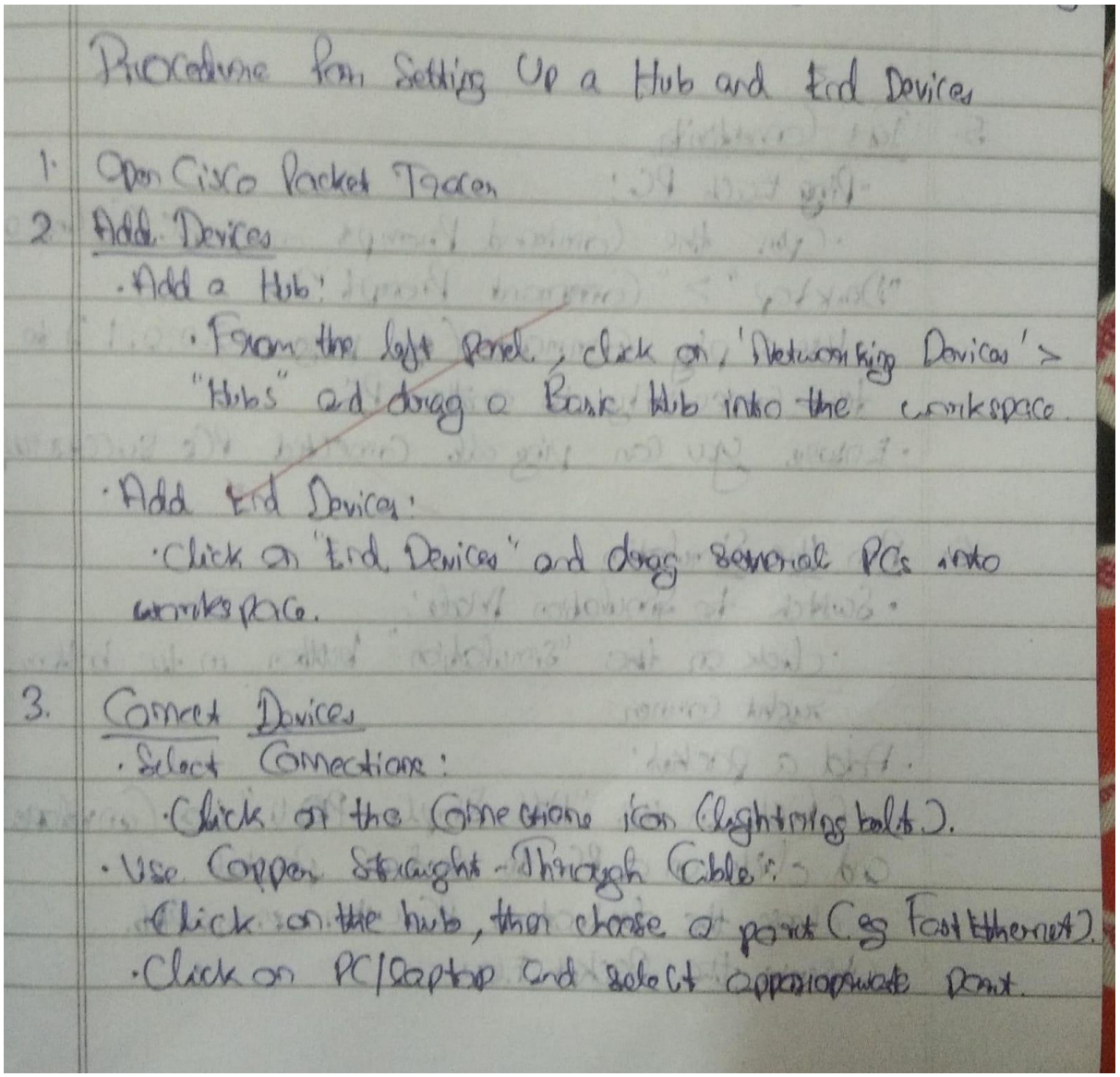
# LABORATORY PROGRAM – 1

Create a topology and simulate sending a simple PDU from source to destination using hub and switch as connecting devices and demonstrate ping message.



