 30.0.0.2 255.0.0.0
Router(config-if)#ip address 30.0.0.2 255.0.0.0
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface Serial3/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/0, changed state to up
Router(config-if)#exit
Router(config)#router ospf 1
Router(config-router)#network 20.0.0.0 0.255.255.255 area 0
Router(config-router)#
00:21:01: %OSPF-5-ADJCHG: Process 1, Nbr 192.168.1.1 on Serial2/0 from LOADING to FULL, Loading Done
Router(config-router)#network 30.0.0.0 0.255.255.255 area 0
Router(config-router)#
00:21:21: %OSPF-5-ADJCHG: Process 1, Nbr 30.0.0.1 on Serial3/0 from LOADING to FULL, Loading Done
Router(config-router)#network 155.165.1.0 0.0.255.255 area 0
Router(config-router)#exit
Router(config)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/0, changed state to down
00:33:48: %OSPF-5-ADJCHG: Process 1, Nbr 30.0.0.1 on Serial3/0 from FULL to DOWN, Neighbor Down: Interface down or detached
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to down
00:33:48: %OSPF-5-ADJCHG: Process 1, Nbr 192.168.1.1 on Serial2/0 from FULL to DOWN, Neighbor Down: Interface down or detached
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
00:33:58: %OSPF-5-ADJCHG: Process 1, Nbr 30.0.0.1 on Serial3/0 from LOADING to FULL, Loading Done
00:33:58: %OSPF-5-ADJCHG: Process 1, Nbr 192.168.1.1 on Serial2/0 from LOADING to FULL, Loading Done
Copy
Paste
Top
Type here to search
ENG
19:30
03-12-2023


Cisco Packet Tracer - C:\Users\Hp\Cisco Packet Tracer 8.2.1\saves\exp9.pkt
File Edit Options View Tools Extensions Window Help
Logical
Physical
x: 962, y: 410
Root
21:08:00
Router-PT
Router1
Router-PT
Router2
Router-PT
Router0
Switch-PT
Switch0
Switch-PT
Switch1
PC-PT
PC0
PC-PT
PC1
Time: 00:49:22
Realtime
Simulation
Automatically Choose Connection Type
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Successful
PC0
PC1
ICMP
0.000
N
0
(edit)
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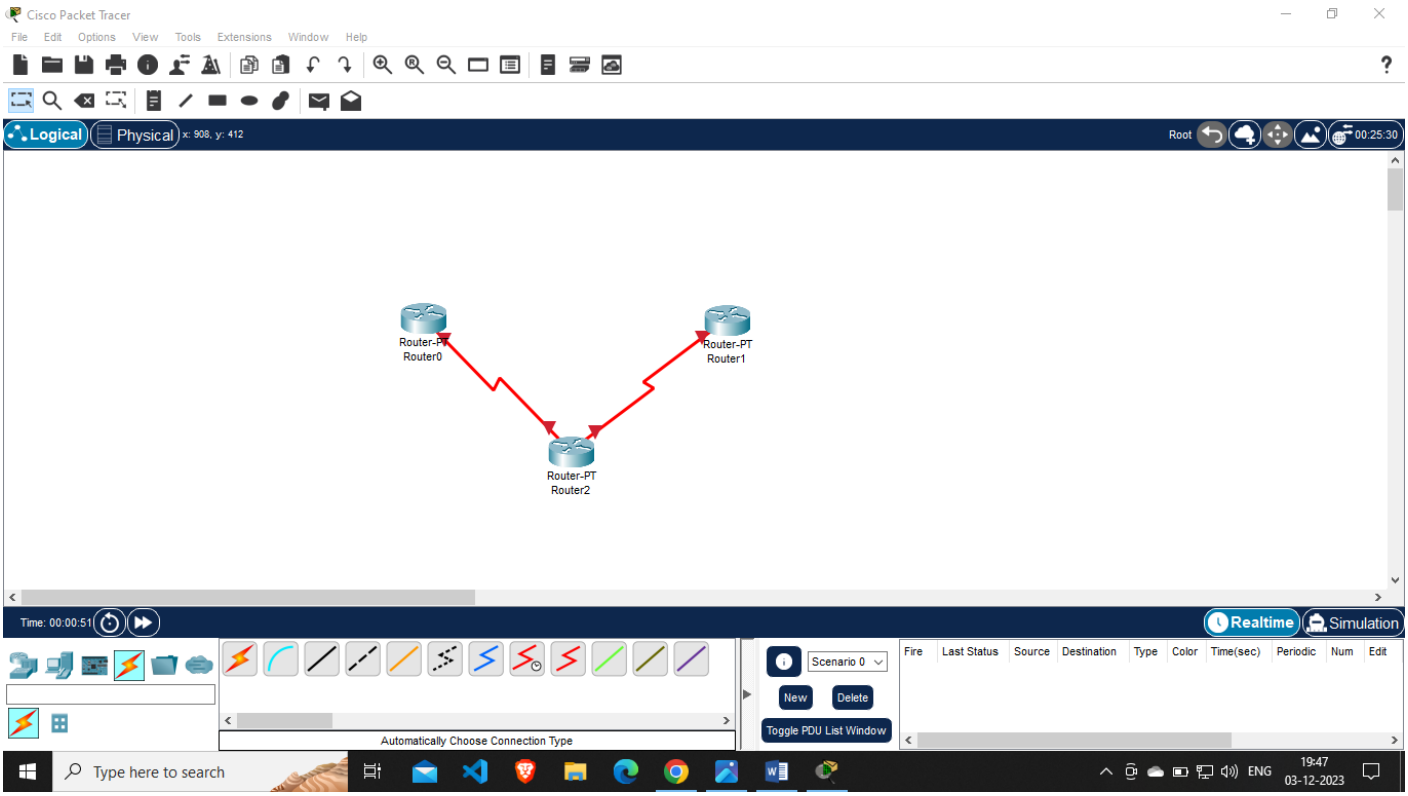
ENG
19:42
03-12-2023

