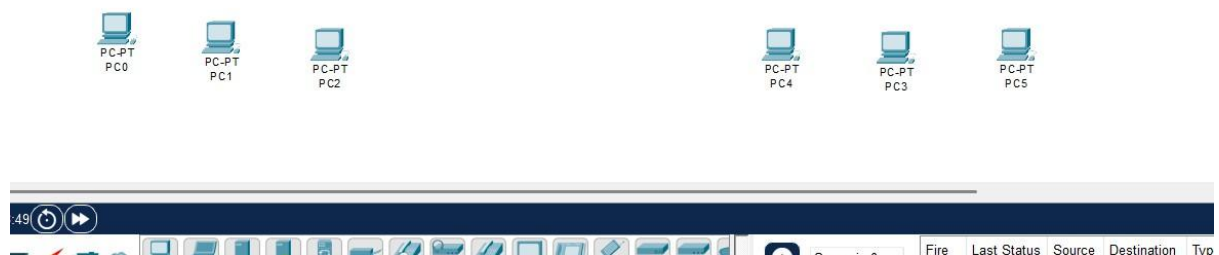


PRACTICAL-2

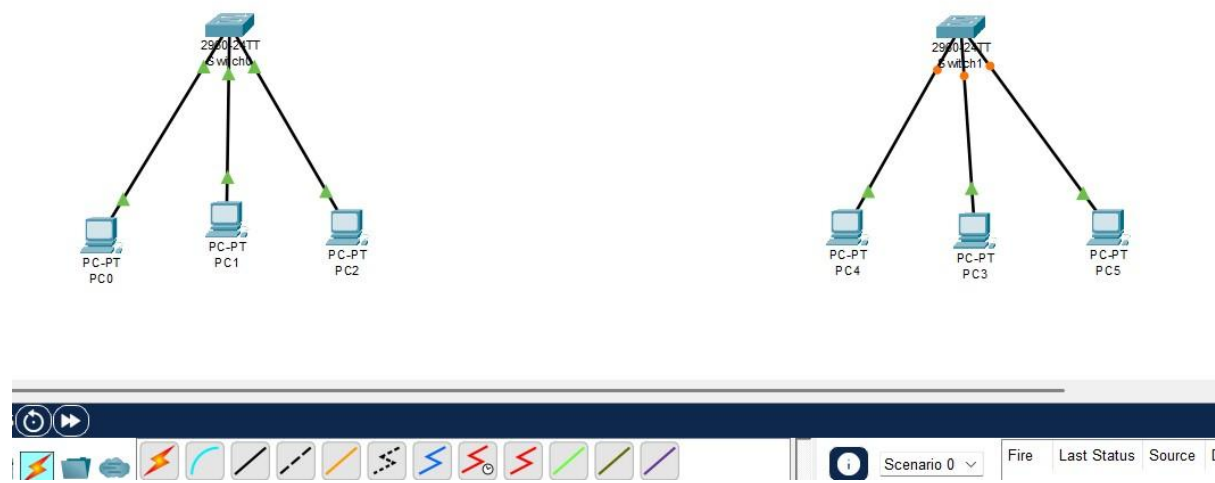
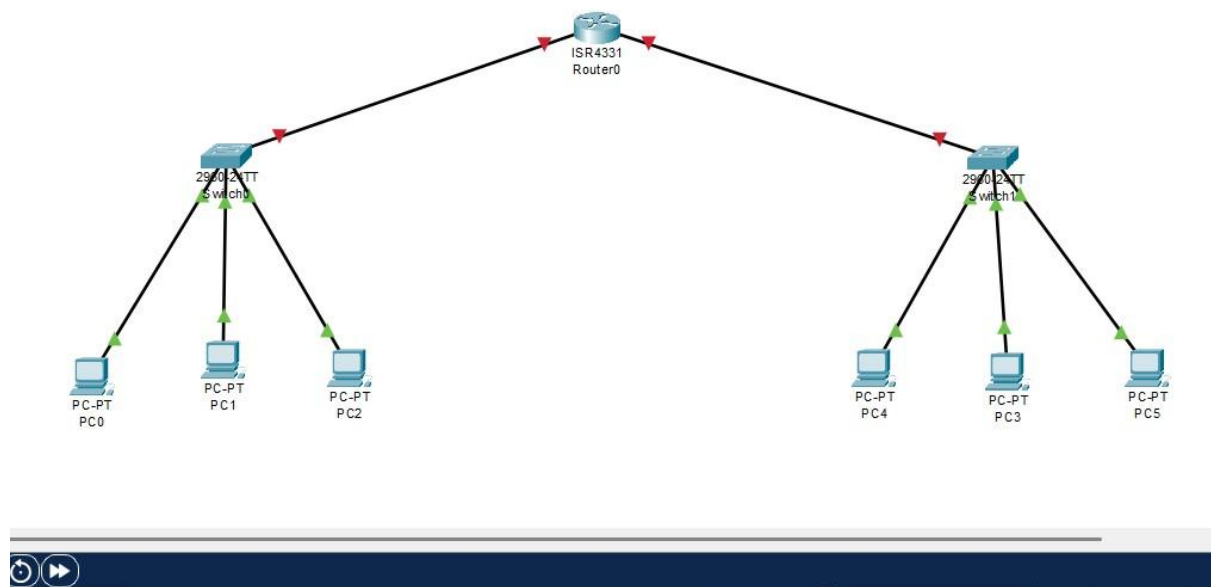
AIM: Simulate communication between two office branches located in different cities. Build a network that enables devices from both branches to exchange information reliably, and test whether data can travel seamlessly between the locations.