Procedure for Setting Up a Hub and End Devices

1. Open Cisco Packet Tracer
2. Add Devices
   - Add a Hub:
     - From the left panel, click on 'Networking Devices' > "Hubs" and drag a Basic Hub into the workspace.
   - Add End Devices:
     - Click on 'End Devices' and drag several PCs into workspace.
3. Connect Devices
   - Select Connections:
     - Click on the Connections icon (lightning bolt).
   - Use Copper Straight-Through Cable:
     - Click on the hub, then choose a port (eg FastEthernet).
     - Click on PC/Laptop and select appropriate port.

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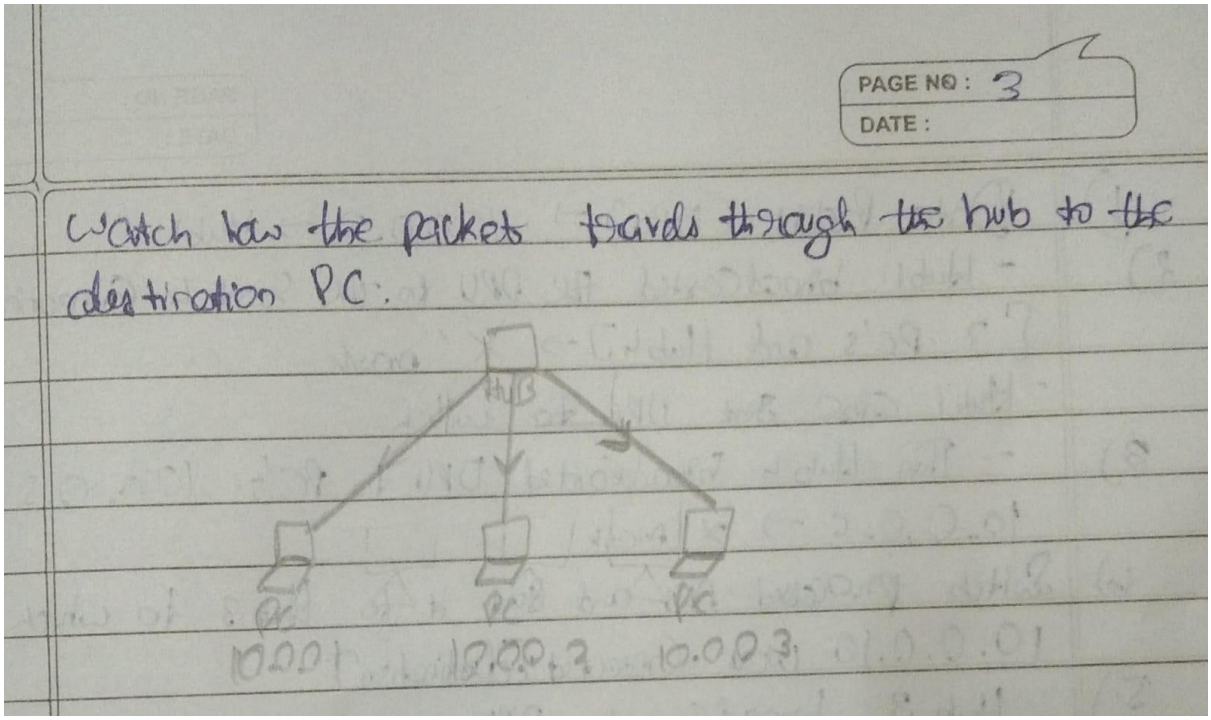
- Repeat for all end devices connected to the hub.

