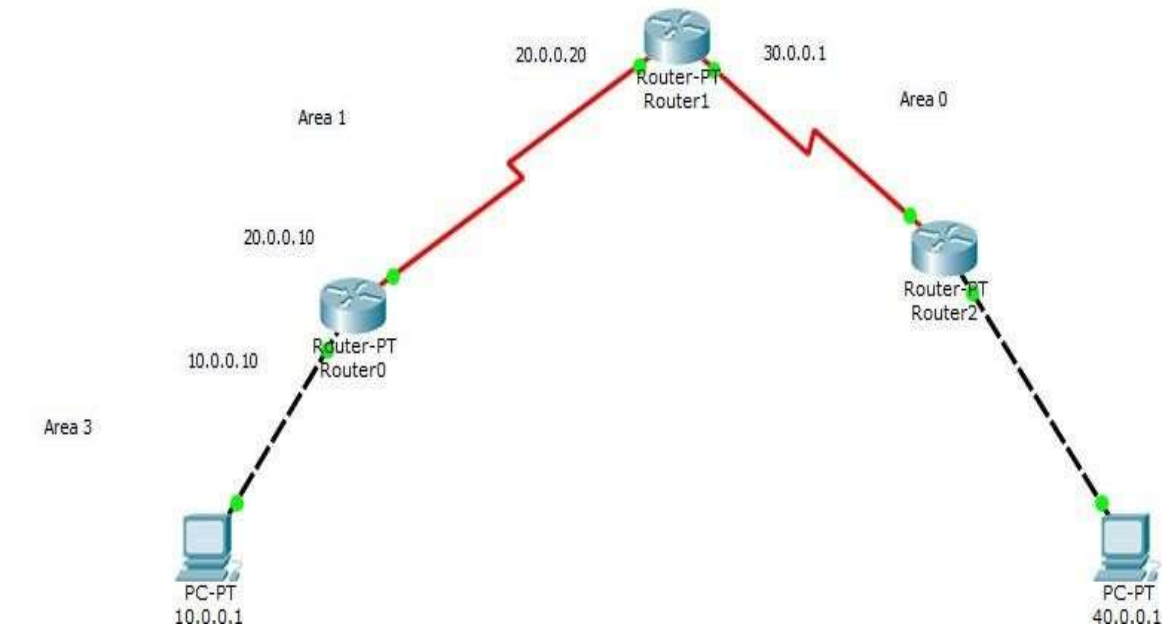
CN LAB-06(a) (04/08/2023)

USN:1BM21CS271

Demonstrate OSPF protocol in routers.

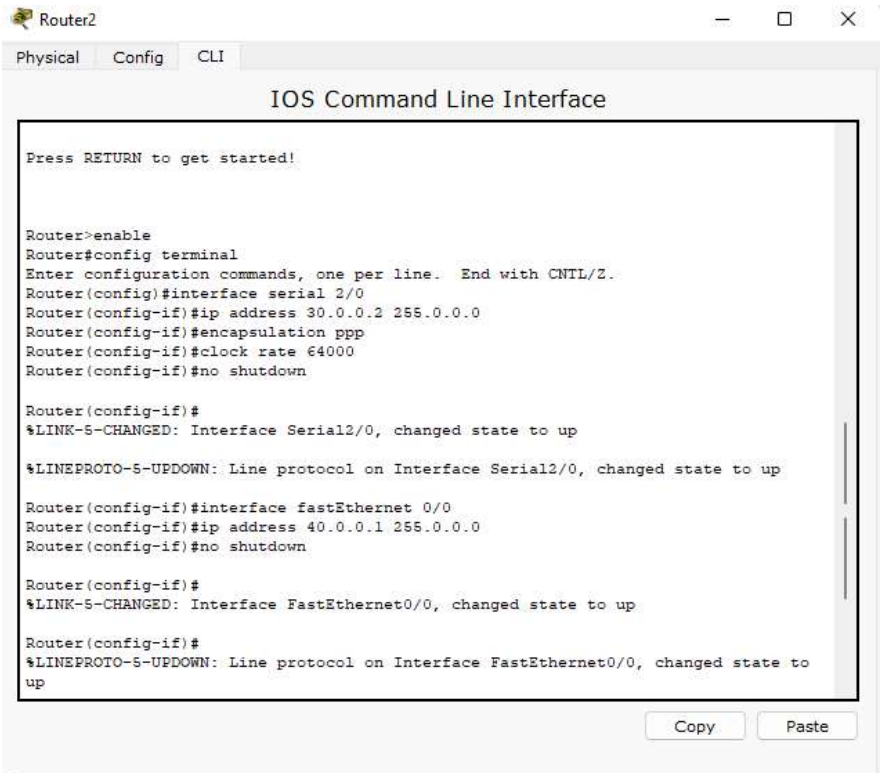
TOPOLOGY:

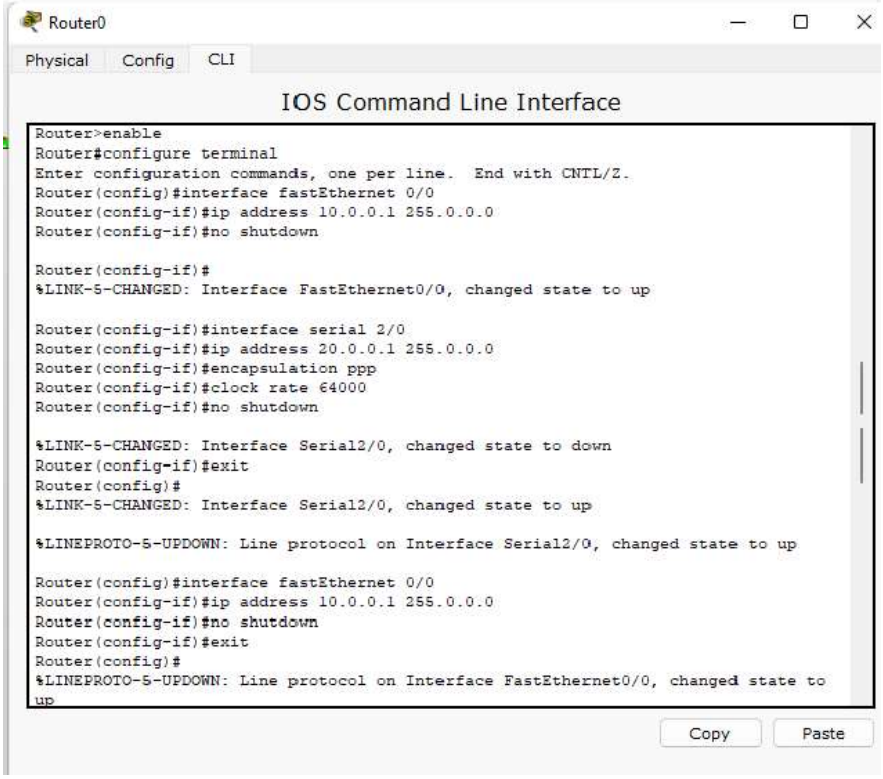


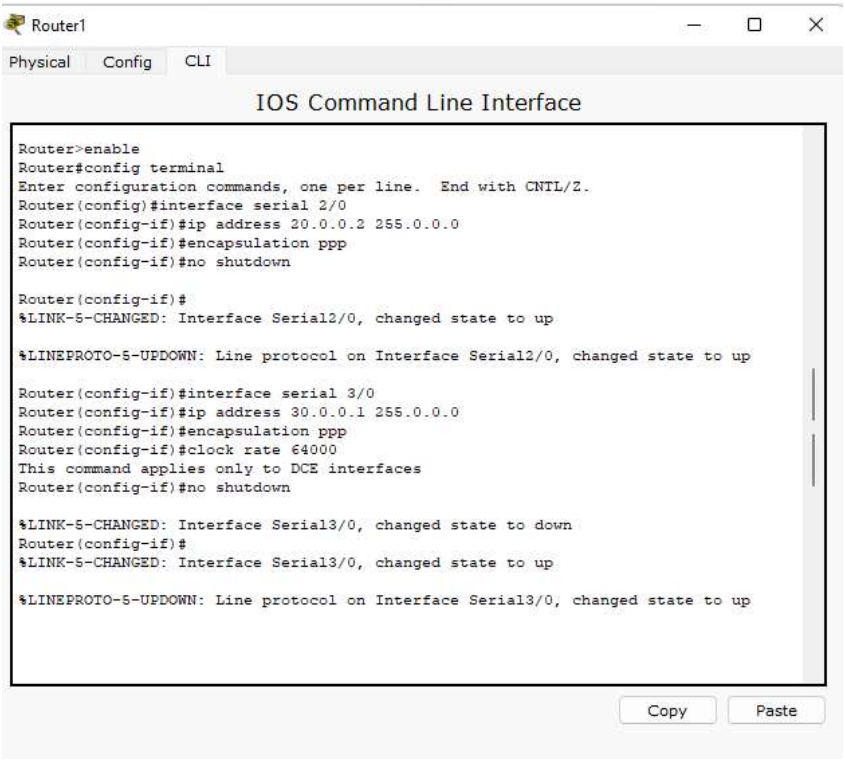
1. Configure ip addresses to all interfaces:

(serial-router to router, fastEthernet-router to end device)

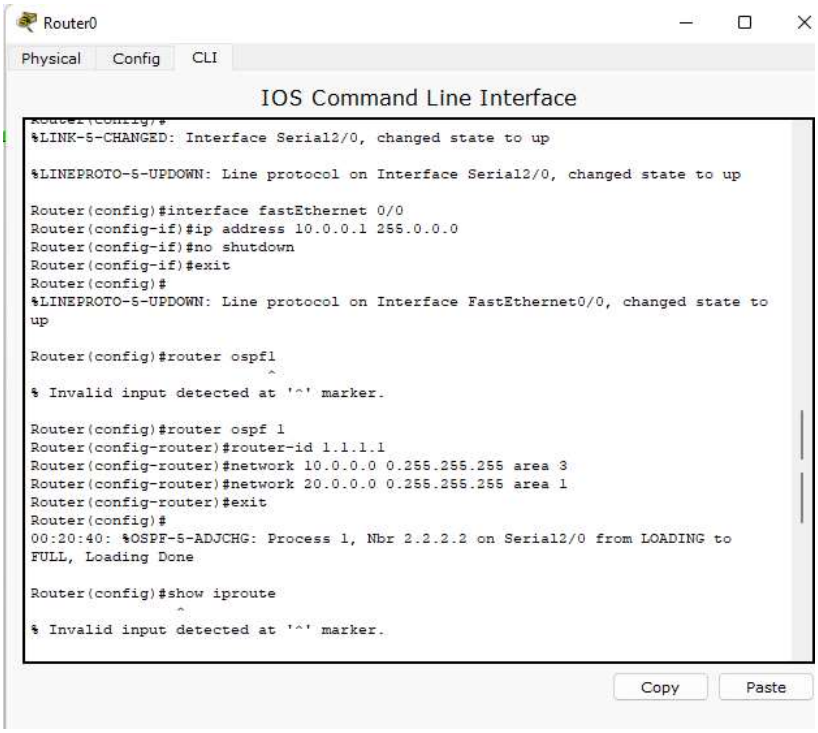
(similar to RIP exp)







2. Enable ip routing by configuring OSPF in all routers:



Router1

Physical Config CLI

IOS Command Line Interface

```
2outer>enable
2outer#con¥ig terminal
3nter configuration commands. one per line. 3nd with CWTL/Z.

2outerlconIig-router)#router-id ? ?.?.?

2outer|con¥ig-router)#network
00:?0:38: %OSPF-S-ADJCHG: Process l, Nbr l.l.l.l on Serial?/U from LOADING to
FULL, Loading Done

% Incomplete comosnd.

2outer lcon ¥ig-router)#exit
2outerlcon€igl4
00:?l:S7: %OSPF-S-ADJCHG: Process l, Nbr 3.3.3.3 on Serial3/U from LOADING to
FULL, Loading Done
```

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Router2

Physical Config CLI

I OS Command L i ne Interface

```
Router(config-if)#
%LINR-S-CHANGED: Interface Serial?/1. changed state to up

BLINEPAOTO-S-UPODlTN: Line protocol on Interface Serial?/0, changed state to up

2outerlcon€ig-i€l#inter€ace €ast3thernet 0/0
Aouterlcon€ig-ifl#ip address 40.1.0.1 ?SS.0.0.0
Aouterl con€ig-i€l #no shutdown

2outerlcon€ig-ifl4
%LINR-S-CHANGED: Interface Fast3thernet0/0. changed state to up

Aouterlcon€ig-i€)#
%LINEP2OIO-S-UPDOWW: Line protocol on Interface Fast3themet0/0, changed state to

Router(config-if)#exit
2outerlcon€igl4router ospf l
Aouterlcon€ig-router)4router-id 3.3.3.3
Aouterlcon¥ig-router)#
Aouterlcon€ig-router)#network 30.0.0.0 0.?SS.?SS.?SS area 0
2outerlcon€ig-router)#net
10:?l:S4: %OSPF-S-ADJCHG: Process l, Nbr ?.?.?.? on Serial?/1 from LOADING to
FULL. Loading Done

2outerlcon€ig-router)#network 40.0.1.0 0.?SS.?SS.?SS area ?
Aouterl con€ig-router)4exit
Aouterlcon¥igl#
```

