VIT-AP UNIVERSITY, ANDHRA PRADESH

CSE3003 – Computer Networks - Lab Sheet: 6

Academic year: 2023-2024 **Branch/ Class:** B.Tech
Semester: Fall **Date:**
Faculty Name: Prof. S.Gopikrishnan **School:** SCOPE
Student name:22BCE7224 **Reg. no.: 22BCE7224**

LAB 6

1. Design a network using fixed length Subnetting for a class C Ipv4 address and configure it in Router.

   192.168.10.0/28

   a) Mention the subnet masks of the above-mentioned IP Addresses
   Ans. 255.255.255.240
   b) Find the total number of subnets for each ip addresses
   Ans. 2^4=16
   c) Find the total number of hosts that can be configured.
   Ans. 2^(32 - 28) - 2 = 2^4 - 2 = 14 hosts per subnet.
   d) Find out the broadcast ID for each of the IP addresses

   Objectives:

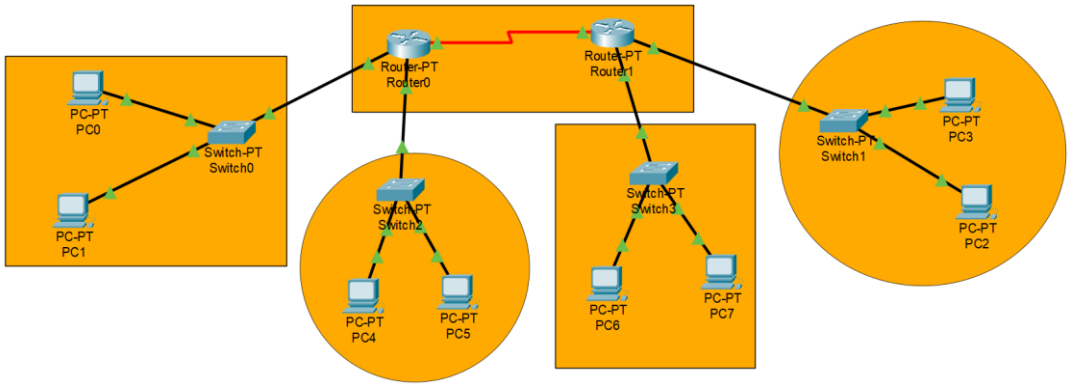
   a) Design the above network with packet tracer.
   b) Each subnet should have two PCs (one for starting address and one using ending address.
   c) Configure first 4 subnet as single network as below.
   d) Show output of router config, pc's ip config and success message.

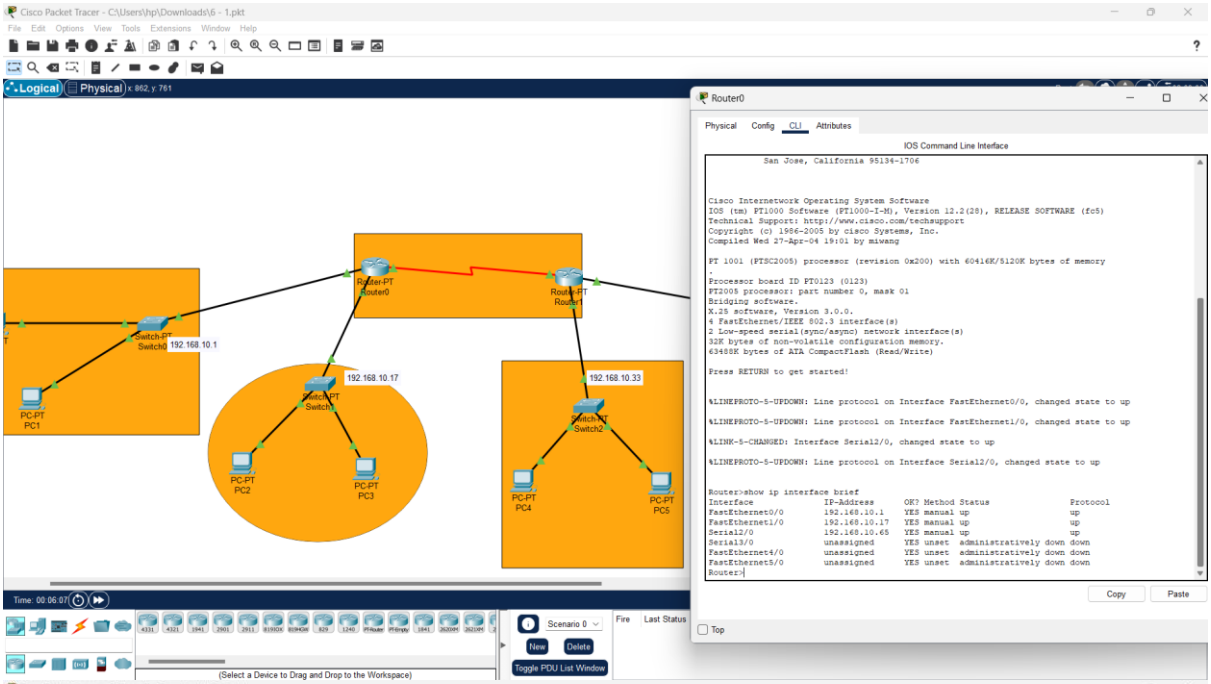
```
Router#show ip interface brief
Interface              IP-Address      OK? Method Status                Protocol
FastEthernet0/0        192.168.1.97    YES manual up                    up
FastEthernet1/0        192.168.1.129   YES manual up                    up
Serial2/0              192.168.1.66    YES manual up                    up
Serial3/0              unassigned      YES unset  administratively down down
FastEthernet4/0        unassigned      YES unset  administratively down down
FastEthernet5/0        unassigned      YES unset  administratively down down
Router#
```

