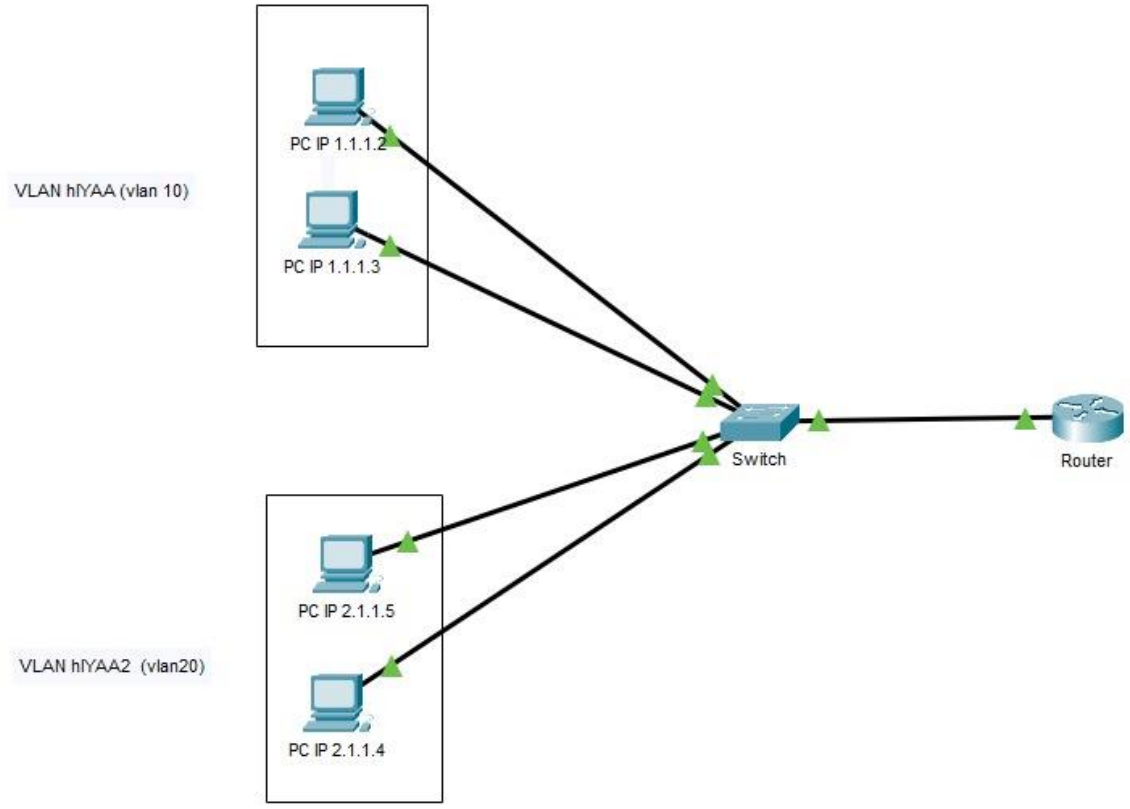
Experiment 4

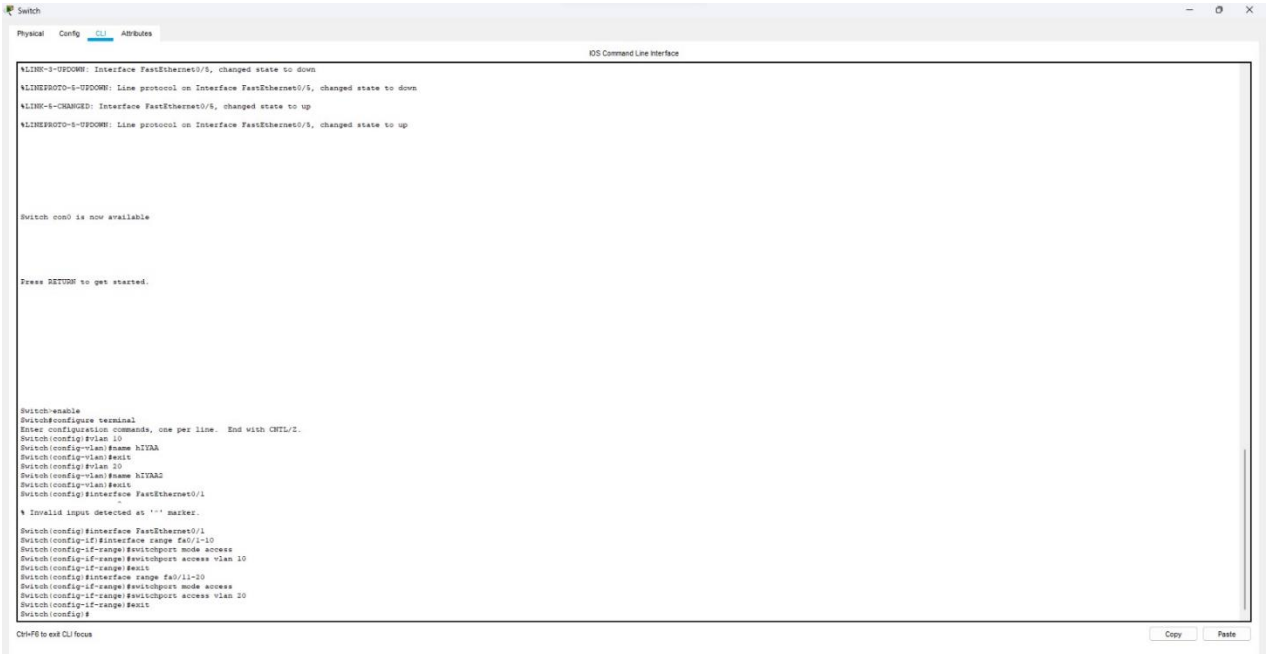
Aim: To implement the inter VLAN Routing using Cisco Packet Tracer.