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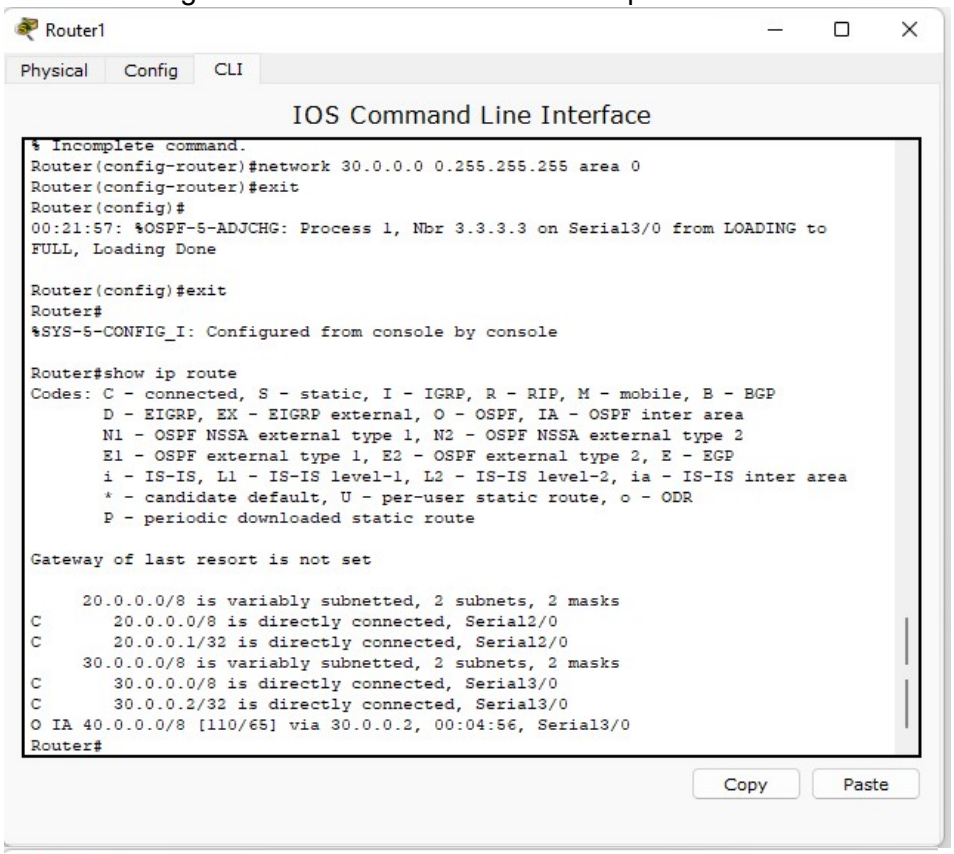
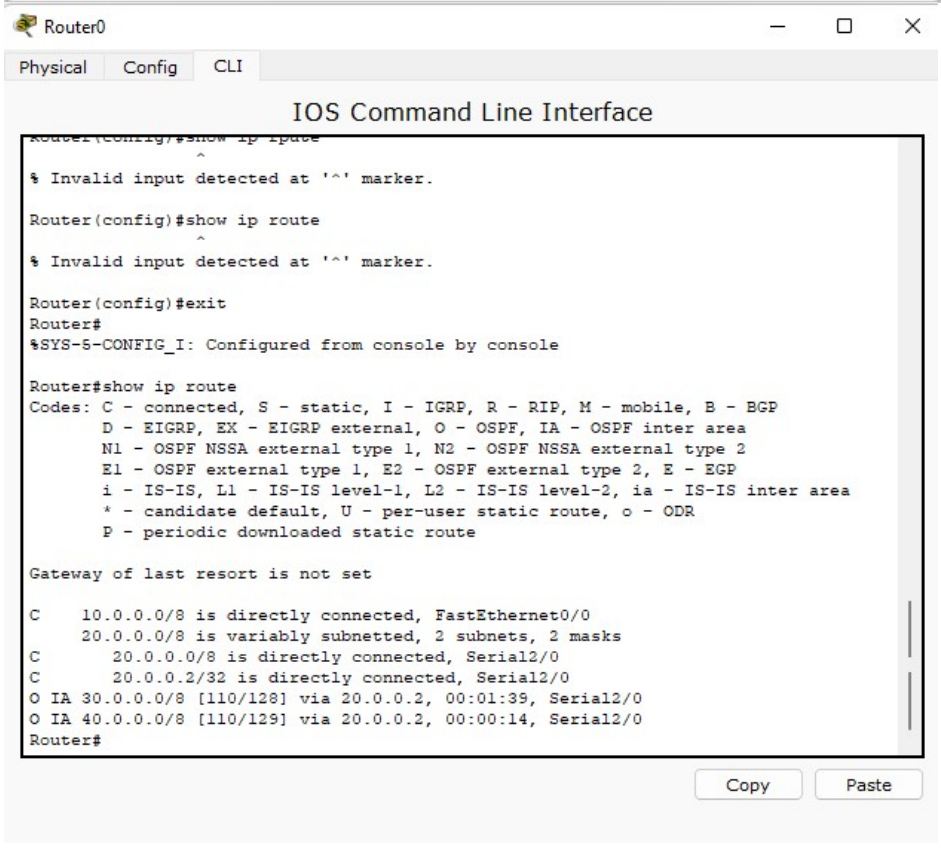