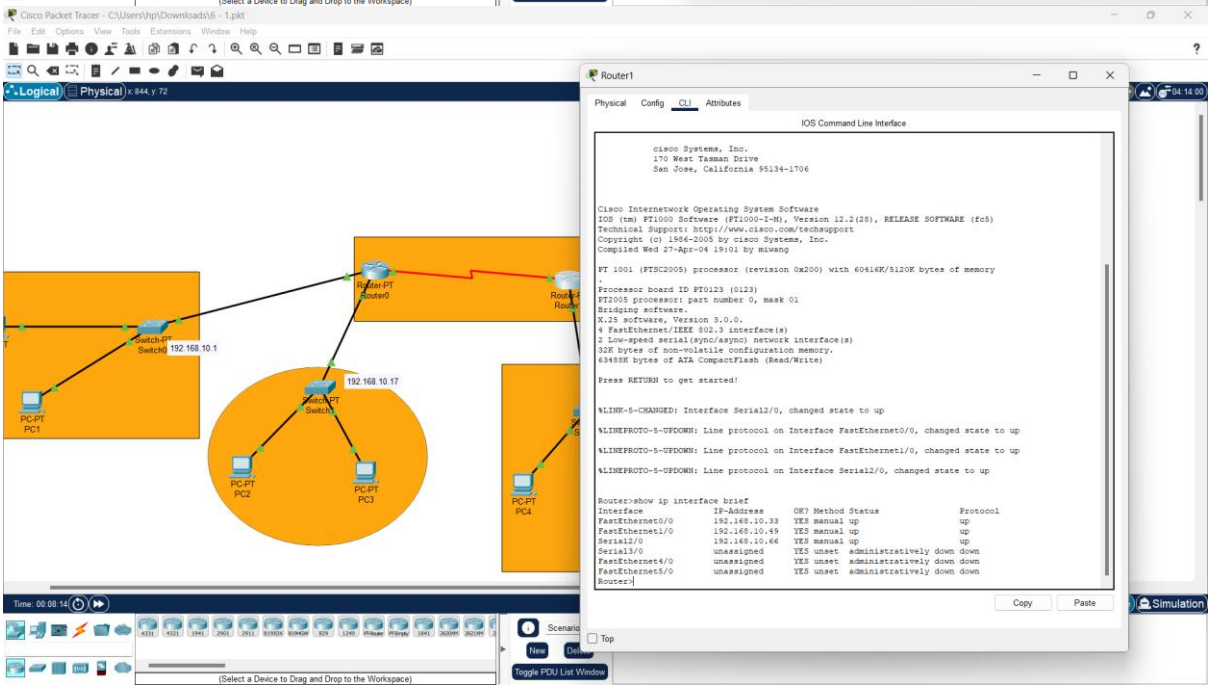
```
C:\>ipconfig

FastEthernet0 Connection:(default port)

   Connection-specific DNS Suffix..:
   Link-local IPv6 Address.....: FE80::205:5EFF:FEA3:D4C8
   IPv6 Address.....: ::
   IPv4 Address.....: 192.168.1.36
   Subnet Mask.....: 255.255.255.224
   Default Gateway.....: ::
                                 192.168.1.33
```


Router-PT
Router0
Router-PT
Router1
PC-PT
PC0
Switch-PT
Switch0
PC-PT
PC1
Switch-PT
Switch2
PC-PT
PC4
PC-PT
PC5
Switch-PT
Switch3
PC-PT
PC6
PC-PT
PC7
Switch-PT
Switch1
PC-PT
PC3
PC-PT
PC2


Cisco Packet Tracer - C:\Users\hp\Downloads\6 - 1.pkt
Logical
Physical
Router0
Physical
Config
CLI
Attributes
IOS Command Line Interface
San Jose, California 95134-1706
Cisco Internetwork Operating System Software
IOS (tm) PT1000 Software (PT1000-I-M), Version 12.2(28), RELEASE SOFTWARE (fc5)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2005 by cisco Systems, Inc.
Compiled Wed 27-Apr-04 19:01 by miwang
FT 1001 (PTSC2005) processor (revision 0x200) with 60416K/5120K bytes of memory
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)
Press RETURN to get started!
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet1/0, changed state to up
%LINK-5-CHANGED: Interface Serial2/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
Router>show ip interface brief
Interface IP-Address OK? Method Status Protocol
FastEthernet0/0 192.168.10.1 YES manual up up
FastEthernet1/0 192.168.10.17 YES manual up up
Serial2/0 192.168.10.65 YES manual up up
Serial3/0 unassigned YES unset administratively down down
FastEthernet4/0 unassigned YES unset administratively down down
FastEthernet5/0 unassigned YES unset administratively down down
Router>
Copy
Paste
Top
192.168.10.1
192.168.10.17
192.168.10.33
PC-PT PC1
PC-PT PC2
PC-PT PC3
PC-PT PC4
PC-PT PC5
Time: 00:06:07
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
(Select a Device to Drag and Drop to the Workspace)