# Program No. 10

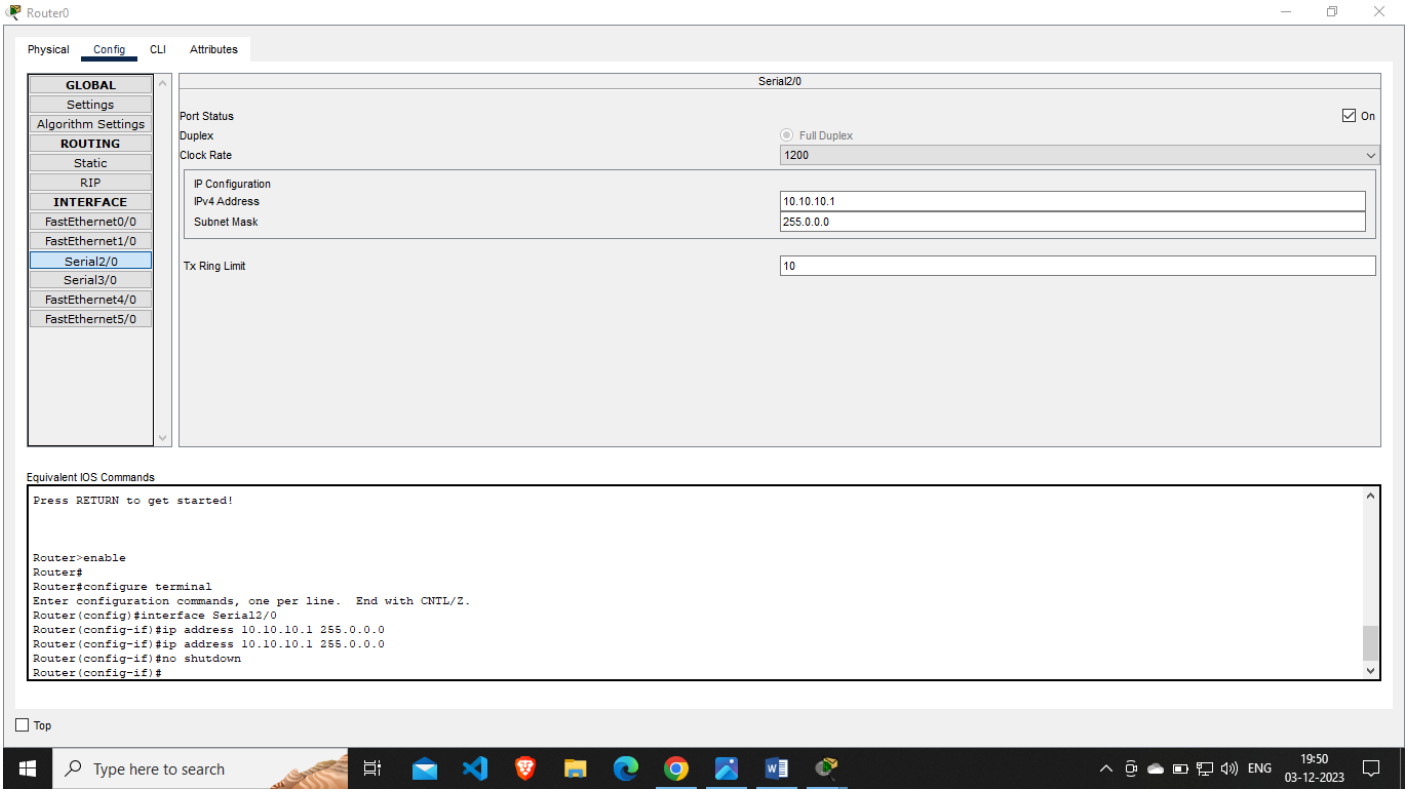
# To connect two networks and implement BGP using cisco packet tracer