4. Configure End devices:
   - Select each PC:
     - Click on a PC, then click "Desktop" tab.
     - Choose "IP Configuration".
     - Assign an IP address (eg 10.0.0.1 for PC1, 10.0.0.2 for PC2 etc). and a Subnet Mask (eg. 255.255.255.0).
   - Label Devices:
     - Right click on each PC and select "Rename" to give them meaningful names (eg PC1, PC2).

5. Test Connectivity
   - Ping Each PC:
     - Open the Command Prompt on a PC. (Click on "Desktop" > "Command Prompt").
     - Use a ping command (eg ping 10.0.0.1) to test connectivity to another PC.
   - Ensure you can ping all connected PCs successfully

6. Run the Simulation
   - Switch to Simulation Mode:
     - click on the "Simulation" button in the bottom right corner
   - Add a Packet:
     - Click on the "Add Simple PDU" icon (envelope icon) and click on a PC to send a packet.
     - choose the destination PC when prompted.
   - Observe the Packet Flow:

10.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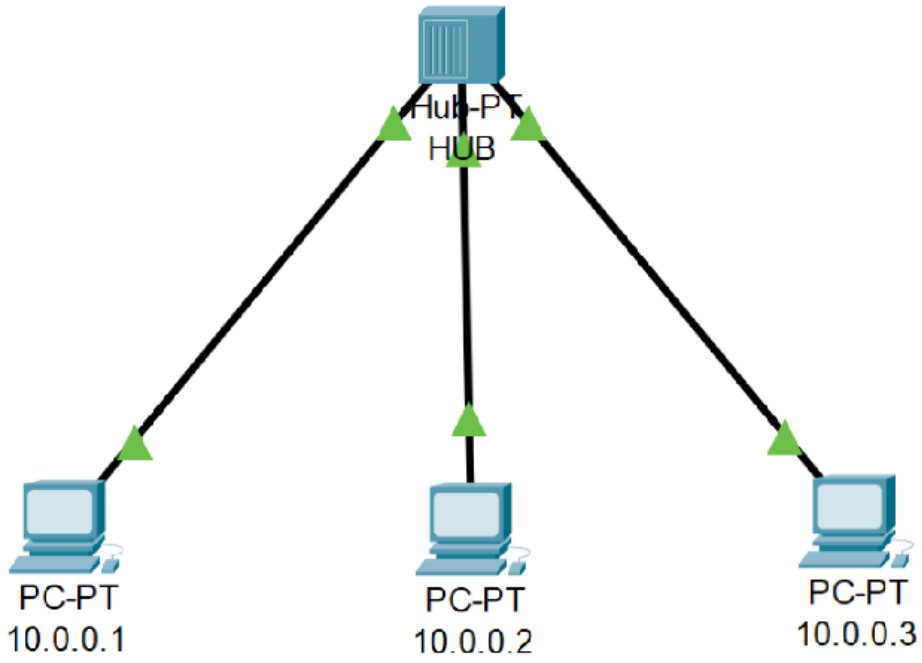
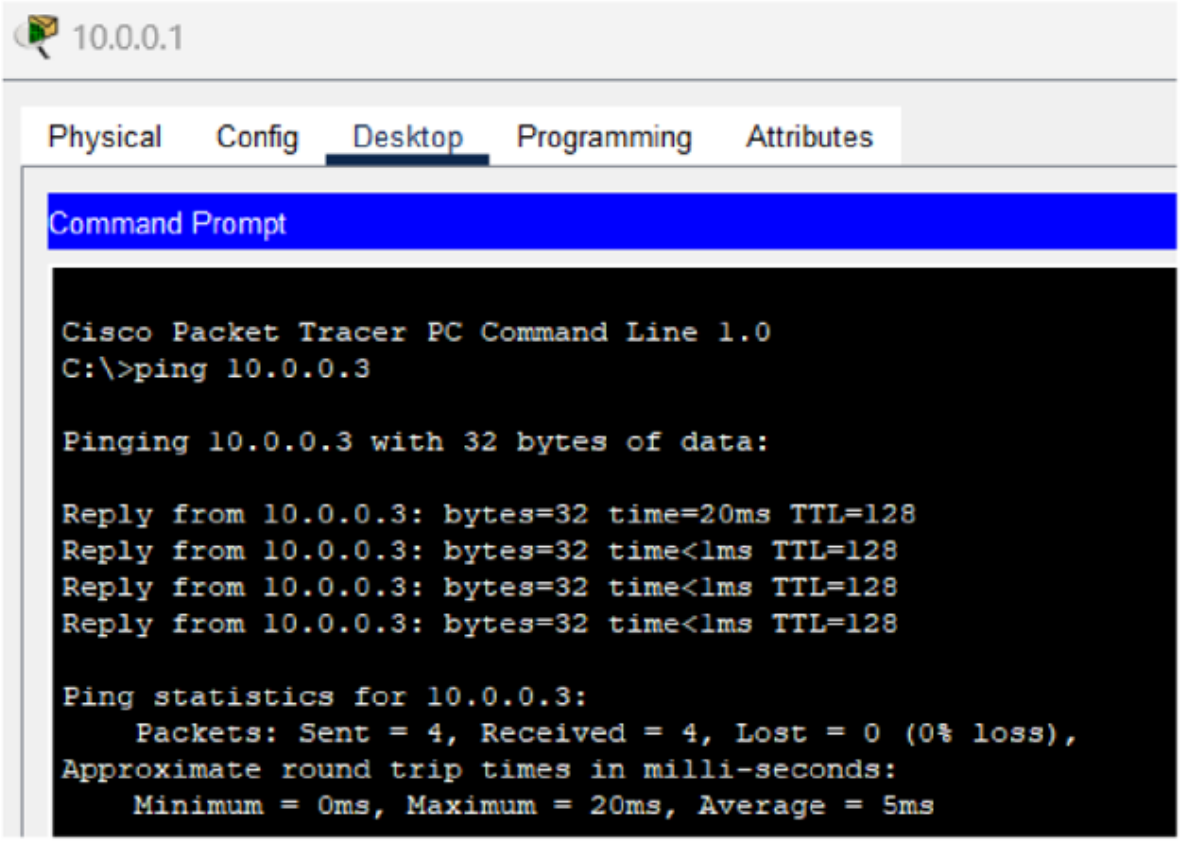
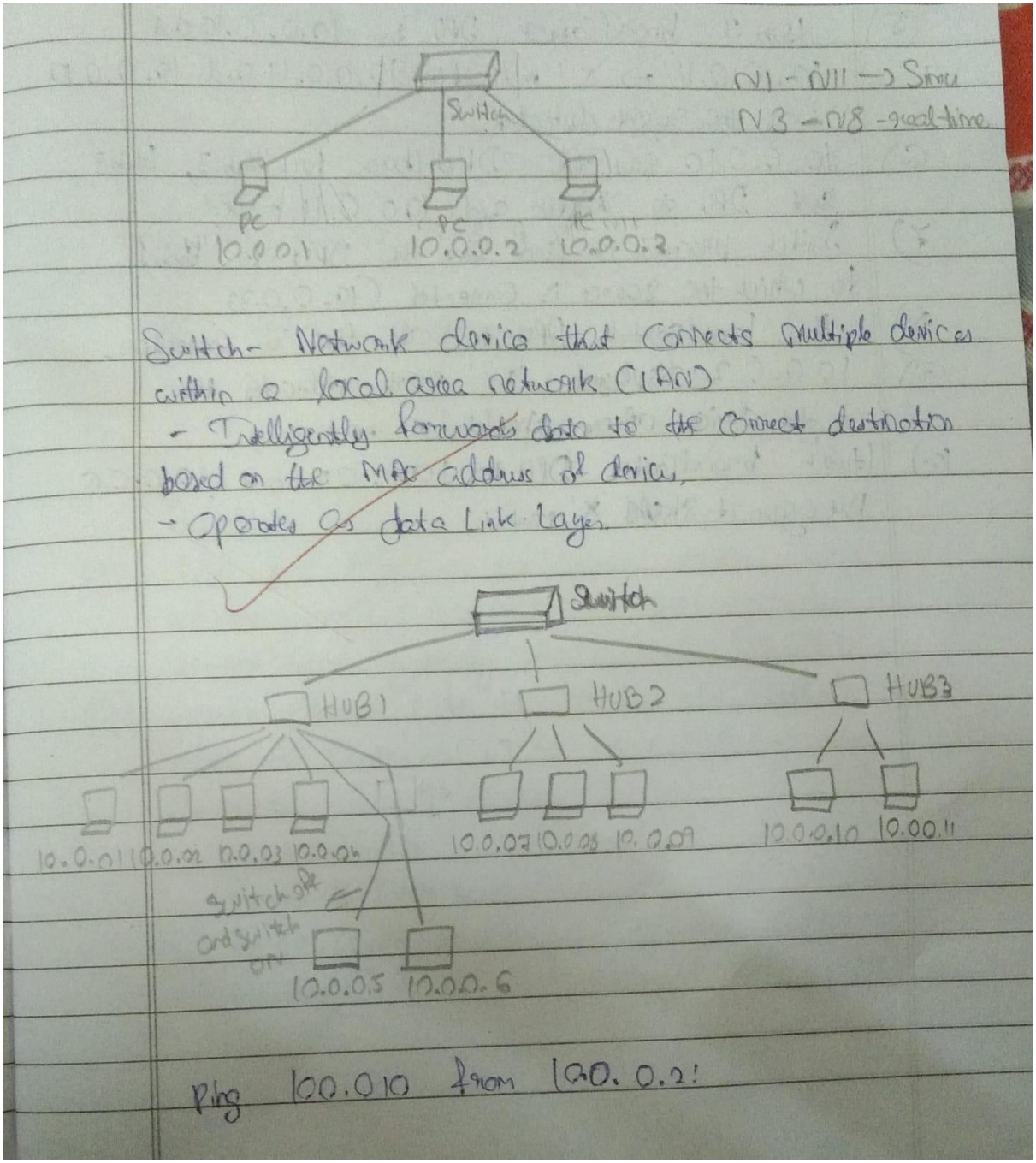
watch how the packets travels through the hub to the destination PC.
HUB
PC
PC
PC
10.0.0.1
10.0.0.2
10.0.0.3