Cisco Packet Tracer - C:\Users\hp\Downloads\6 - 1.pkt
Logical
Physical
Router1
Physical
Config
CLI
Attributes
IOS Command Line Interface
cisco Systems, Inc.
170 West Tasman Drive
San Jose, California 95134-1706
Cisco Internetwork Operating System Software
IOS (tm) PT1000 Software (PT1000-I-M), Version 12.2(28), RELEASE SOFTWARE (fc5)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2005 by cisco Systems, Inc.
Compiled Wed 27-Apr-04 19:01 by miwang
FT 1001 (PTSC2005) processor (revision 0x200) with 60416K/5120K bytes of memory
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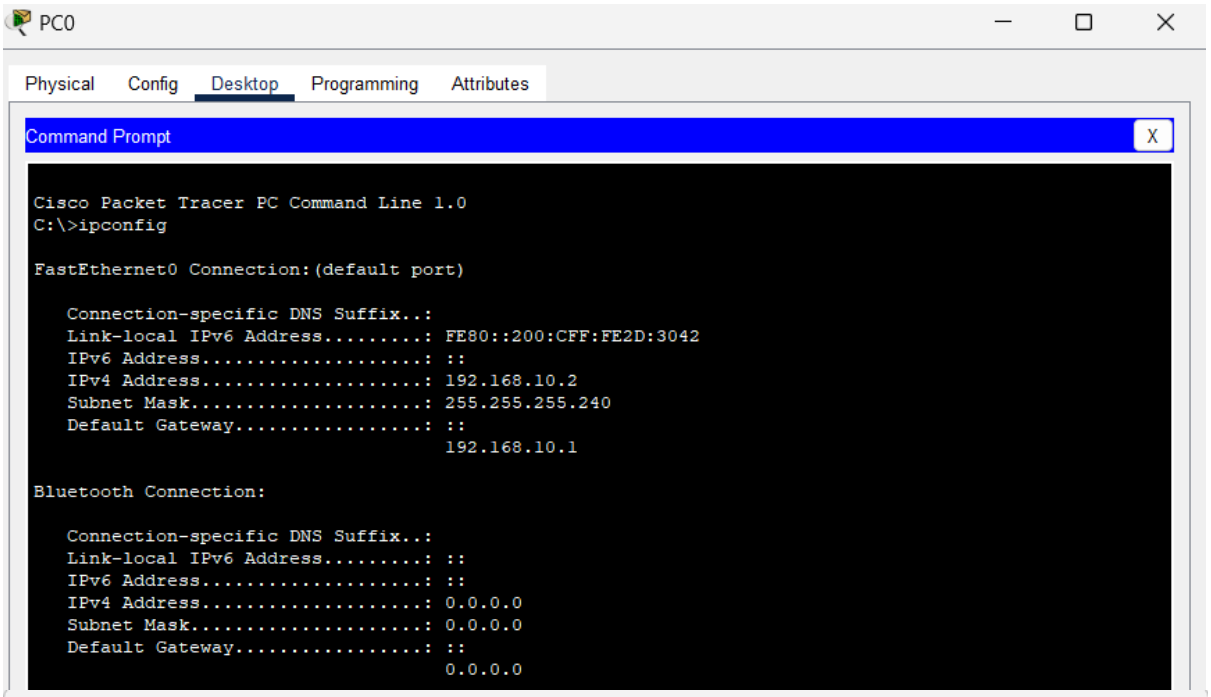
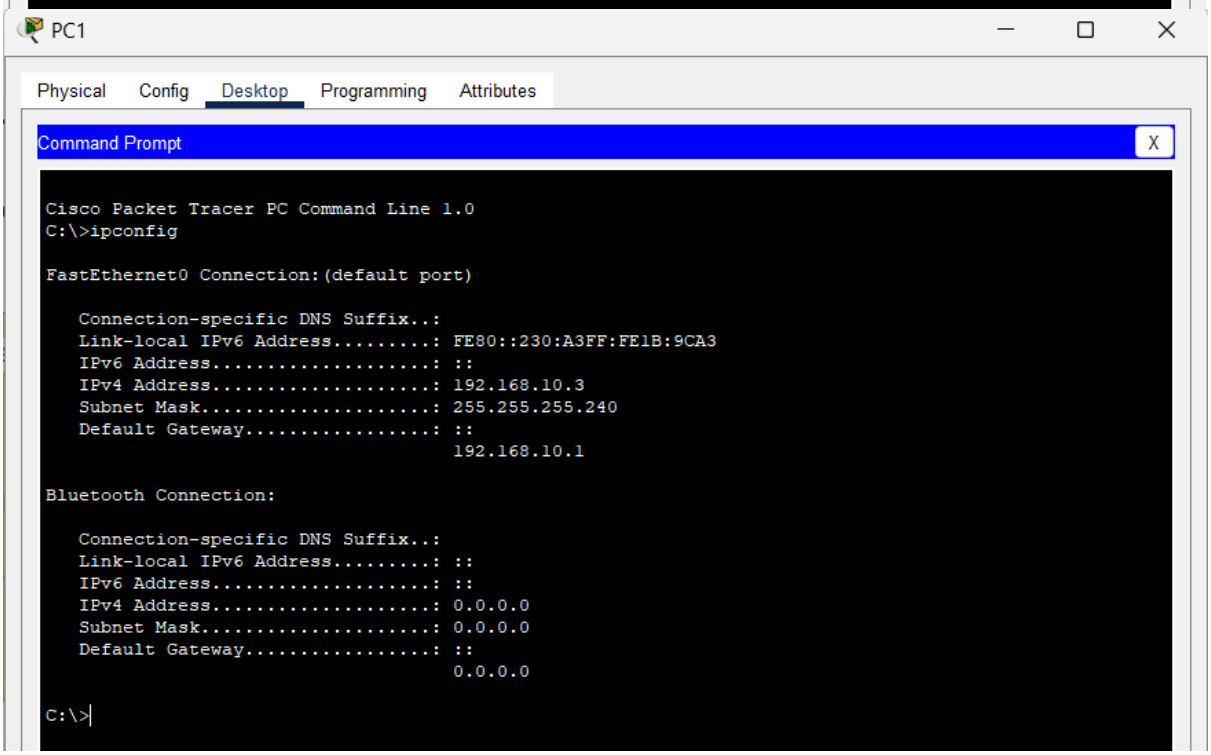
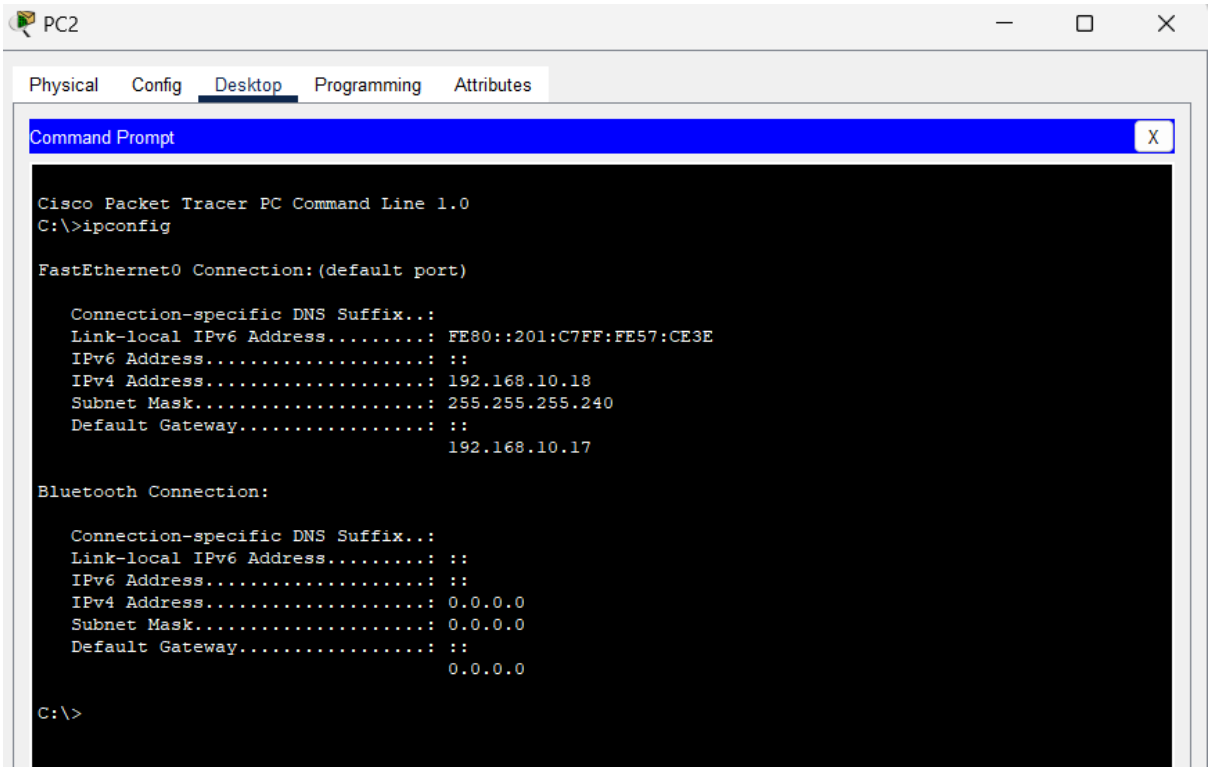
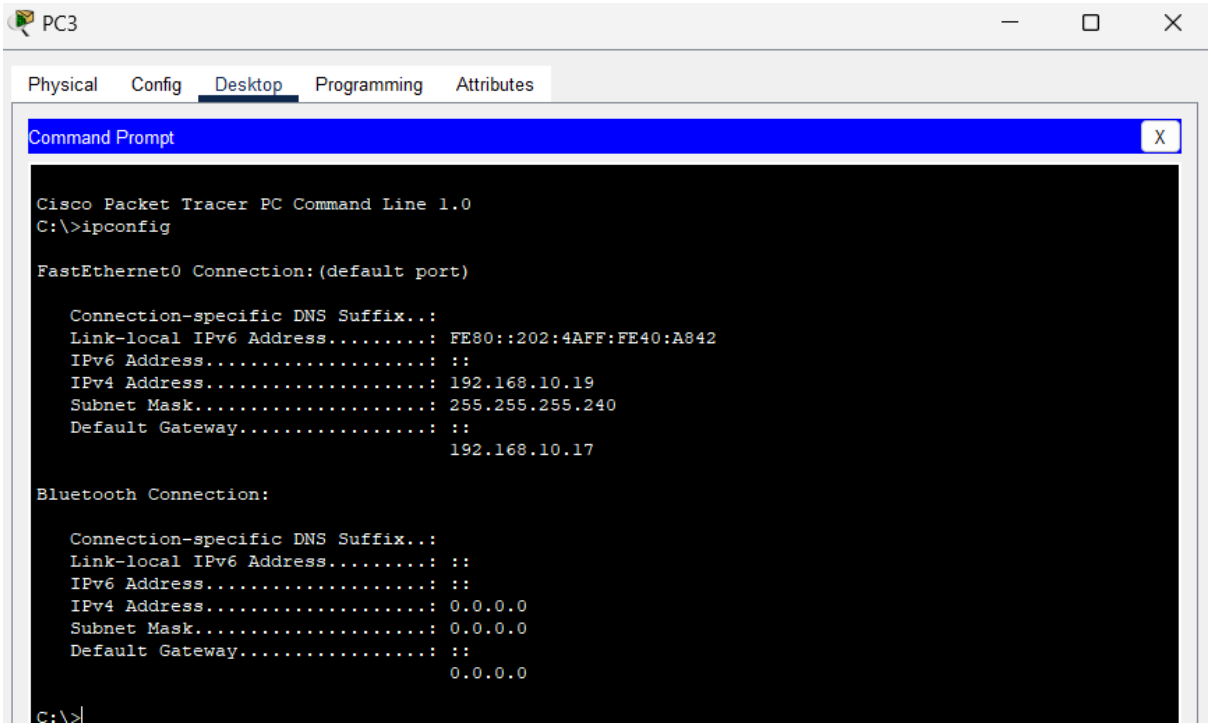
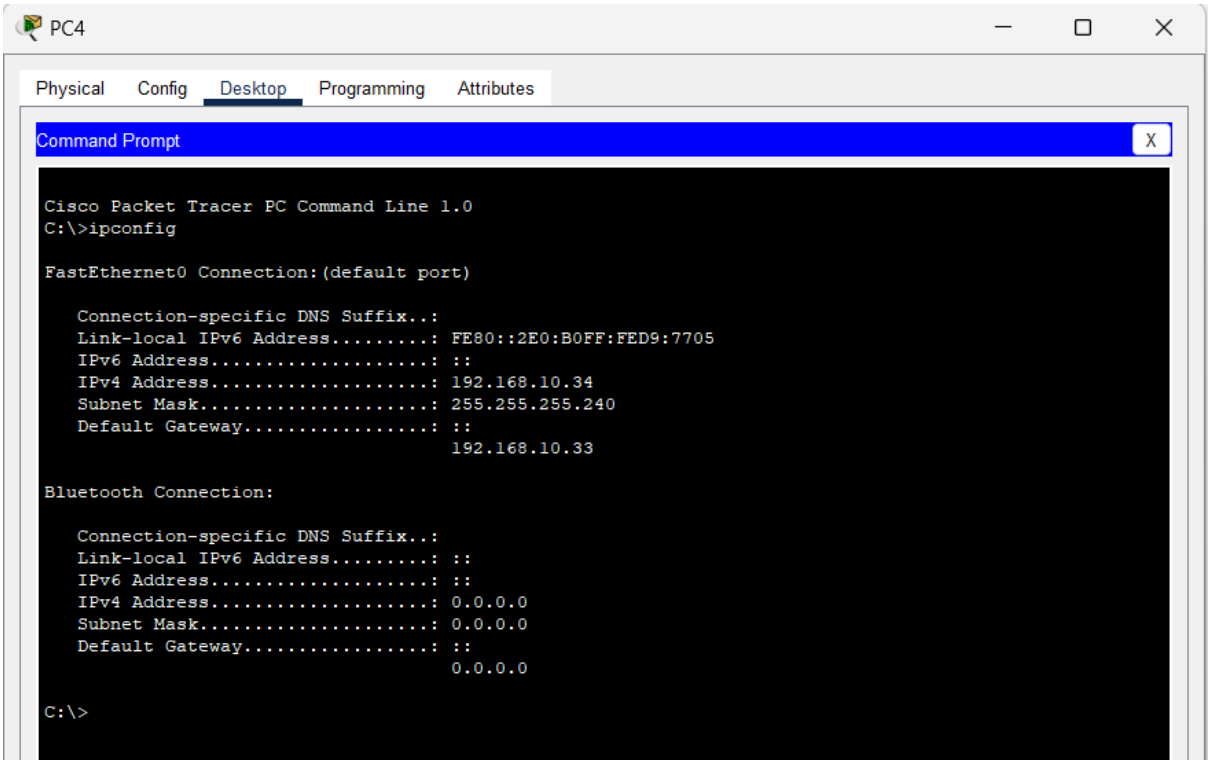
4 FastEthernet/IEEE 802.3 interface(s)
2 Low-speed serial(sync/async) network interface(s)
32K bytes of non-volatile configuration memory.
63488K bytes of ATA CompactFlash (Read/Write)
Press RETURN to get started!
%LINK-5-CHANGED: Interface Serial2/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet1/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
Router>show ip interface brief
Interface IP-Address OK? Method Status Protocol
FastEthernet0/0 192.168.10.33 YES manual up up
FastEthernet1/0 192.168.10.49 YES manual up up
Serial2/0 192.168.10.66 YES manual up up
Serial3/0 unassigned YES unset administratively down down
FastEthernet4/0 unassigned YES unset administratively down down
FastEthernet5/0 unassigned YES unset administratively down down
Router>
Copy
Paste
Top
192.168.10.1
192.168.10.17
PC-PT PC1
PC-PT PC2
PC-PT PC3
PC-PT PC4
Time: 00:08:14
Simulation
New
Toggle PDU List Window
(Select a Device to Drag and Drop to the Workspace)