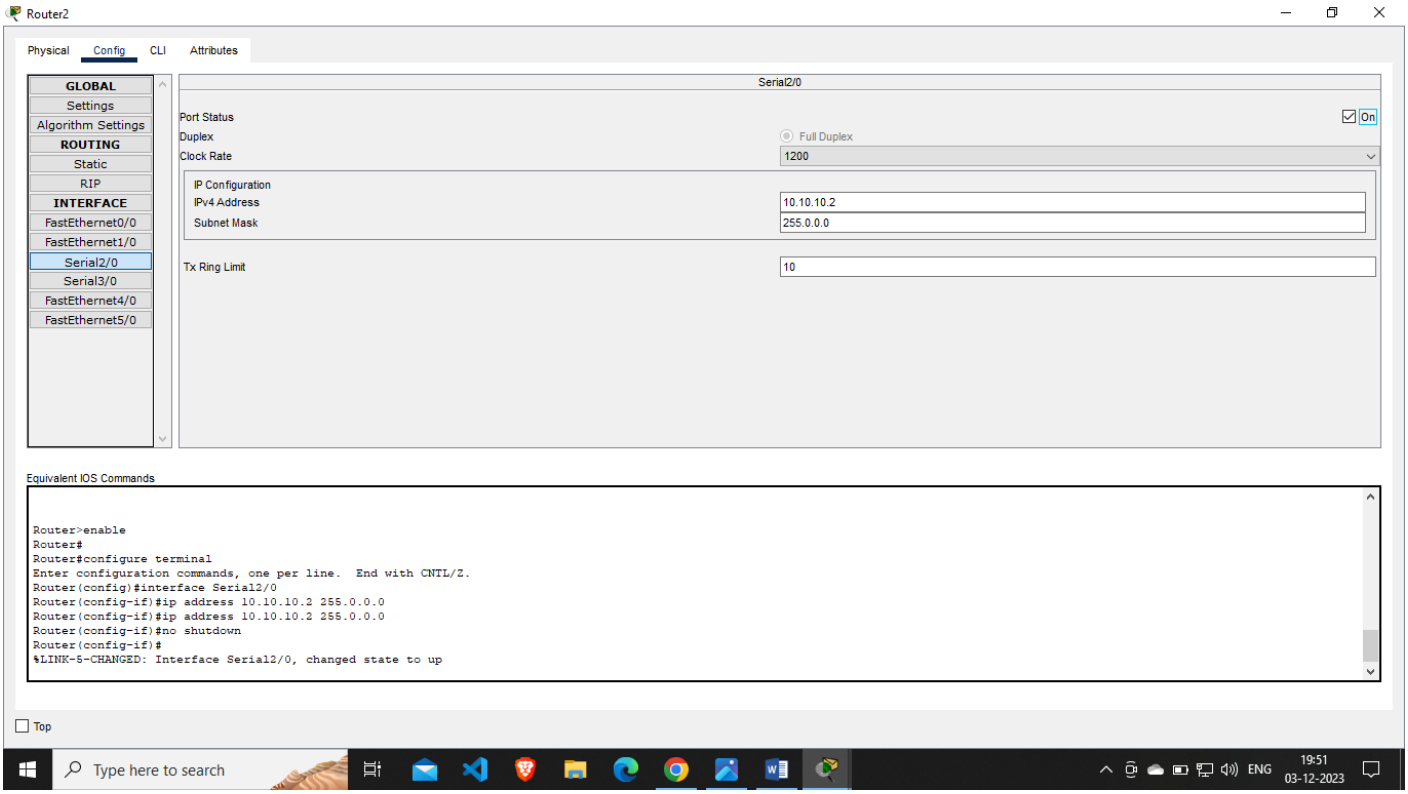
Steps:

1. Make connections as shown below




2. Configure the routers as shown below




Router2
Physical
Config
CLI
Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
INTERFACE
FastEthernet0/0
FastEthernet1/0
Serial2/0
Serial3/0
FastEthernet4/0
FastEthernet5/0
Serial2/0
Port Status
On
Duplex
Full Duplex
Clock Rate
1200
IP Configuration
IPv4 Address
10.10.10.2
Subnet Mask
255.0.0.0
Tx Ring Limit
10
Equivalent IOS Commands
Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface Serial2/0
Router(config-if)#ip address 10.10.10.2 255.0.0.0
Router(config-if)#ip address 10.10.10.2 255.0.0.0
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface Serial2/0, changed state to up
Top
Type here to search
ENG
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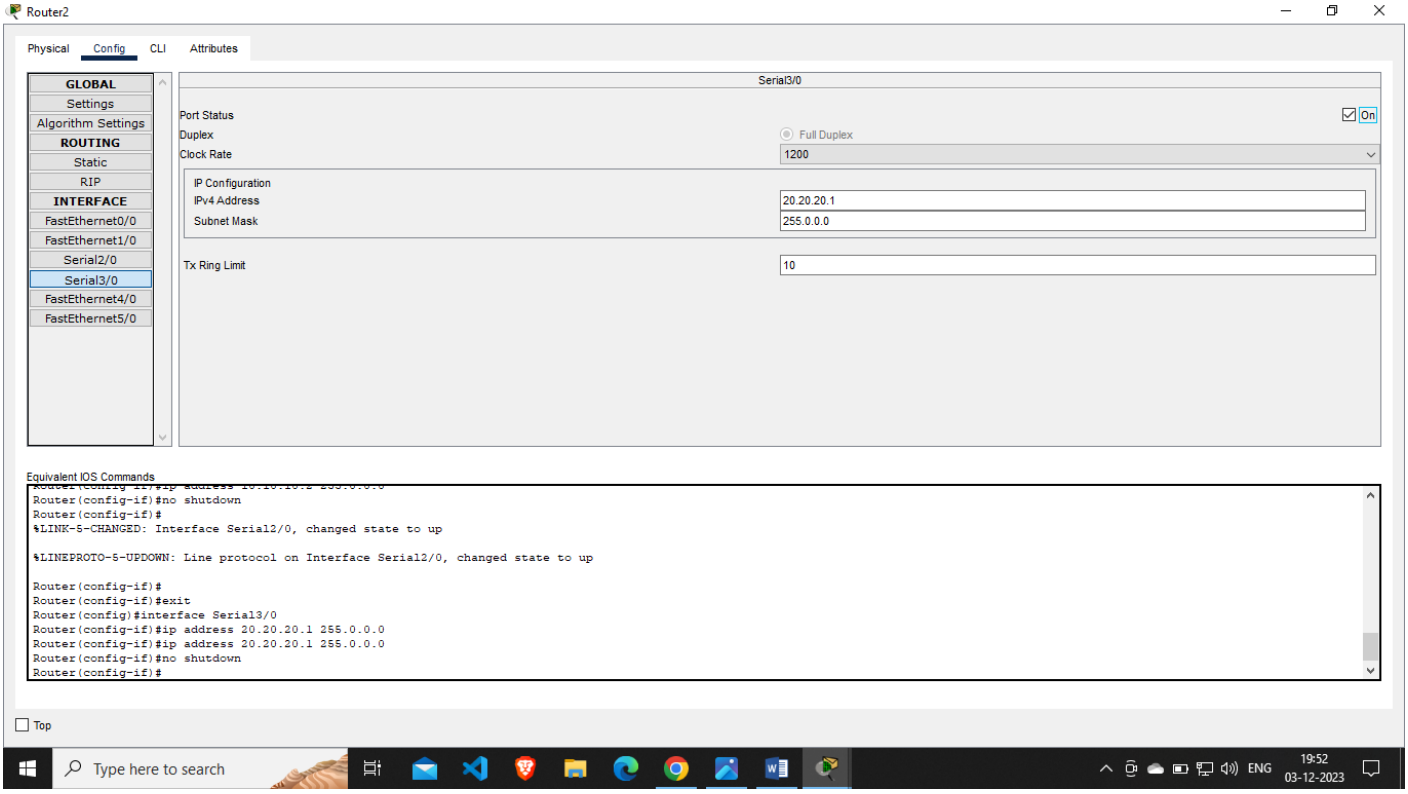
Router2
Physical
Config
CLI
Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
INTERFACE
FastEthernet0/0
FastEthernet1/0
Serial2/0
Serial3/0
FastEthernet4/0
FastEthernet5/0
Serial3/0
Port Status
On
Duplex
Full Duplex
Clock Rate
1200
IP Configuration