Screenshot:


Hub-PT
HUB
PC-PT
10.0.0.1
PC-PT
10.0.0.2
PC-PT
10.0.0.3


10.0.0.1
Physical
Config
Desktop
Programming
Attributes
Command Prompt
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 10.0.0.3
Pinging 10.0.0.3 with 32 bytes of data:
Reply from 10.0.0.3: bytes=32 time=20ms TTL=128
Reply from 10.0.0.3: bytes=32 time<1ms TTL=128
Reply from 10.0.0.3: bytes=32 time<1ms TTL=128
Reply from 10.0.0.3: bytes=32 time<1ms TTL=128
Ping statistics for 10.0.0.3:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 20ms, Average = 5ms


Switch
PC
PC
PC
10.0.0.1
10.0.0.2
10.0.0.3
NI - NII → Simu
N3 - N8 - real-time
Switch- Network device that connects multiple devices within a local area network (LAN)
- Intelligently forwards data to the correct destination based on the MAC address of device.
- Operates as data Link Layer.
Switch
HUB1
HUB2
HUB3
10.0.0.1
10.0.0.2
10.0.0.3
10.0.0.4
10.0.0.7
10.0.0.8
10.0.0.9
10.0.0.10
10.0.0.11
switch off
and switch on
10.0.0.5
10.0.0.6
Ping 10.0.0.10 from 10.0.0.2!