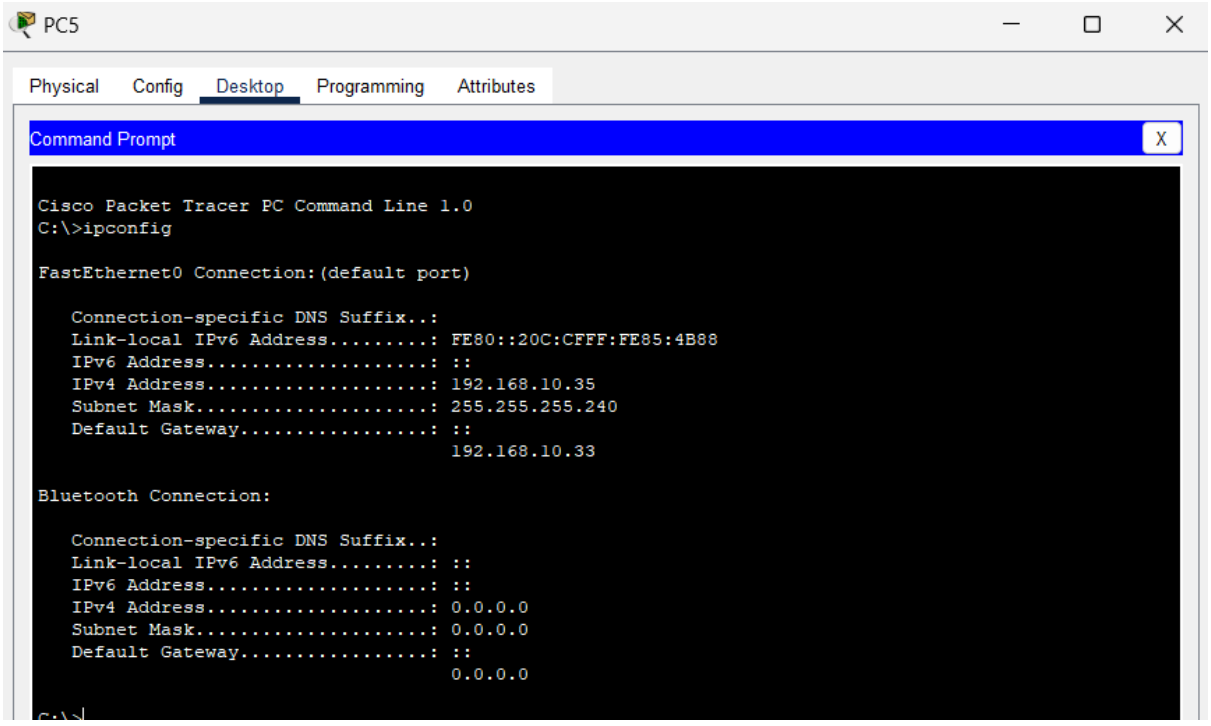

PC0
Physical
Config
Desktop
Programming
Attributes
Command Prompt
X
Cisco Packet Tracer PC Command Line 1.0
C:\>ipconfig
FastEthernet0 Connection:(default port)
Connection-specific DNS Suffix..:
Link-local IPv6 Address.....: FE80::200:CFF:FE2D:3042
IPv6 Address.....: ::
IPv4 Address.....: 192.168.10.2
Subnet Mask.....: 255.255.255.240
Default Gateway.....: ::
192.168.10.1
Bluetooth Connection:
Connection-specific DNS Suffix..:
Link-local IPv6 Address.....: ::
IPv6 Address.....: ::
IPv4 Address.....: 0.0.0.0
Subnet Mask.....: 0.0.0.0
Default Gateway.....: ::
0.0.0.0


PC1
Physical
Config
Desktop
Programming
Attributes
Command Prompt
X
Cisco Packet Tracer PC Command Line 1.0
C:\>ipconfig
FastEthernet0 Connection:(default port)
Connection-specific DNS Suffix..:
Link-local IPv6 Address.....: FE80::230:A3FF:FE1B:9CA3
IPv6 Address.....: ::
IPv4 Address.....: 192.168.10.3
Subnet Mask.....: 255.255.255.240
Default Gateway.....: ::
192.168.10.1
Bluetooth Connection:
Connection-specific DNS Suffix..:
Link-local IPv6 Address.....: ::
IPv6 Address.....: ::
IPv4 Address.....: 0.0.0.0
Subnet Mask.....: 0.0.0.0
Default Gateway.....: ::
0.0.0.0
C:\>


PC2
Physical
Config
Desktop
Programming
Attributes
Command Prompt
X
Cisco Packet Tracer PC Command Line 1.0
C:\>ipconfig
FastEthernet0 Connection:(default port)
Connection-specific DNS Suffix..:
Link-local IPv6 Address.....: FE80::201:C7FF:FE57:CE3E
IPv6 Address.....: ::
IPv4 Address.....: 192.168.10.18
Subnet Mask.....: 255.255.255.240
Default Gateway.....: ::
192.168.10.17
Bluetooth Connection:
Connection-specific DNS Suffix..:
Link-local IPv6 Address.....: ::
IPv6 Address.....: ::
IPv4 Address.....: 0.0.0.0
Subnet Mask.....: 0.0.0.0
Default Gateway.....: ::
0.0.0.0
C:\>


PC3
Physical
Config
Desktop
Programming
Attributes
Command Prompt
X
Cisco Packet Tracer PC Command Line 1.0
C:\>ipconfig
FastEthernet0 Connection:(default port)
Connection-specific DNS Suffix..:
Link-local IPv6 Address.....: FE80::202:4AFF:FE40:A842
IPv6 Address.....: ::
IPv4 Address.....: 192.168.10.19
Subnet Mask.....: 255.255.255.240
Default Gateway.....: ::
192.168.10.17
Bluetooth Connection:
Connection-specific DNS Suffix..:
Link-local IPv6 Address.....: ::
IPv6 Address.....: ::
IPv4 Address.....: 0.0.0.0
Subnet Mask.....: 0.0.0.0
Default Gateway.....: ::
0.0.0.0
C:\>


PC4
Physical
Config
Desktop
Programming
Attributes
Command Prompt
X
Cisco Packet Tracer PC Command Line 1.0
C:\>ipconfig
FastEthernet0 Connection:(default port)
Connection-specific DNS Suffix..:
Link-local IPv6 Address.....: FE80::2E0:B0FF:FED9:7705
IPv6 Address.....: ::
IPv4 Address.....: 192.168.10.34
Subnet Mask.....: 255.255.255.240
Default Gateway.....: ::
192.168.10.33
Bluetooth Connection:
Connection-specific DNS Suffix..:
Link-local IPv6 Address.....: ::
IPv6 Address.....: ::
IPv4 Address.....: 0.0.0.0
Subnet Mask.....: 0.0.0.0
Default Gateway.....: ::
0.0.0.0
C:\>


PC5
Physical
Config
Desktop
Programming
Attributes
Command Prompt
X
Cisco Packet Tracer PC Command Line 1.0
C:\>ipconfig
FastEthernet0 Connection:(default port)
Connection-specific DNS Suffix..:
Link-local IPv6 Address.....: FE80::20C:CFFF:FE85:4B88
IPv6 Address.....: ::
IPv4 Address.....: 192.168.10.35
Subnet Mask.....: 255.255.255.240
Default Gateway.....: ::
192.168.10.33
Bluetooth Connection:
Connection-specific DNS Suffix..:
Link-local IPv6 Address.....: ::
IPv6 Address.....: ::
IPv4 Address.....: 0.0.0.0
Subnet Mask.....: 0.0.0.0
Default Gateway.....: ::
0.0.0.0