IPv4 Address
20.20.20.1
Subnet Mask
255.0.0.0
Tx Ring Limit
10
Equivalent IOS Commands
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface Serial2/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial3/0
Router(config-if)#ip address 20.20.20.1 255.0.0.0
Router(config-if)#ip address 20.20.20.1 255.0.0.0
Router(config-if)#no shutdown
Router(config-if)#
Top
Type here to search
ENG
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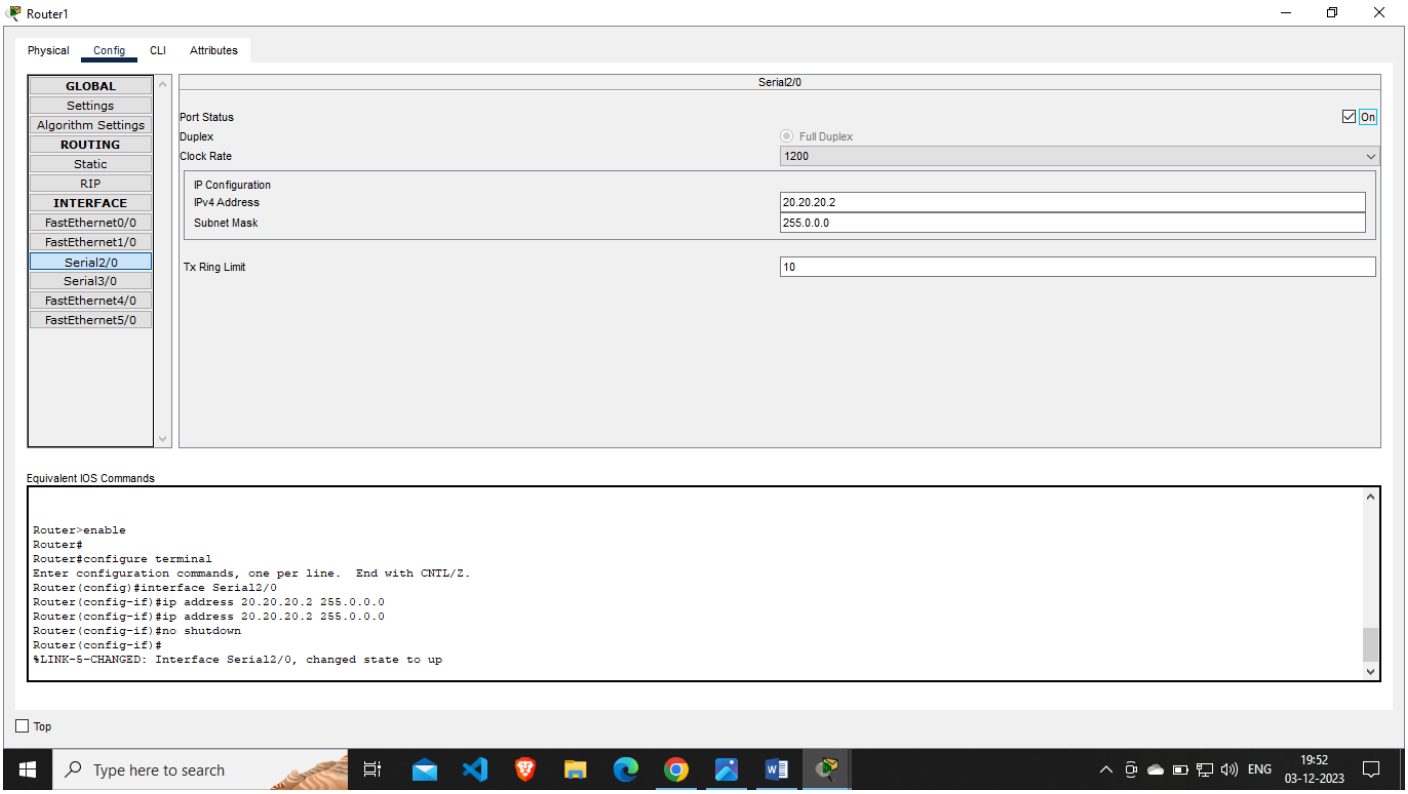
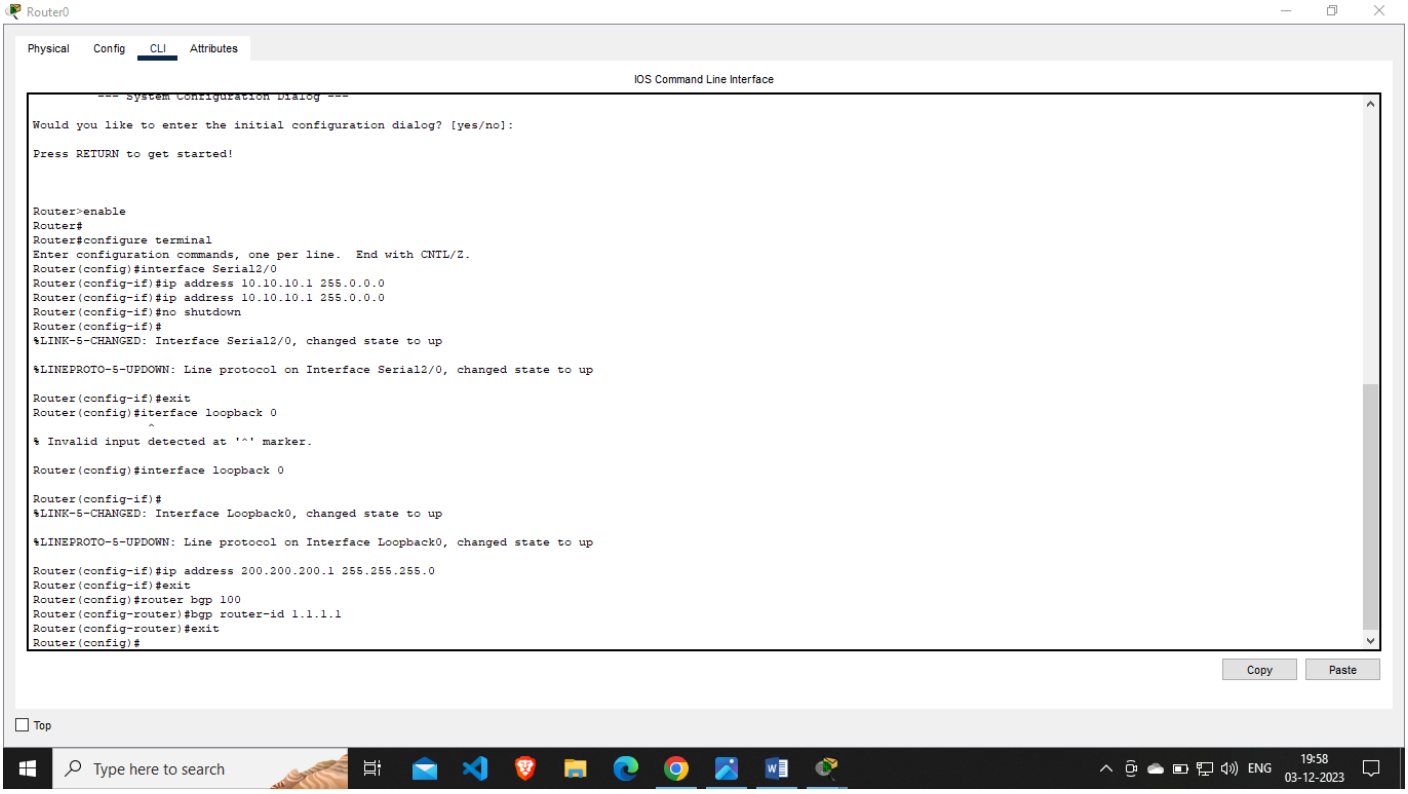