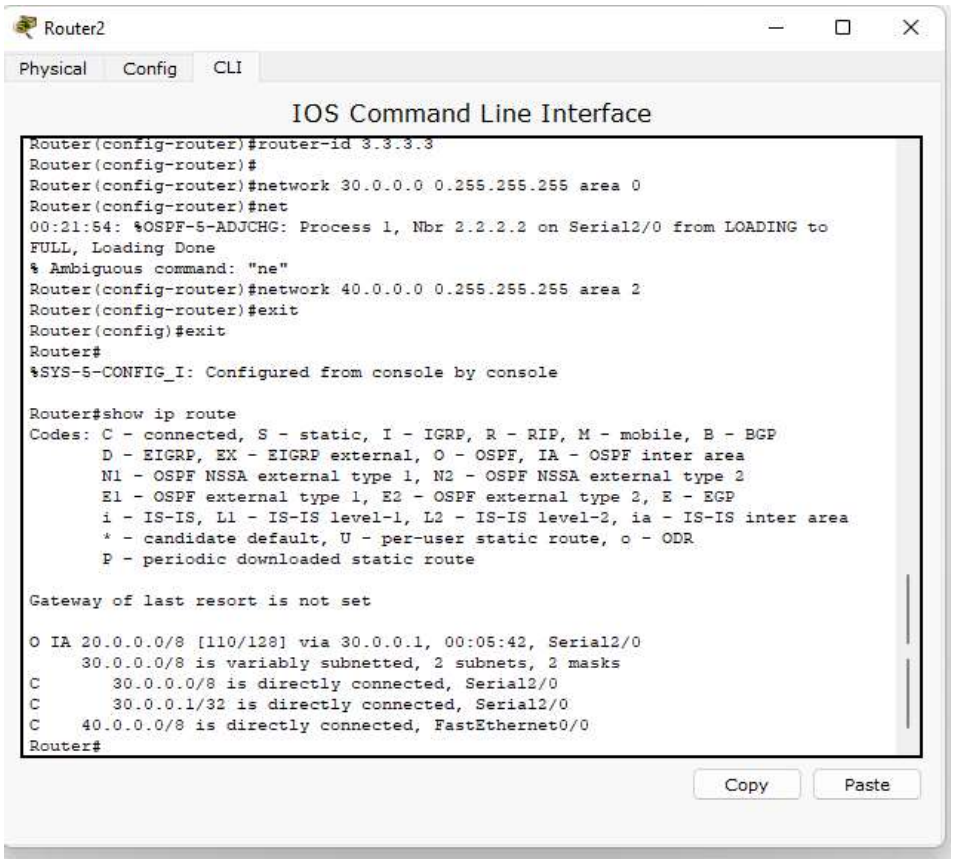
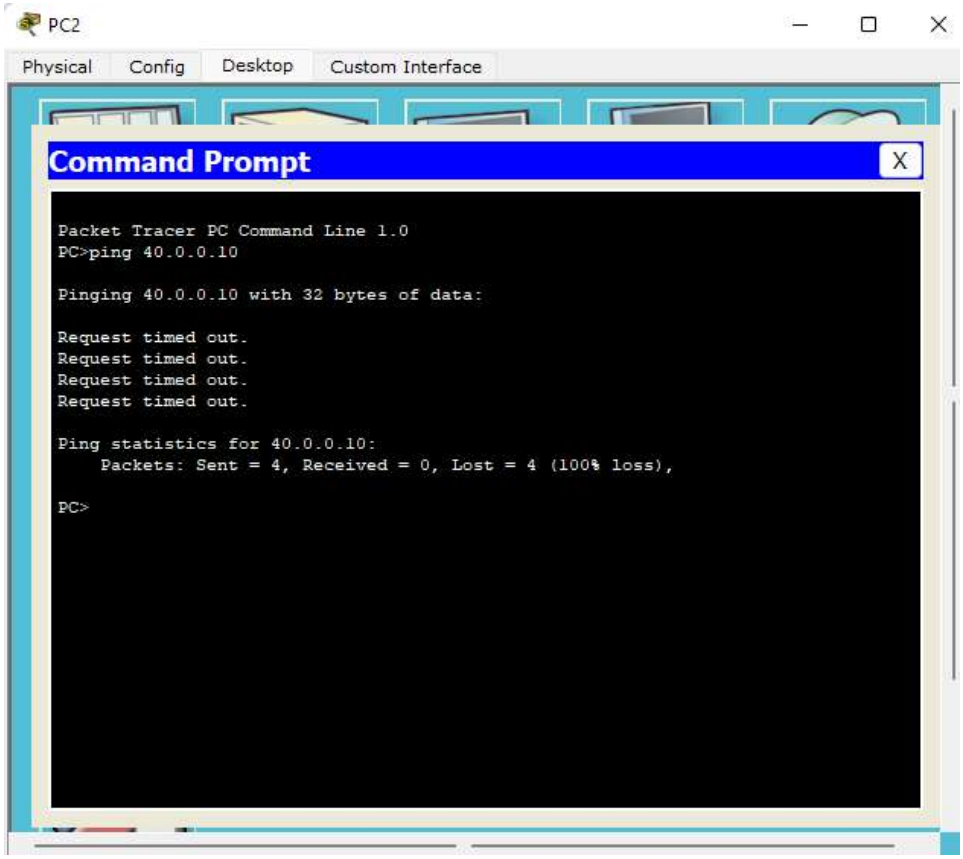
3. Show routing table for all three routers #show ip route