PC6

Physical Config Desktop Programming Attributes

Command Prompt

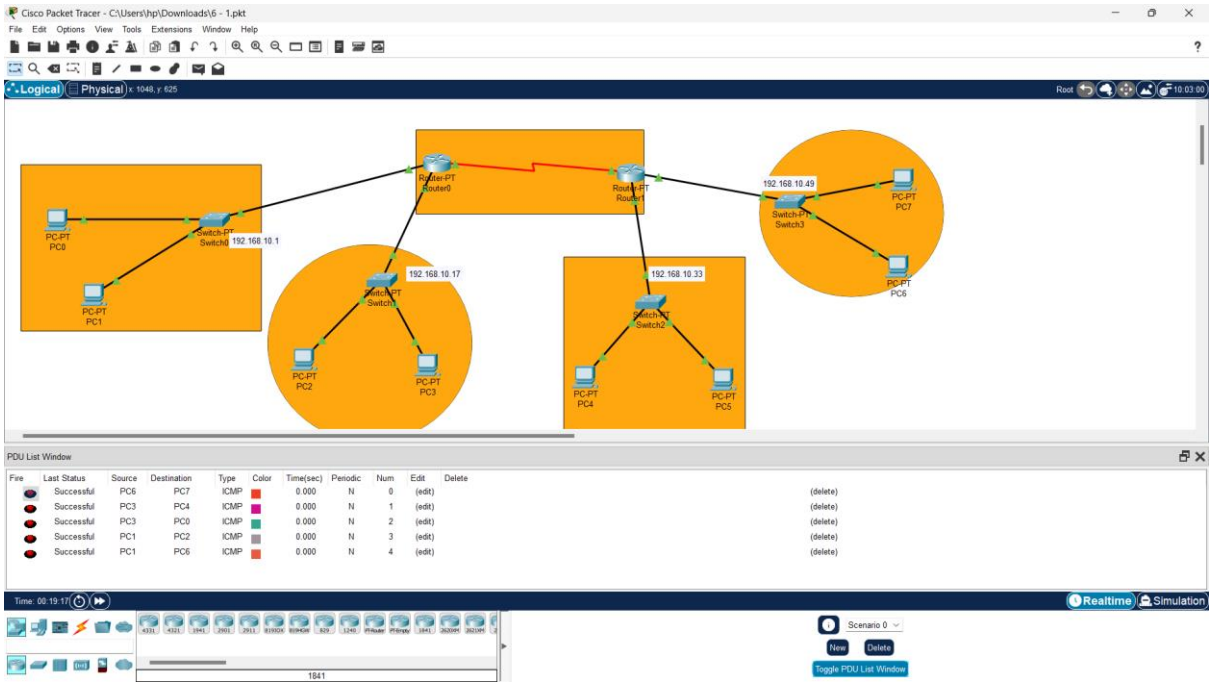
```
Cisco Packet Tracer PC Command Line 1.0
C:\>ipconfig

FastEthernet0 Connection:(default port)

   Connection-specific DNS Suffix..:
   Link-local IPv6 Address.....: FE80::201:63FF:FECA:8CA7
   IPv6 Address.....: ::
   IPv4 Address.....: 192.168.10.50
   Subnet Mask.....: 255.255.255.240
   Default Gateway.....: ::
                                 192.168.10.49

Bluetooth Connection:

   Connection-specific DNS Suffix..:
   Link-local IPv6 Address.....: ::
   IPv6 Address.....: ::
   IPv4 Address.....: 0.0.0.0
   Subnet Mask.....: 0.0.0.0
   Default Gateway.....: ::
                                 0.0.0.0

C:\>
```

PC7

Physical Config Desktop Programming Attributes

Command Prompt

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ipconfig

FastEthernet0 Connection:(default port)

   Connection-specific DNS Suffix..:
   Link-local IPv6 Address.....: FE80::2D0:BAFF:FEA2:132B
   IPv6 Address.....: ::
   IPv4 Address.....: 192.168.10.51
   Subnet Mask.....: 255.255.255.240
   Default Gateway.....: ::
                                 192.168.10.49

Bluetooth Connection:

   Connection-specific DNS Suffix..:
   Link-local IPv6 Address.....: ::
   IPv6 Address.....: ::
   IPv4 Address.....: 0.0.0.0
   Subnet Mask.....: 0.0.0.0
   Default Gateway.....: ::
                                 0.0.0.0

C:\>
```



2.Design a network using fixed length Subnetting for a class B Ipv4 address and configure it in Router.

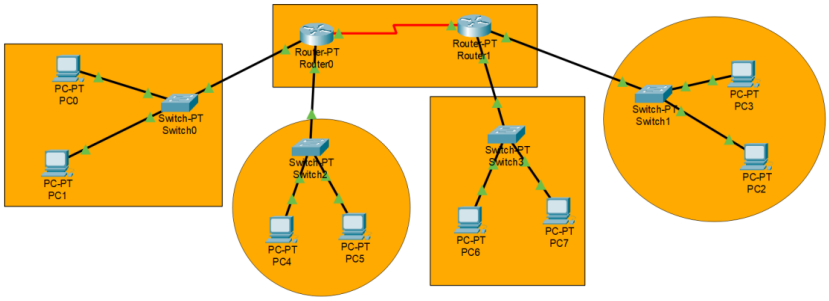
172.168.1.0/17

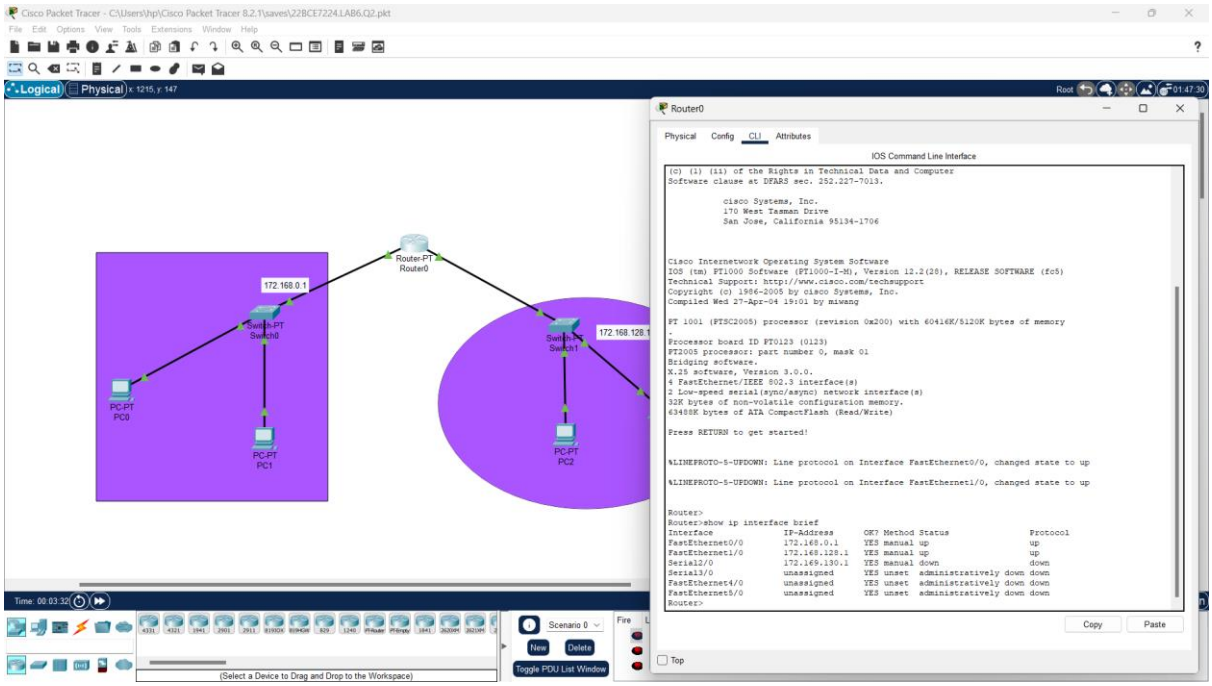
a) Mention the subnet masks of the above-mentioned IP Addresses
Ans. 255.255.128.0
b) Find the total number of subnets for each ip addresses
Ans. 2^(17-16) = 2
c) Find the total number of hosts that can be configured.
Ans. 2^(32 - 17) - 2 = 2^15 - 2 = 32,766 hosts per subnet.
d) Find out the broadcast ID for each of the IP addresses
172.168.127.255

Objectives:
1. Design the above network with packet tracer.
2. Each subnet should have two PCs (one for starting address and one using ending address.
3. Configure first 4 subnet as single network as below.
4. Show output of router config, pc's ip config and success message

