Name :

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**Roll no :**

        P20-0560

Lab :

        11

Lab Task 1:

In this activity, you are given the network address of
192.168.100.0/24 to subnet and provide the IP addressing for the
Packet Tracer network. Each LAN in the network requires at least 25 addresses for
end devices, the switch and the router. The connection between R1 to R2 will
require an IP address for each end of the link.

Subnet the **192.168.100.0/24** network into the appropriate number of subnets.

➔Topology:
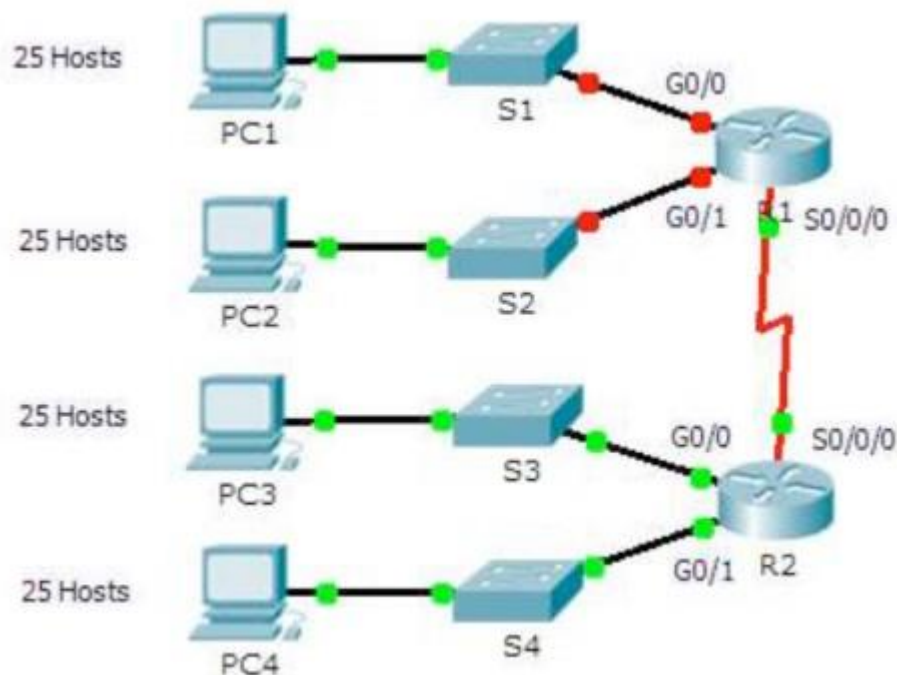
➔Questions:

1. Based on the topology, how many subnets are needed?

Ans)   Based on the Topology Five Subnets are required. First Subnet for host connected with switch1, Second Subnet for host connected with switch2, Third Subnet for host connected with switch3, Fourth Subnet for host connected with switch4 and Fifth for connection between Routers.

2. How many bits must be borrowed to support the number of subnets in the topology?

Ans)   For 5 subnets we have to borrow at least 3 bits from the Host Bits. As the given ip is "/24", But after borrowing three Bits it would be "/27".

3. How many subnets does this create?

Ans)   According to the Formula of 2^no of borrowed bits, As we borrow three bits from Host bits, so a total of 8 subnets will be created.

4. How many usable hosts does this create per subnet?

Ans) 2x2x2x2x2 = 32-2 = 30 usable Hosts in each Subnet.

5. Calculate the binary value for the first fivesubnets.

Subnet	Network Address	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	192.168.100.0	0	0	0	0	0	0	0	0
1	192.168.100.32	0	0	1	0	0	0	0	0

2	192.168.100.64	0	1	0	0	0	0	0	0
3	192.168.100.96	0	1	1	0	0	0	0	0
4	192.168.100.128	1	0	0	0	0	0	0	0

6. Calculate the binary and decimal value of thenew subnet mask.

Ans) The Binary Value is :

1st octet   2nd octet   3rd octet   4th octet **1 1 1 1 1 1 1 1 .**

1 1 1 1 1 1 1 1 . 1 1 1 1 1 1 1 1 . 1 1 1 0 0 0 0 0

The Decimal Value of the Subnet Mask is : 255.255.255.224.