4. Ping from end device to other end device



5. Create dedicated loopback interface for all the routers

Router1

Physical Config CLI

IOS Command Line Interface

```
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

     20.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C       20.0.0.0/8 is directly connected, Serial2/0
C       20.0.0.1/32 is directly connected, Serial2/0
     30.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C       30.0.0.0/8 is directly connected, Serial3/0
C       30.0.0.2/32 is directly connected, Serial3/0
O IA 40.0.0.0/8 [110/65] via 30.0.0.2, 00:04:56, Serial3/0
Router#config terminal
Enter configuration commands, one per line.  End with CNTL/Z.
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
ip add 172.16.1.253 255.255.0.0
Router(config-if)#no shutdown
Router(config-if)#
```

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Router0

Physical Config CLI

IOS Command Line Interface

```
       P - periodic downloaded static route

Gateway of last resort is not set

C    10.0.0.0/8 is directly connected, FastEthernet0/0
     20.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C       20.0.0.0/8 is directly connected, Serial2/0
C       20.0.0.2/32 is directly connected, Serial2/0
O IA 30.0.0.0/8 [110/128] via 20.0.0.2, 00:01:39, Serial2/0
O IA 40.0.0.0/8 [110/129] via 20.0.0.2, 00:00:14, Serial2/0
Router#config terminal
Enter configuration commands, one per line.  End with CNTL/Z.
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 add 172.16.1.252 255.255.255.0.0
                                    ^
% Invalid input detected at '^' marker.

Router(config-if)#ip add 172.16.1.252 255.255.0.0
Router(config-if)#no shutdown'
                             ^
% Invalid input detected at '^' marker.

Router(config-if)#no shutdown
Router(config-if)#
```