Router1
Physical
Config
CLI
Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
INTERFACE
FastEthernet0/0
FastEthernet1/0
Serial2/0
Serial3/0
FastEthernet4/0
FastEthernet5/0
Serial2/0
Port Status
On
Duplex
Full Duplex
Clock Rate
1200
IP Configuration
IPv4 Address
20.20.20.2
Subnet Mask
255.0.0.0
Tx Ring Limit
10
Equivalent IOS Commands
Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface Serial2/0
Router(config-if)#ip address 20.20.20.2 255.0.0.0
Router(config-if)#ip address 20.20.20.2 255.0.0.0
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface Serial2/0, changed state to up
Top
Type here to search
ENG
19:52
03-12-2023


Router0
Physical
Config
CLI
Attributes
IOS Command Line Interface
--- System Configuration Dialog ---
Would you like to enter the initial configuration dialog? [yes/no]:
Press RETURN to get started!
Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface Serial2/0
Router(config-if)#ip address 10.10.10.1 255.0.0.0
Router(config-if)#ip address 10.10.10.1 255.0.0.0
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface Serial2/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
Router(config-if)#exit
Router(config)#iterface loopback 0
% Invalid input detected at '^' marker.
Router(config)#interface loopback 0
Router(config-if)#
%LINK-5-CHANGED: Interface Loopback0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback0, changed state to up
Router(config-if)#ip address 200.200.200.1 255.255.255.0
Router(config-if)#exit
Router(config)#router bgp 100
Router(config-router)#bgp router-id 1.1.1.1
Router(config-router)#exit
Router(config)#
Copy
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Top
Type here to search
ENG
19:58
03-12-2023

Router2

Physical Config CLI Attributes

IOS Command Line Interface

```
Press RETURN to get started!



Press RETURN to get started!



Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#interface Serial2/0
Router(config-if)#ip address 10.10.10.2 255.0.0.0
Router(config-if)#ip address 10.10.10.2 255.0.0.0
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface Serial2/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up

Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial3/0
Router(config-if)#ip address 20.20.20.1 255.0.0.0
Router(config-if)#ip address 20.20.20.1 255.0.0.0
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface Serial3/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/0, changed state to up

Router(config-if)#exit
Router(config)#router bgp 300
Router(config-router)#bgp router-id 3.3.3.3
Router(config-router)#exit
Router(config)#
```

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Top

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ENG 19:59 03-12-2023

Router1

Physical Config CLI Attributes

IOS Command Line Interface

```
.
Processor board ID PT0123 (0123)
PT2005 processor: part number 0, mask 01
Bridging software.
X.25 software, Version 3.0.0.
4 FastEthernet/IEEE 802.3 interface(s)
2 Low-speed serial(sync/async) network interface(s)
32K bytes of non-volatile configuration memory.
63488K bytes of ATA CompactFlash (Read/Write)


         --- System Configuration Dialog ---

Would you like to enter the initial configuration dialog? [yes/no]:

Press RETURN to get started!



Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#interface Serial2/0
Router(config-if)#ip address 20.20.20.2 255.0.0.0
Router(config-if)#ip address 20.20.20.2 255.0.0.0
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface Serial2/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up

Router(config-if)#
Router(config-if)#exit
Router(config)#router bgp 200
Router(config-router)#bgp router-id 2.2.2.2
Router(config-router)#exit
Router(config)#
```