```
Router#show ip interface brief
Interface              IP-Address      OK? Method Status                Protocol
FastEthernet0/0        192.168.1.97    YES manual up                    up
FastEthernet1/0        192.168.1.129   YES manual up                    up
Serial2/0              192.168.1.66    YES manual up                    up
Serial3/0              unassigned      YES unset  administratively down down
FastEthernet4/0        unassigned      YES unset  administratively down down
FastEthernet5/0        unassigned      YES unset  administratively down down
Router#
```

```
C:\>ipconfig

FastEthernet0 Connection:(default port)

   Connection-specific DNS Suffix..:
   Link-local IPv6 Address.....: FE80::205:5EFF:FEA3:D4C8
   IPv6 Address.....: ::
   IPv4 Address.....: 192.168.1.36
   Subnet Mask.....: 255.255.255.224
   Default Gateway.....: ::
                                 192.168.1.33
```





PC0

Physical Config Desktop Programming Attributes

Command Prompt

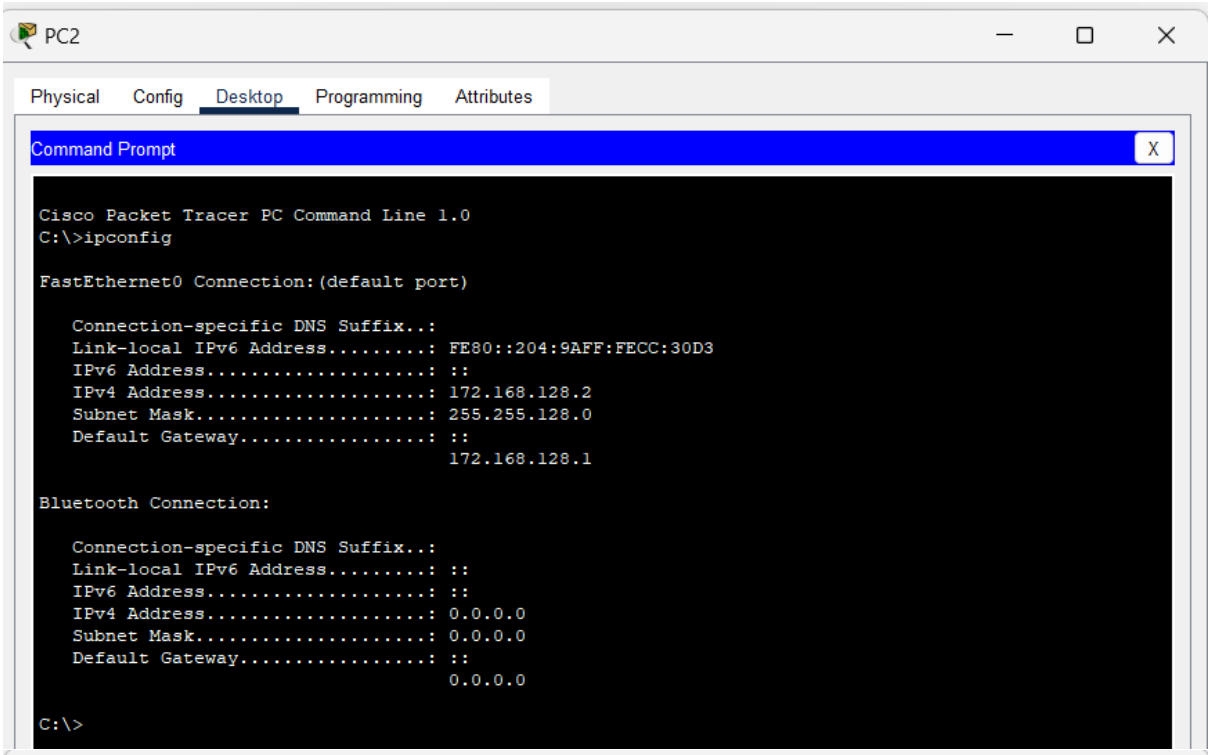
```
Cisco Packet Tracer PC Command Line 1.0
C:\>ipconfig

FastEthernet0 Connection:(default port)

   Connection-specific DNS Suffix..:
   Link-local IPv6 Address.....: FE80::2D0:D3FF:FE23:CE11
   IPv6 Address.....: ::
   IPv4 Address.....: 172.168.0.2
   Subnet Mask.....: 255.255.128.0
   Default Gateway.....: ::
                                 172.168.0.1

Bluetooth Connection:

   Connection-specific DNS Suffix..:
   Link-local IPv6 Address.....: ::
   IPv6 Address.....: ::
   IPv4 Address.....: 0.0.0.0
   Subnet Mask.....: 0.0.0.0
   Default Gateway.....: ::
                                 0.0.0.0

