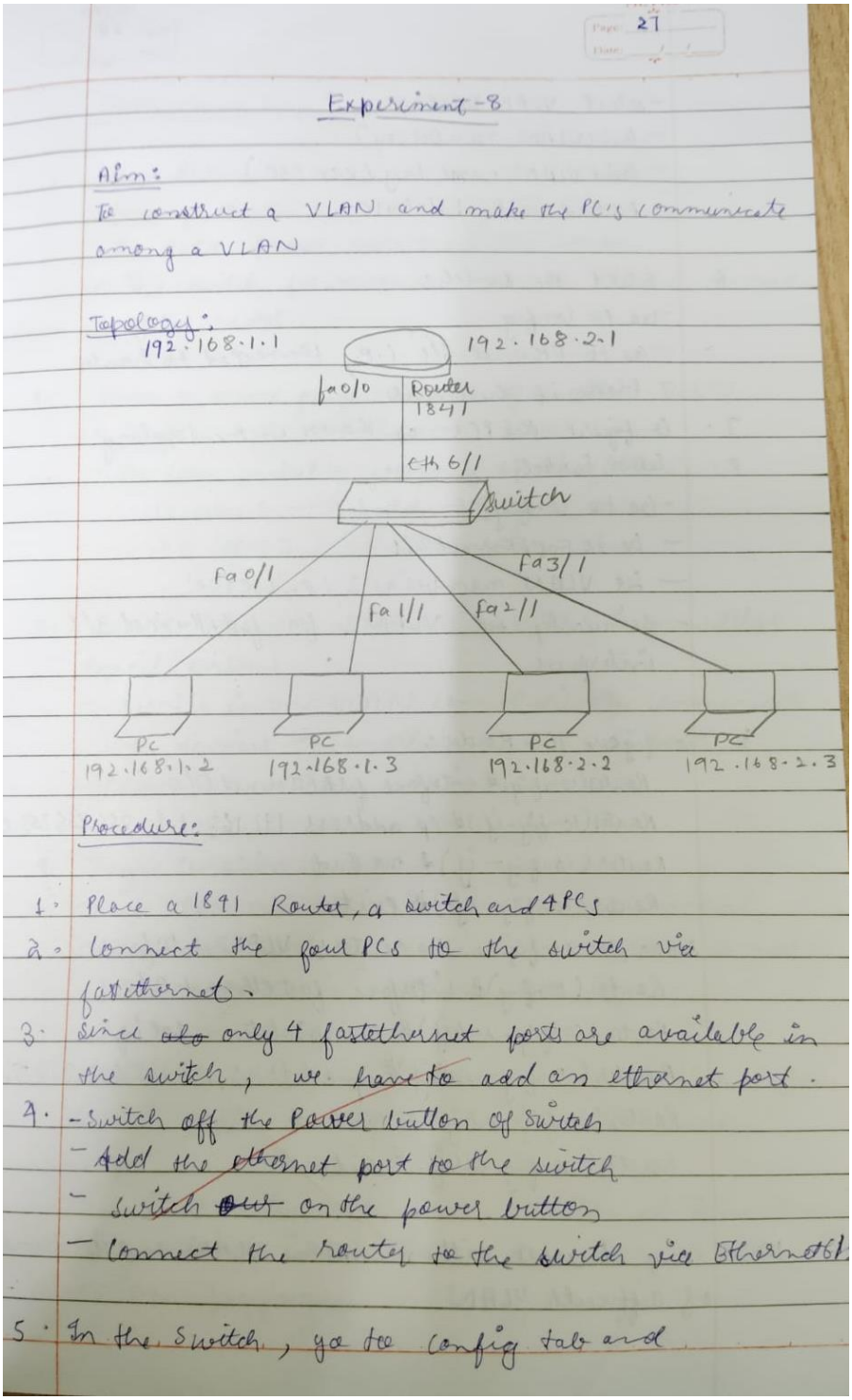
**Program 12**

**Aim:**To construct a VLAN and make the PC's communicate among a VLAN .

**Topology , Procedure and Observation:**



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Experiment-8

Aim:

To construct a VLAN and make the PC's communicate among a VLAN

Topology:



Procedure:

1. Place a 1841 Router, a switch and 4 PCs
2. Connect the four PCs to the switch via fastethernet.
3. Since only 4 fastethernet ports are available in the switch, we have to add an ethernet port.
4. - Switch off the Power button of switch
   - Add the ethernet port to the switch
   - switch on the power button
   - Connect the router to the switch via Ethernet 6/1
5. In the Switch, go to config tab and

- Select VLAN database
- Give VLAN number say 2
- Give VLAN name say (cseise)
- Add it to the database

6. Select the switch:
- Go to config
- Go to Ethernet 0/1, i.e., connected to Router
- Make it the trunk

7. Configure the PCs as shown in the topology

8. Select Switch
- Go to config
- Go to FastEthernet 2/1
- Set VLAN number as 2, i.e., 'cseise'
- similarly set VLAN 2 for fastEthernet 3/1 interfaces

9. Configure the Router:

Router(config)# interface fastEthernet 0/0
Router(config-if)# ip address 192.168.1.1 255.255.255.0
Router(config-if)# no shut
Router(config-if)# exit

Now, to configure the router's VLAN interface
Router(config)# interface fastethernet 0/0.1
Router(config-subif)# encapsulation dot1q 2
Router(config-subif)# ip address 192.168.2.1 255.255.255.0
Router(config-subif)# no shut
Router(config-subif)# exit

10. Ping devices within same VLAN and to devices of difficult VLAN

Observations:

1. When devices are pinged within same VLAN:
   - Pinging 192.168.1.3 from 192.168.1.2
   - The data packet doesn't go to the router
   - The switch forwards the packet without the need of the router.

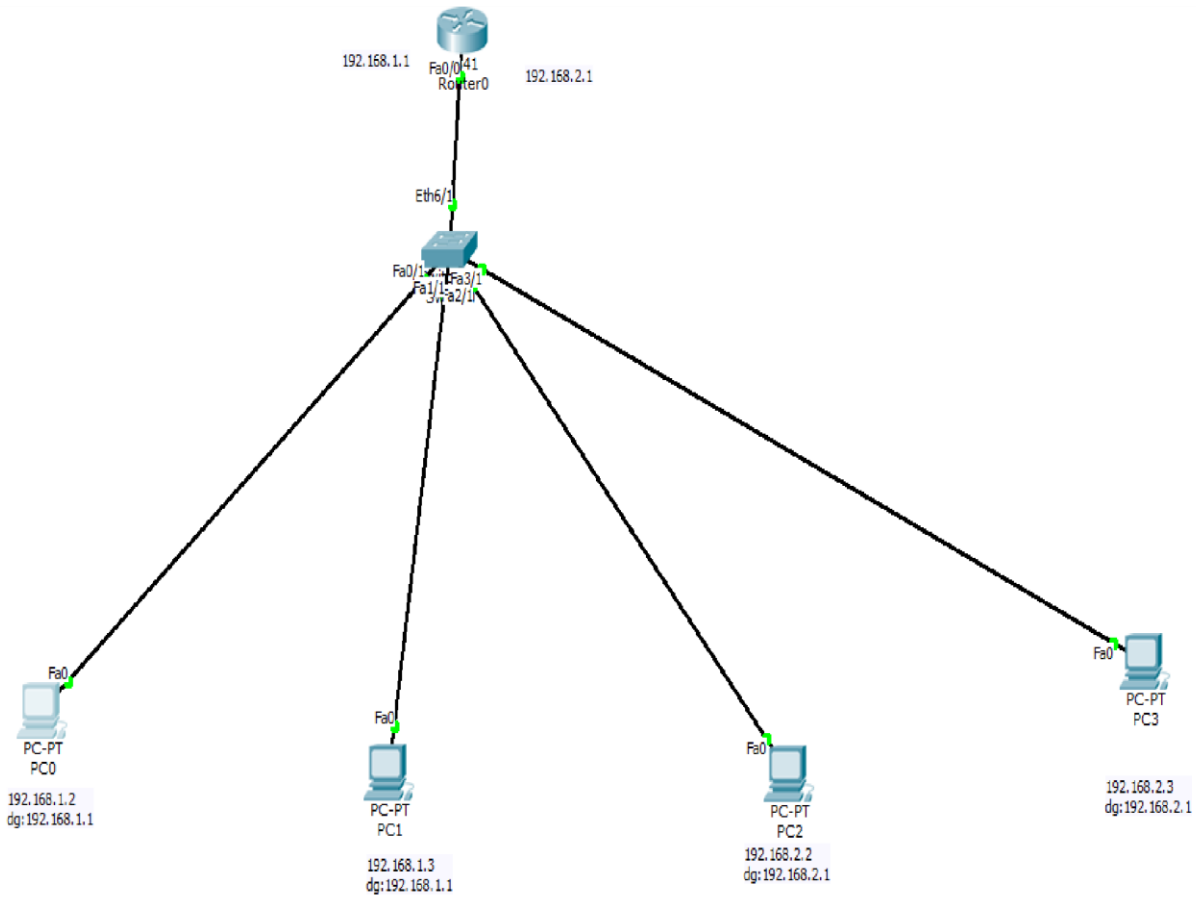
2. When a device pings a device of another VLAN
   - Pinging 192.168.2.3 from 192.168.1.2
   - The data packet's journey is as follows:
     192.168.1.2 → Switch → Router
     192.168.2.3 ← switch ←