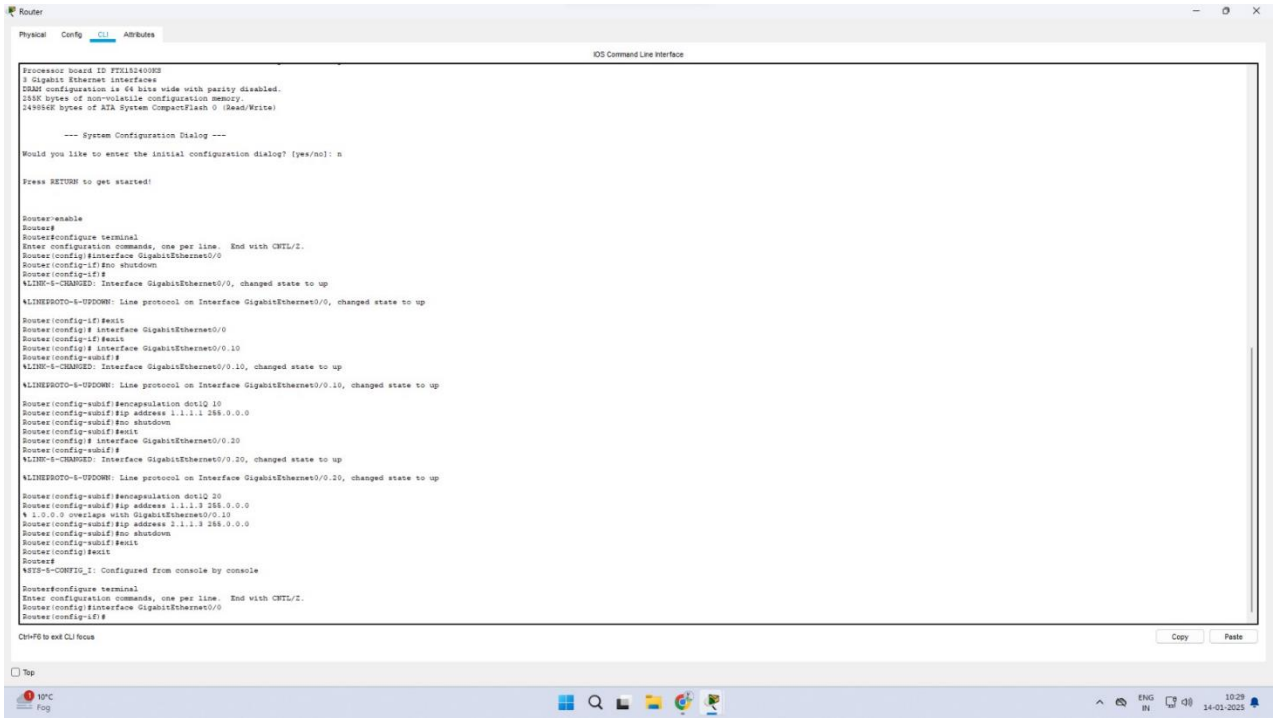
Theory: Inter-VLAN routing is necessary for enabling communication between devices in different VLANs. In this setup, two VLANs have been configured: VLAN hIYAA (VLAN 10) and VLAN hIYAA2 (VLAN 20). Devices in VLAN hIYAA have IP addresses in the subnet **1.1.1.0/24**, while devices in VLAN hIYAA2 use the subnet **2.1.1.0/24**. To enable communication between these VLANs, a router is connected to a switch using a single trunk link, following the "Router-on-a-Stick" method.