C:\>
```

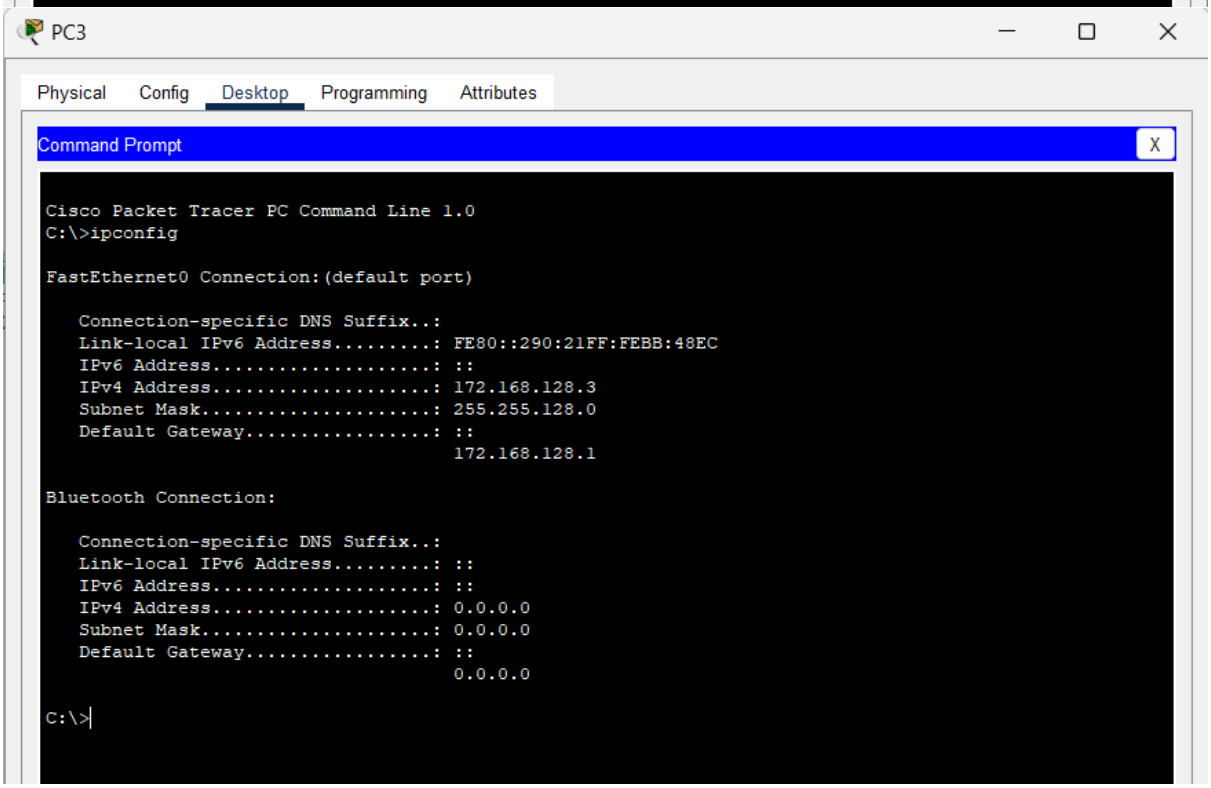
PC1

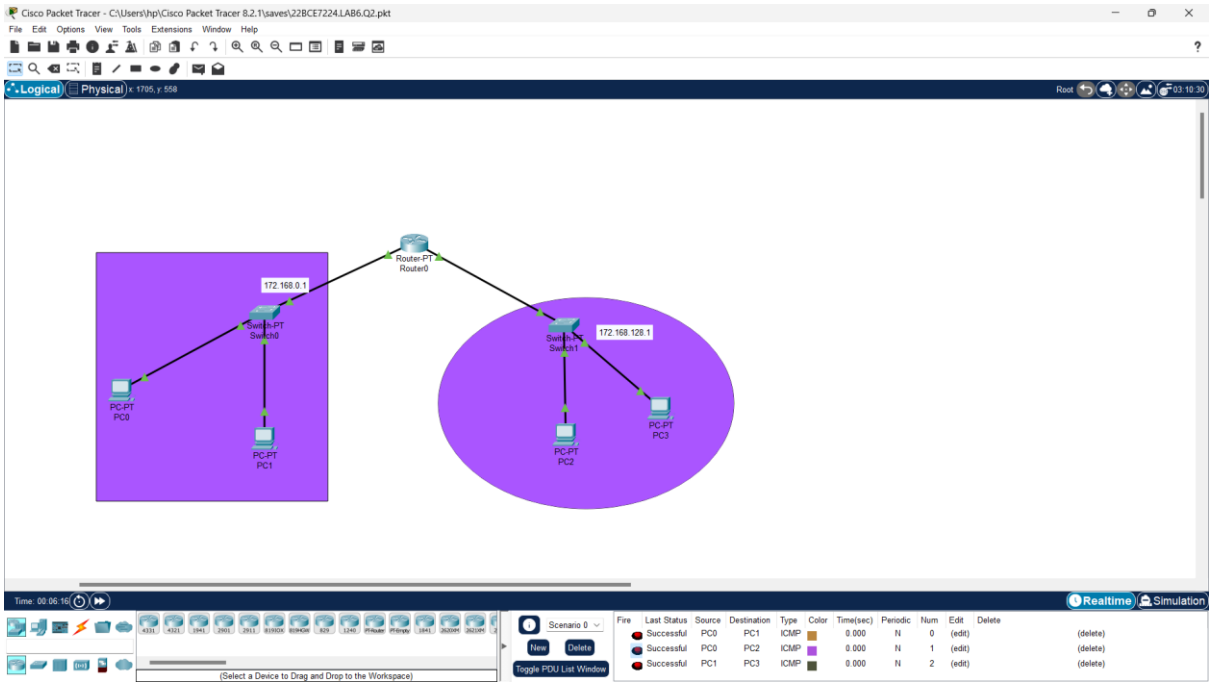
Physical Config Desktop Programming Attributes

Command Prompt

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ipconfig

FastEthernet0 Connection:(default port)

   Connection-specific DNS Suffix..:
   Link-local IPv6 Address.....: FE80::2D0:58FF:FE06:87A5
   IPv6 Address.....: ::
   IPv4 Address.....: 172.168.0.3
   Subnet Mask.....: 255.255.128.0
   Default Gateway.....: ::
                                 172.168.0.1

Bluetooth Connection:

   Connection-specific DNS Suffix..:
   Link-local IPv6 Address.....: ::
   IPv6 Address.....: ::
   IPv4 Address.....: 0.0.0.0
   Subnet Mask.....: 0.0.0.0
   Default Gateway.....: ::
                                 0.0.0.0

C:\>
```


PC2
Physical
Config
Desktop
Programming
Attributes
Command Prompt
X
Cisco Packet Tracer PC Command Line 1.0
C:\>ipconfig
FastEthernet0 Connection:(default port)
Connection-specific DNS Suffix..:
Link-local IPv6 Address.....: FE80::204:9AFF:FECC:30D3
IPv6 Address.....: ::
IPv4 Address.....: 172.168.128.2
Subnet Mask.....: 255.255.128.0
Default Gateway.....: ::
172.168.128.1
Bluetooth Connection:
Connection-specific DNS Suffix..:
Link-local IPv6 Address.....: ::
IPv6 Address.....: ::
IPv4 Address.....: 0.0.0.0
Subnet Mask.....: 0.0.0.0
Default Gateway.....: ::
0.0.0.0
C:\>


PC3
Physical
Config
Desktop
Programming
Attributes
Command Prompt
X
Cisco Packet Tracer PC Command Line 1.0
C:\>ipconfig
FastEthernet0 Connection:(default port)
Connection-specific DNS Suffix..:
Link-local IPv6 Address.....: FE80::290:21FF:FEBB:48EC
IPv6 Address.....: ::
IPv4 Address.....: 172.168.128.3
Subnet Mask.....: 255.255.128.0
Default Gateway.....: ::
172.168.128.1
Bluetooth Connection:
Connection-specific DNS Suffix..:
Link-local IPv6 Address.....: ::
IPv6 Address.....: ::
IPv4 Address.....: 0.0.0.0
Subnet Mask.....: 0.0.0.0
Default Gateway.....: ::
0.0.0.0
C:\>


Cisco Packet Tracer - C:\Users\hp\Cisco Packet Tracer 8.2.1\saves\22BCE7224.LAB6.Q2.pkt
File Edit Options View Tools Extensions Window Help
Logical
Physical
Root
Router-PT
Router0
172.168.0.1
Switch-PT
Switch0
172.168.128.1
Switch-PT
Switch1
PC-PT
PC0
PC-PT
PC1
PC-PT
PC2
PC-PT
PC3
Realtime
Simulation
(Select a Device to Drag and Drop to the Workspace)
Scenario 0
New
Delete
Toggle PDU List Window
Fire Last Status Source Destination Type Color Time(sec) Periodic Num Edit Delete
Successful PC0 PC1 ICMP 0.000 N 0 (edit) (delete)
Successful PC0 PC2 ICMP 0.000 N 1 (edit) (delete)
Successful PC1 PC3 ICMP 0.000 N 2 (edit) (delete)