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Router0

Physical Config CLI Attributes

IOS Command Line Interface

```
Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#interface Serial2/0
Router(config-if)#ip address 10.10.10.1 255.0.0.0
Router(config-if)#ip address 10.10.10.1 255.0.0.0
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface Serial2/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up

Router(config-if)#exit
Router(config)#iterface loopback 0
                 ^
% Invalid input detected at '^' marker.

Router(config)#interface loopback 0

Router(config-if)#
%LINK-5-CHANGED: Interface Loopback0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback0, changed state to up

Router(config-if)#ip address 200.200.200.1 255.255.255.0
Router(config-if)#exit
Router(config)#router bgp 100
Router(config-router)#bgp router-id 1.1.1.1
Router(config-router)#exit
Router(config)#router bgp 100
Router(config-router)#neighbor 10.10.10.2 remote-as 300
Router(config-router)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#
```

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Top

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ENG 20:04 03-12-2023

Router2

Physical Config CLI Attributes

IOS Command Line Interface

```
Router#
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#interface Serial2/0
Router(config-if)#ip address 10.10.10.2 255.0.0.0
Router(config-if)#ip address 10.10.10.2 255.0.0.0
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface Serial2/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up

Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial3/0
Router(config-if)#ip address 20.20.20.1 255.0.0.0
Router(config-if)#ip address 20.20.20.1 255.0.0.0
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface Serial3/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/0, changed state to up

Router(config-if)#exit
Router(config)#router bgp 300
Router(config-router)#bgp router-id 3.3.3.3
Router(config-router)#exit
Router(config)#router bgp 300
Router(config-router)#neighbor 10.10.10.1 remote-as 100
Router(config-router)#%BGP-5-ADJCHANGE: neighbor 10.10.10.1 Up

Router(config-router)#neighbor 20.20.20.2 remote-as 200
Router(config-router)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#
```

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Top

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ENG 20:07 03-12-2023

Router1

Physical Config CLI Attributes

IOS Command Line Interface

```
4 FastEthernet/IEEE 802.3 interface(s)
2 Low-speed serial(sync/async) network interface(s)
32K bytes of non-volatile configuration memory.
63488K bytes of ATA CompactFlash (Read/Write)


        --- System Configuration Dialog ---

Would you like to enter the initial configuration dialog? [yes/no]:

Press RETURN to get started!



Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#interface Serial2/0
Router(config-if)#ip address 20.20.20.2 255.0.0.0
Router(config-if)#ip address 20.20.20.2 255.0.0.0
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface Serial2/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up

Router(config-if)#
Router(config-if)#exit
Router(config)#router bgp 200
Router(config-router)#bgp router-id 2.2.2.2
Router(config-router)#exit
Router(config)#router bgp 200
Router(config-router)#neighbor 20.20.20.1 remote-as 300
Router(config-router)#%BGP-5-ADJCHANGE: neighbor 20.20.20.1 Up

Router(config-router)#exit
Router(config)#
```

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Top

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Router0

Physical Config CLI Attributes

IOS Command Line Interface

```
Router(config-if)#ip address 10.10.10.1 255.0.0.0
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface Serial2/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up

Router(config-if)#exit
Router(config)#iterface loopback 0
                ^
% Invalid input detected at '^' marker.

Router(config)#interface loopback 0

Router(config-if)#
%LINK-5-CHANGED: Interface Loopback0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback0, changed state to up

Router(config-if)#ip address 200.200.200.1 255.255.255.0
Router(config-if)#exit
Router(config)#router bgp 100
Router(config-router)#bgp router-id 1.1.1.1
Router(config-router)#exit
Router(config)#router bgp 100
Router(config-router)#neighbor 10.10.10.2 remote-as 300
Router(config-router)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#%BGP-5-ADJCHANGE: neighbor 10.10.10.2 Up

Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#router bgp 100
Router(config-router)#network 200.200.200.0 mask 255.255.255.0
Router(config-router)#
```

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Top

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```
Router#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, Serial2/0
C    200.200.200.0/24 is directly connected, Loopback0

Router#
```

```
Router#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, Serial2/0
C    20.0.0.0/8 is directly connected, Serial3/0
B    200.200.200.0/24 [20/0] via 10.10.10.1, 00:00:00

Router#
```

```
Router#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    20.0.0.0/8 is directly connected, Serial2/0
B    200.200.200.0/24 [20/0] via 20.20.20.1, 00:00:00

Router#
```