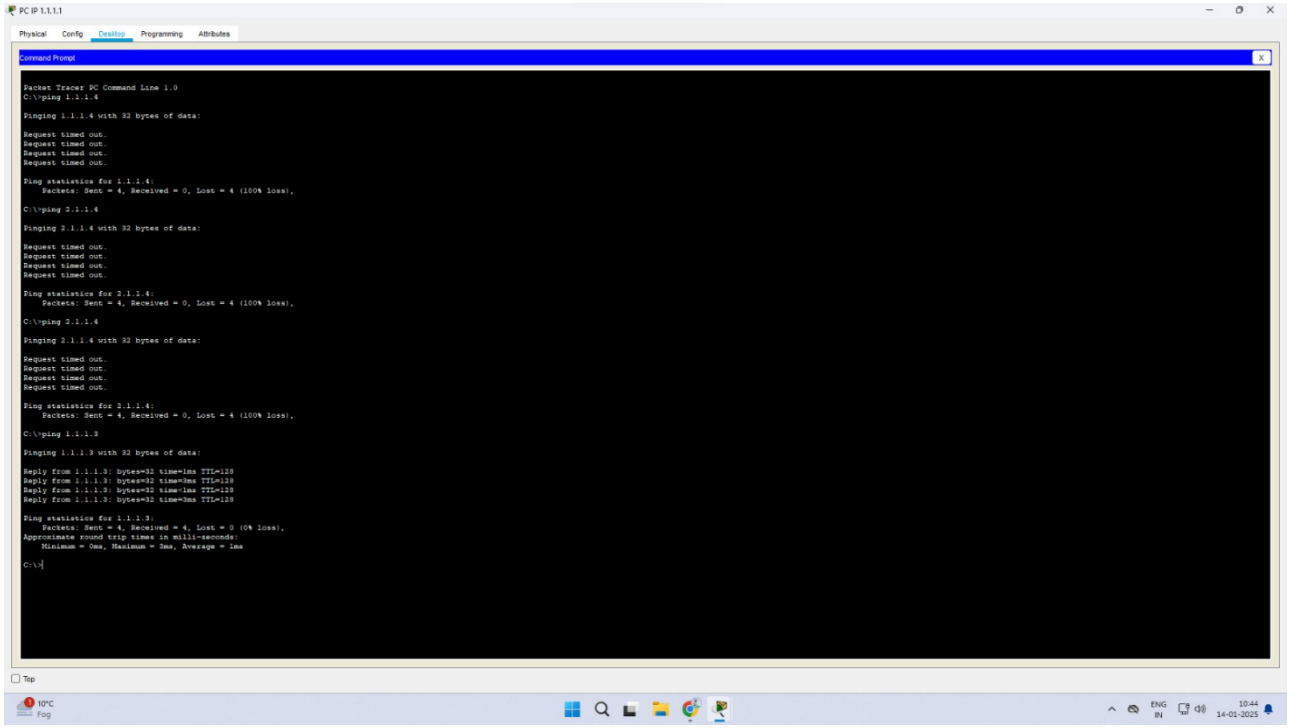
1. **VLAN Creation on the Switch:**
    - VLAN 10 (hIYAA) and VLAN 20 (hIYAA2) are created on the switch.
    - The switch ports connected to the devices in VLAN hIYAA are assigned to VLAN 10 using the **switchport access vlan 10** command. Similarly, ports connected to devices in VLAN hIYAA2 are assigned to VLAN 20.
2. **Router Configuration for Inter-VLAN Routing:**
    - A single physical interface on the router is used for both VLANs by creating sub-interfaces.
    - Sub-interface **Fa0/0.10** is created for VLAN 10 with the command **encapsulation dot1Q 10** and is assigned the IP address **1.1.1.1**.
    - Sub-interface **Fa0/0.20** is created for VLAN 20 with **encapsulation dot1Q 20** and is assigned the IP address **2.1.1.1**.
    - These IP addresses act as the default gateways for the respective VLANs.
3. **IP Address Assignment for End Devices:**
    - Devices in VLAN hIYAA are assigned IP addresses **1.1.1.2** and **1.1.1.3**, with the default gateway set to **1.1.1.1**.
    - Devices in VLAN hIYAA2 are assigned IP addresses **2.1.1.4** and **2.1.1.5**, with the default gateway set to **2.1.1.1**.
4. **Trunk Configuration on the Switch:**
    - The switch port connected to the router is configured as a trunk port using the **switchport mode trunk** command. This ensures that traffic from both VLANs is tagged and sent to the router.
5. **Testing Connectivity:**
    - After configuration, connectivity is tested by using the **ping** command. Devices in VLAN 10 should be able to communicate with devices in VLAN 20 through the router.

Observations:









Result: Successfully implemented the inter VLAN Routing using Cisco Packet Tracer