7. Fill in the Subnet Table, listing the decimalvalue of all available subnets, the first and last usable host address, and the broadcast address.
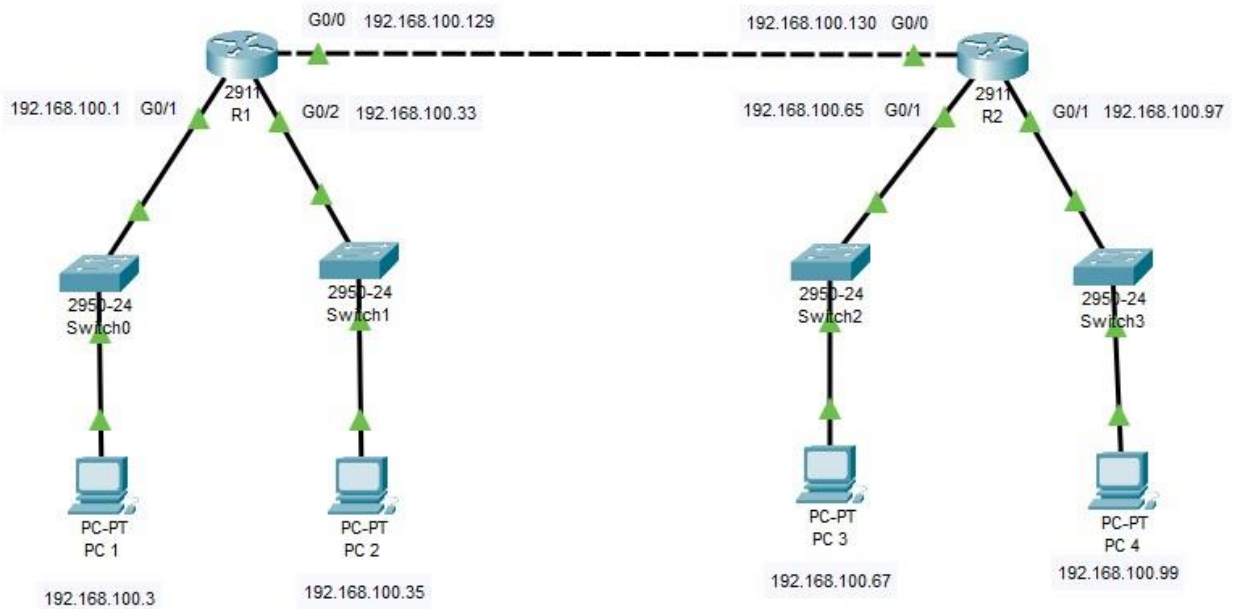## Repeat until all addresses are listed.

Subnet Number	Subnet Address	First Usable IP Address	Last Usable IP Address	Broadcast Address
0	192.168.100.0	192.168.100.1	192.168.100.30	192.168.100.31
1	192.168.100.32	192.168.100.33	192.168.100.62	192.168.100.63

2	192.168.100.64	192.168.100.65	192.168.100.94	192.168.100.95
3	192.168.100.96	192.168.100.97	192.168.100.126	192.168.100.127
4	192.168.100.128	192.168.100.129	192.168.100.158	192.168.100.159
5	192.168.100.160	192.168.100.161	192.168.100.190	192.168.100.191
6	192.168.100.192	192.168.100.193	192.168.100.222	192.168.100.223
7	192.168.100.224	192.168.100.225	192.168.100.254	192.168.100.255

➔ Assign the subnets to the network shown in the topology.

1. Assign Subnet 0 to the LAN connected to the GigabitEthernet 0/0 interface of R1:
2. Assign Subnet 1 to the LAN connected to the GigabitEthernet 0/1 interface of R1:
3. Assign Subnet 2 to the LAN connected to the GigabitEthernet 0/0 interface of R2:
4. Assign Subnet 3 to the LAN connected to the GigabitEthernet 0/1 interface of R2:
5. Assign Subnet 4 to the WAN link between R1 to R2:

Topology:

G0/0 192.168.100.129 — 192.168.100.130 G0/0

192.168.100.1 G0/1 2911 R1 G0/2 192.168.100.33   192.168.100.65 G0/1 2911 R2 G0/1 192.168.100.97

2950-24 Switch0   2950-24 Switch1   2950-24 Switch2   2950-24 Switch3

PC-PT PC 1   PC-PT PC 2   PC-PT PC 3   PC-PT PC 4

192.168.100.3   192.168.100.35   192.168.100.67   192.168.100.99

➔ Document the addressing scheme:

Device	Interface	IP Address	Subnet Mask	Default Gateway
R1	G0/1	192.168.100.1	255.255.255.224	192.168.100.2
	G0/2	192.168.100.33	255.255.255.224	192.168.100.34
	G0/0	192.168.100.129	255.255.255.224	Not Applicable
R2	G0/1	192.168.100.65	255.255.255.224	192.168.100.66
	G0/2	192.168.100.97	255.255.255.224	192.168.100.98
	G0/0	192.168.100.130	255.255.255.224	Not Applicable
PC1	NIC	192.168.100.3	255.255.255.224	192.168.100.2

PC2	NIC	192.168.100.35	255.255.255.224	192.168.100.34
PC3	NIC	192.168.100.67	255.255.255.224	192.168.100.66
PC4	NIC	192.168.100.99	255.255.255.224	192.168.100.98

Lab Task 2:

Implement Task 4 (Lab 10) in Packet Tracer and Assign IP Addresses to Network Devices and Verify Connectivity.

Topology:
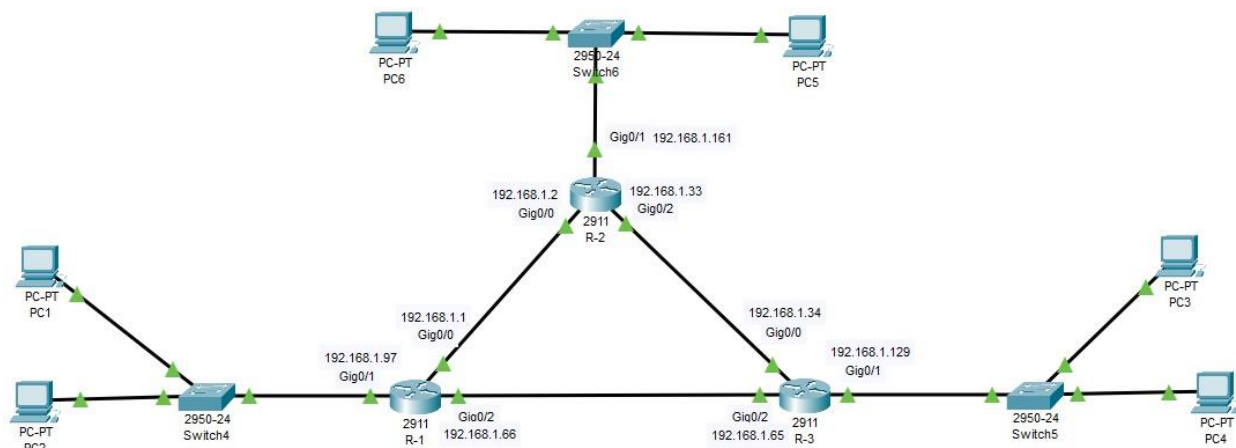
➔ **Addressing Scheme**

Device	Interface	IP Address	Subnet Mask	Default Gateway
R-1	G0/0	192.168.1.1	255.255.255.224	Not Applicable
	G0/1	192.168.1.97	255.255.255.224	192.168.1.98
	G0/2	192.168.1.66	255.255.255.224	Not Applicable
R-2	G0/0	192.168.1.2	255.255.255.224	Not Applicable
	G0/1	192.168.1.161	255.255.255.224	192.168.1.162
	G0/2	192.168.1.33	255.255.255.224	Not Applicable
R-3	G0/0	192.168.1.34	255.255.255.224	Not Applicable
	G0/1	192.168.1.129	255.255.255.224	192.168.1.130
	G0/2	192.168.1.65	255.255.255.224	Not Applicable
PC1	NIC	192.168.1.99	255.255.255.224	192.168.1.98
PC2	NIC	192.168.1.100	255.255.255.224	192.168.1.98
PC3	NIC	192.168.1.131	255.255.255.224	192.168.1.130
PC4	NIC	192.168.1.132	255.255.255.224	192.168.1.130
PC5	NIC	192.168.1.163	255.255.255.224	192.168.1.162

PC6	NIC	192.168.1.164	255.255.255.224	192.168.1.162

Checking Connectivity :