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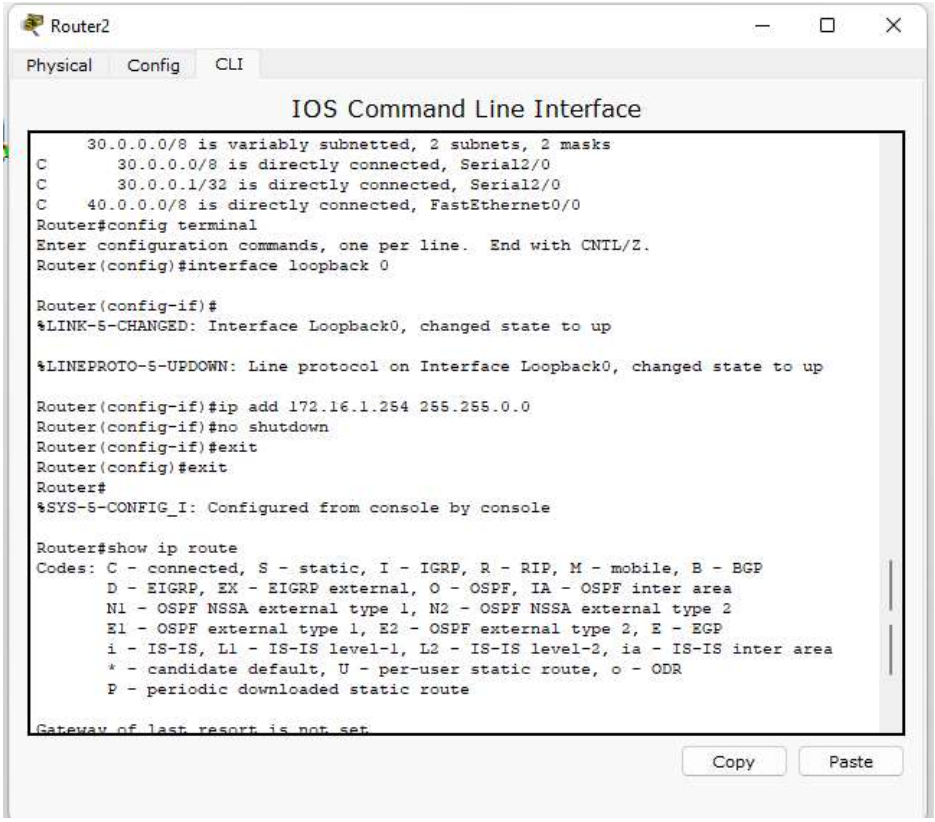
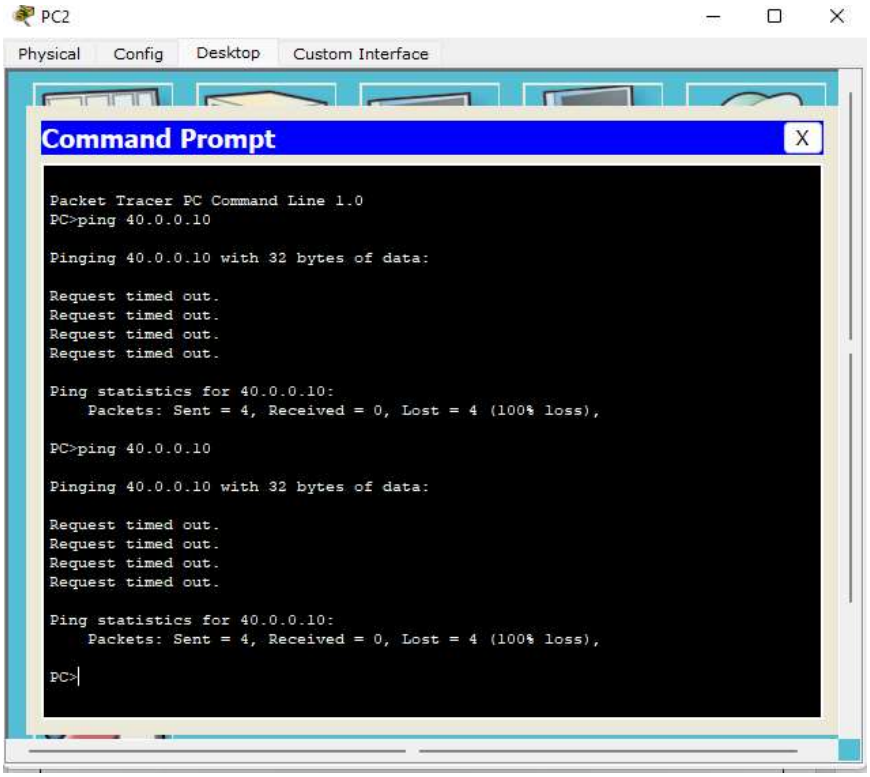
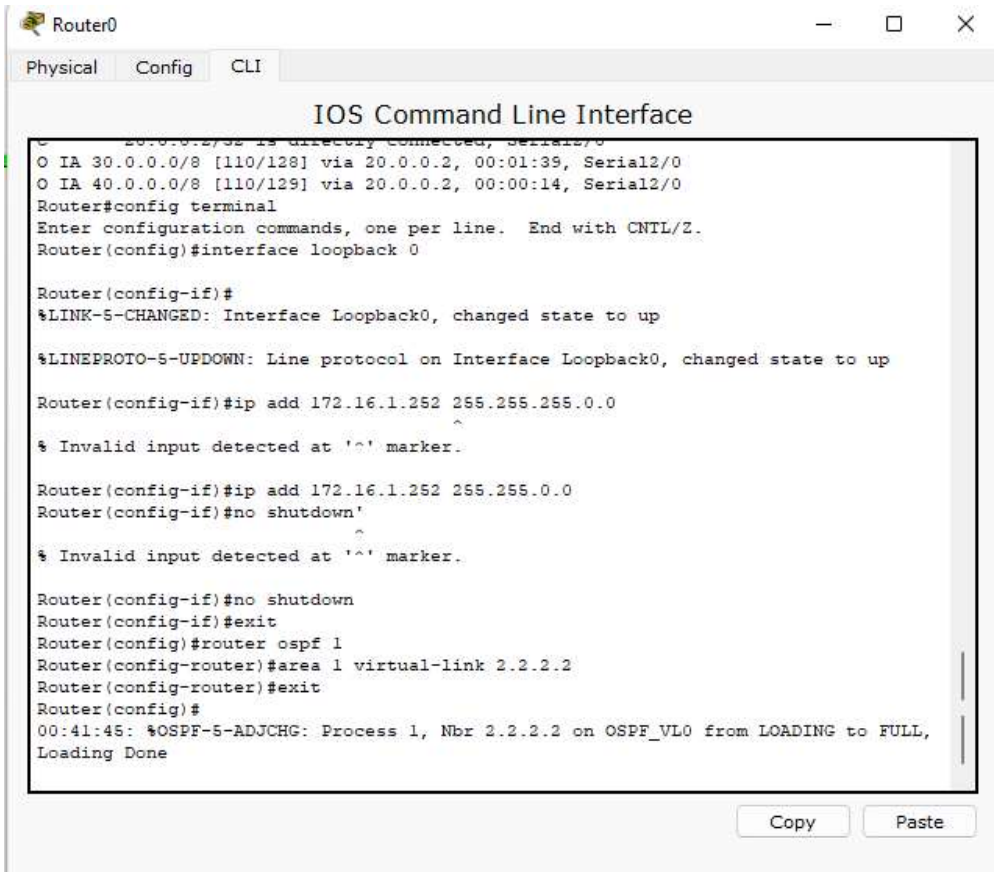
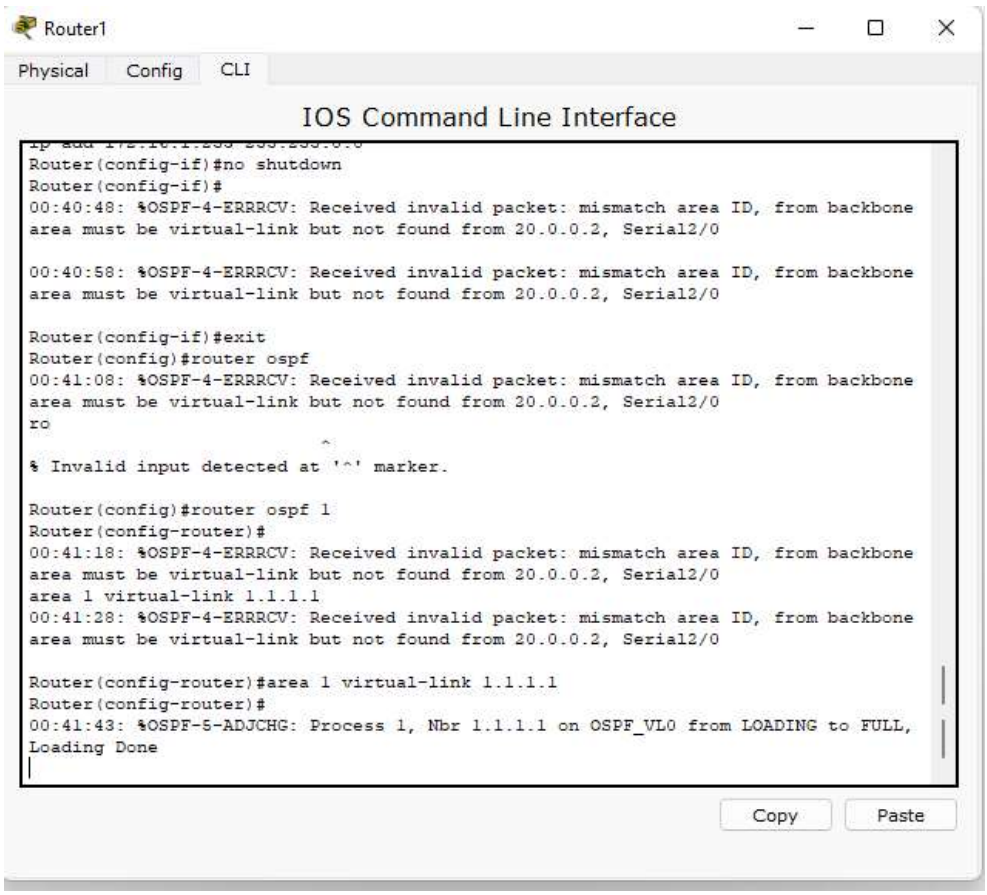


6. Ping from end device to other end device



7. Create a virtual link (CLI of first two routers) to connect area 3 to area 0.





8. Final Output(ping from 10.0.0.10 to 40.0.0.10):