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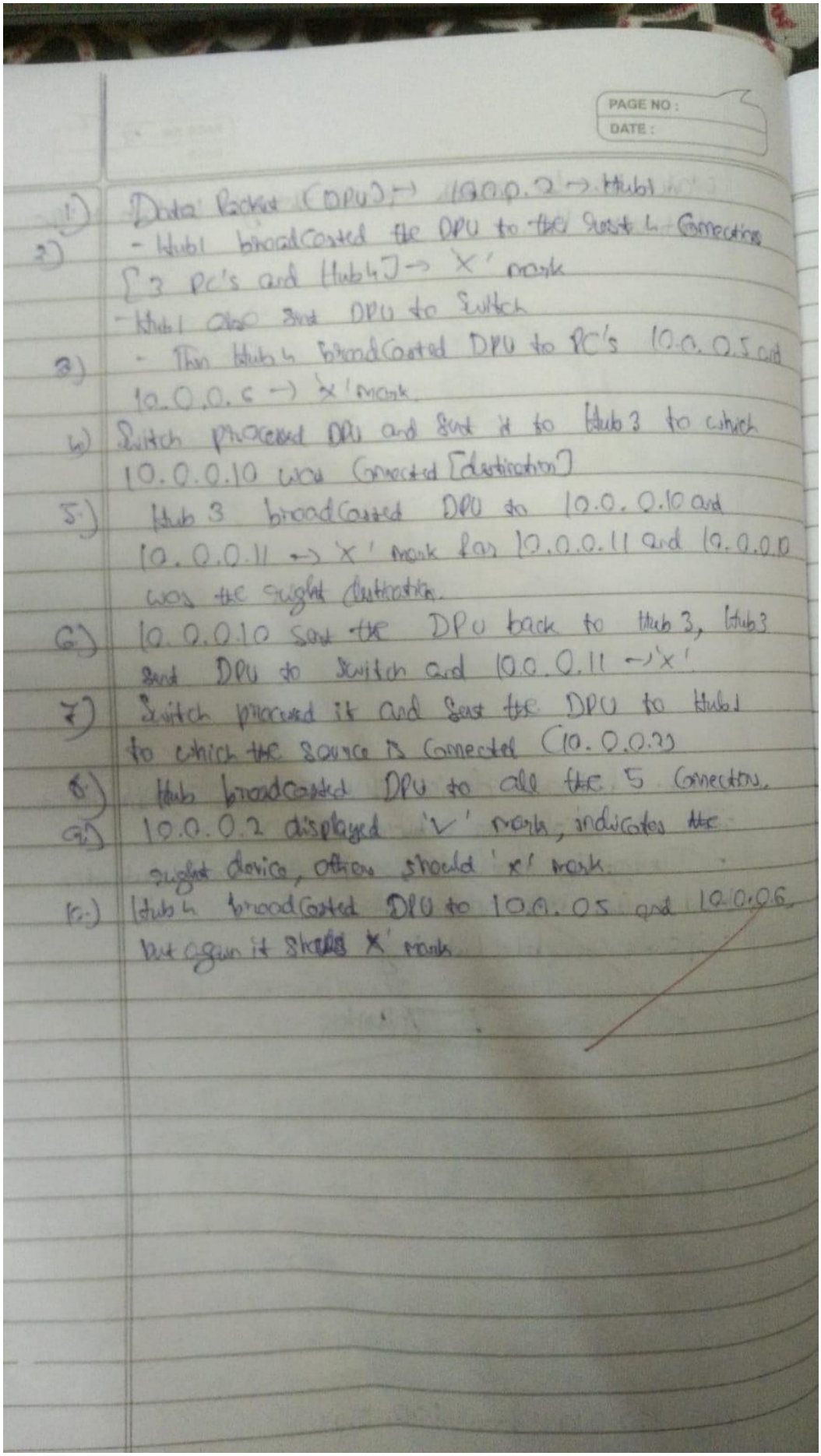
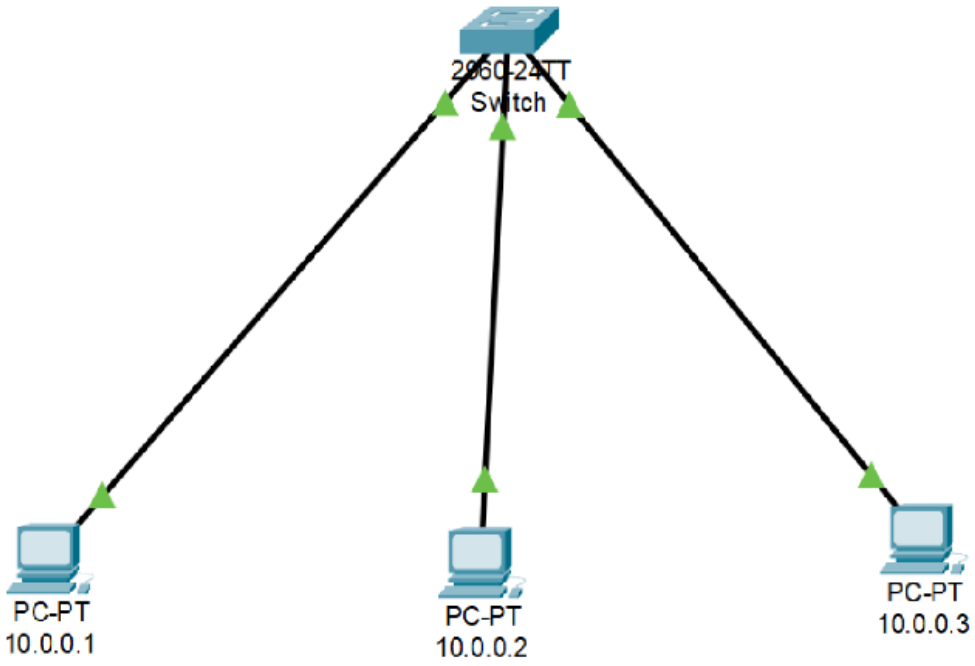