3. VLANs divide a single switch into multiple logical switches.
   - Devices in one VLAN cannot directly communicate with devices in another VLAN without a router

4. Traffic Isolation:
   - Each VLAN maintains its own broadcast domain
   - Broadcasts sent by devices in on VLAN do not reach devices in another VLAN

5. VLAN trunking allows switches to forward frames from different VLANs over a single link called trunk
   - This is done by adding an additional header information called tag to the ethernet frame
   - VLAN tagging.

**Screen Shots:**



## Command Prompt

```
Packet Tracer PC Command Line 1.0
PC>ping 192.168.2.2

Pinging 192.168.2.2 with 32 bytes of data:

Request timed out.
Reply from 192.168.2.2: bytes=32 time=0ms TTL=127
Reply from 192.168.2.2: bytes=32 time=0ms TTL=127
Reply from 192.168.2.2: bytes=32 time=4ms TTL=127

Ping statistics for 192.168.2.2:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 4ms, Average = 1ms

PC>ping 192.168.2.2

Pinging 192.168.2.2 with 32 bytes of data:

Reply from 192.168.2.2: bytes=32 time=0ms TTL=127
Reply from 192.168.2.2: bytes=32 time=0ms TTL=127
Reply from 192.168.2.2: bytes=32 time=2ms TTL=127
Reply from 192.168.2.2: bytes=32 time=0ms TTL=127

Ping statistics for 192.168.2.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 2ms, Average = 0ms

PC>ping 192.168.2.3

Pinging 192.168.2.3 with 32 bytes of data:

Request timed out.
Reply from 192.168.2.3: bytes=32 time=3ms TTL=127
Reply from 192.168.2.3: bytes=32 time=2ms TTL=127
Reply from 192.168.2.3: bytes=32 time=1ms TTL=127

Ping statistics for 192.168.2.3:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 3ms, Average = 2ms

PC>ping 192.168.2.3

Pinging 192.168.2.3 with 32 bytes of data:

Reply from 192.168.2.3: bytes=32 time=0ms TTL=127
Reply from 192.168.2.3: bytes=32 time=0ms TTL=127
Reply from 192.168.2.3: bytes=32 time=2ms TTL=127
Reply from 192.168.2.3: bytes=32 time=0ms TTL=127

Ping statistics for 192.168.2.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 2ms, Average = 0ms

PC>
```