Q3. Given a network address of 10.0.0.0/24, divide it into 4 equal subnets. Calculate the new Subnet mask. Determine the valid host range for each subnet. Assign IP addresses to devices in Packet Tracer and verify connectivity.

Network Address: 10.0.0.0/24

Subnet Mask: 255.255.255.0

Total available hosts in /24: 2^(32-24) - 2 = 254

To divide 10.0.0.0/24 into 4 equal subnets, we need to borrow 2 bits from the host portion.

Borrow 2 bits → /26

New Subnet Mask: 255.255.255.192

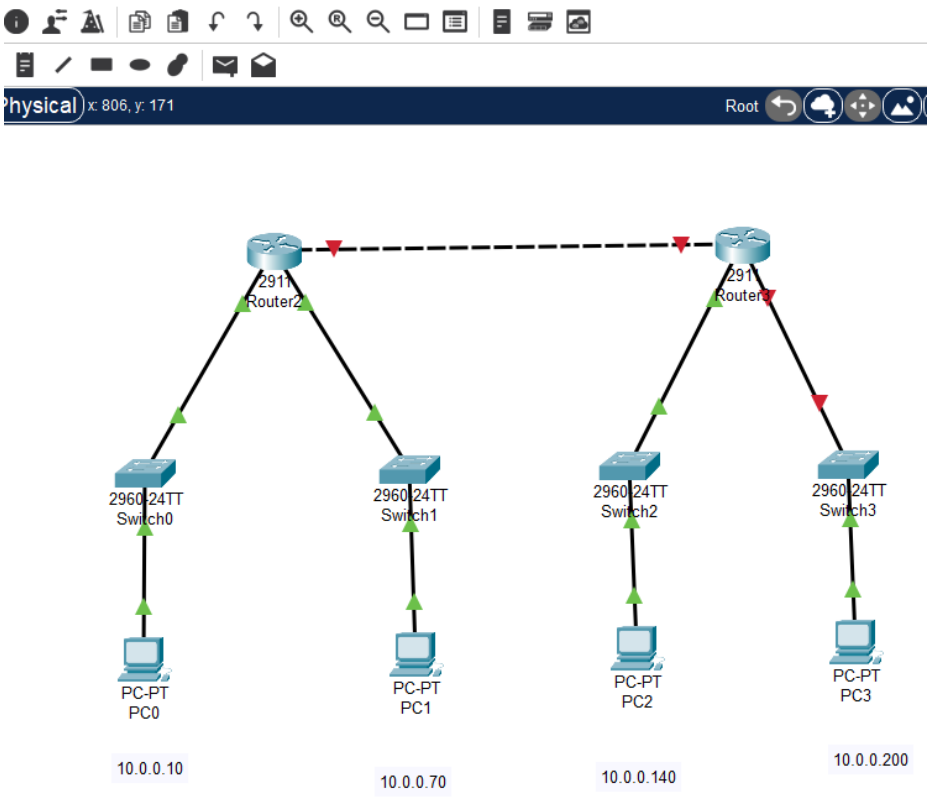
Usable Ip's : 2^(32-26) -2 = 62 (excluding network and Broadcast address)

Subnet 1 : Usable Ip Range - 10.0.0.1 to 10.0.0.62 here Network Address - 10.0.0.0 and broadcast Address- 10.0.0.63

Subnet 2 : Ip Range - 10.0.0.65 to 10.0.0.126 here Network Add - 10.0.0.64 and broadcast Add- 10.0.0.127

Subnet 3 : Ip Range - 10.0.0.129 to 10.0.0.190 here Network Add - 10.0.0.128 and broadcast Add- 10.0.0.191

Subnet 4 : Ip Range - 10.0.0.193 to 10.0.0.254 here Network Add - 10.0.0.192 and broadcast Add- 10.0.0.255



Router 1

```
Router>enable
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)# interface GigabitEthernet 0/0
Router(config-if)#ip address 10.0.0.1 255.255.255.192
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up
exit
Router(config)#interface GigabitEthernet 0/1
Router(config-if)#ip address 10.0.0.65 255.255.255.192
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed state to up
exit
Router(config)#
```

Router 2

```
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#ip route 10.0.0.1 255.255.255.192 10.0.0.65
%Inconsistent address and mask
Router(config)#ip route 10.0.0.65 255.255.255.192 10.0.0.1
%Inconsistent address and mask
Router(config)#ip route 10.0.0.0 255.255.255.192 10.0.0.65
Router(config)#ip route 10.0.0.64 255.255.255.192 10.0.0.1
Router(config)#write memory
               ^
% Invalid input detected at '^' marker.

Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
write memory
Building configuration...
[OK]
```

```
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#interface GigabitEthernet0/2
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#write memory
               ^
% Invalid input detected at '^' marker.

Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
write memory
Building configuration...
[OK]
Router#show ip interface brief
Interface              IP-Address      OK? Method Status                Protocol
GigabitEthernet0/0     10.0.0.193      YES manual up                    up
GigabitEthernet0/1     unassigned      YES unset  administratively down down
GigabitEthernet0/2     10.0.0.129      YES manual up                    down
Vlan1                  unassigned      YES unset  administratively down down
Router#show ip route
Codes: L - local, C - connected, S - static, 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

     10.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C       10.0.0.192/26 is directly connected, GigabitEthernet0/0
L       10.0.0.193/32 is directly connected, GigabitEthernet0/0
```

Ping successful

```
PS C:\Users\brindha> ping 10.0.0.150

Pinging 10.0.0.150 with 32 bytes of data:
Reply from 10.0.0.150: bytes=32 time=15ms TTL=251
Reply from 10.0.0.150: bytes=32 time=6ms TTL=251
Reply from 10.0.0.150: bytes=32 time=6ms TTL=251
Reply from 10.0.0.150: bytes=32 time=6ms TTL=251

Ping statistics for 10.0.0.150:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 6ms, Maximum = 15ms, Average = 8ms
PS C:\Users\brindha>
```