1) Data Packet (DPU) → 10.0.0.2 → Hub1
2) - Hub1 broadcasted the DPU to the rest 4 Connections [3 PC's and Hub4] → 'x' mark
- Hub1 also sent DPU to Switch
3) - Then Hub4 broadCasted DPU to PC's 10.0.0.5 and 10.0.0.6 → 'x' mark.
4) Switch processed DPU and sent it to Hub3 to which 10.0.0.10 was Connected [destination]
5) Hub3 broadCasted DPU to 10.0.0.10 and 10.0.0.11 → 'x' mark for 10.0.0.11 and 10.0.0.0 was the right destination.
6) 10.0.0.10 sent the DPU back to Hub3, Hub3 sent DPU to Switch and 10.0.0.11 → 'x'
7) Switch processed it and sent the DPU to Hub1 to which the source is Connected (10.0.0.2)
8) Hub broadCasted DPU to all the 5 Connections.
9) 10.0.0.2 displayed 'V' mark, indicates the right device, others should 'x' mark.
10) Hub4 broadCasted DPU to 10.0.0.5 and 10.0.0.6 but again it shows 'x' mark.




10.0.0.1

Physical | Config | Desktop | Programming | Attributes

Command Prompt

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 10.0.0.3

Pinging 10.0.0.3 with 32 bytes of data:

Reply from 10.0.0.3: bytes=32 time<1ms TTL=128
Reply from 10.0.0.3: bytes=32 time<1ms TTL=128
Reply from 10.0.0.3: bytes=32 time<1ms TTL=128
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Ping statistics for 10.0.0.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```