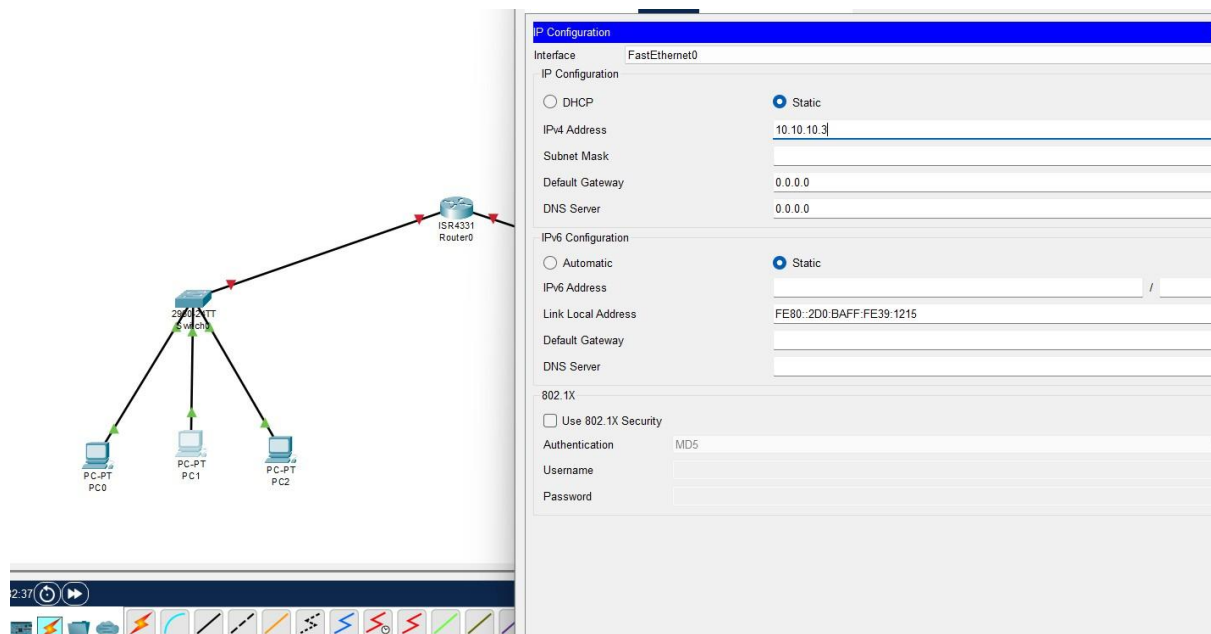
STEP-1: Add Devices for each cities



STEP-2: Put switch for each city.

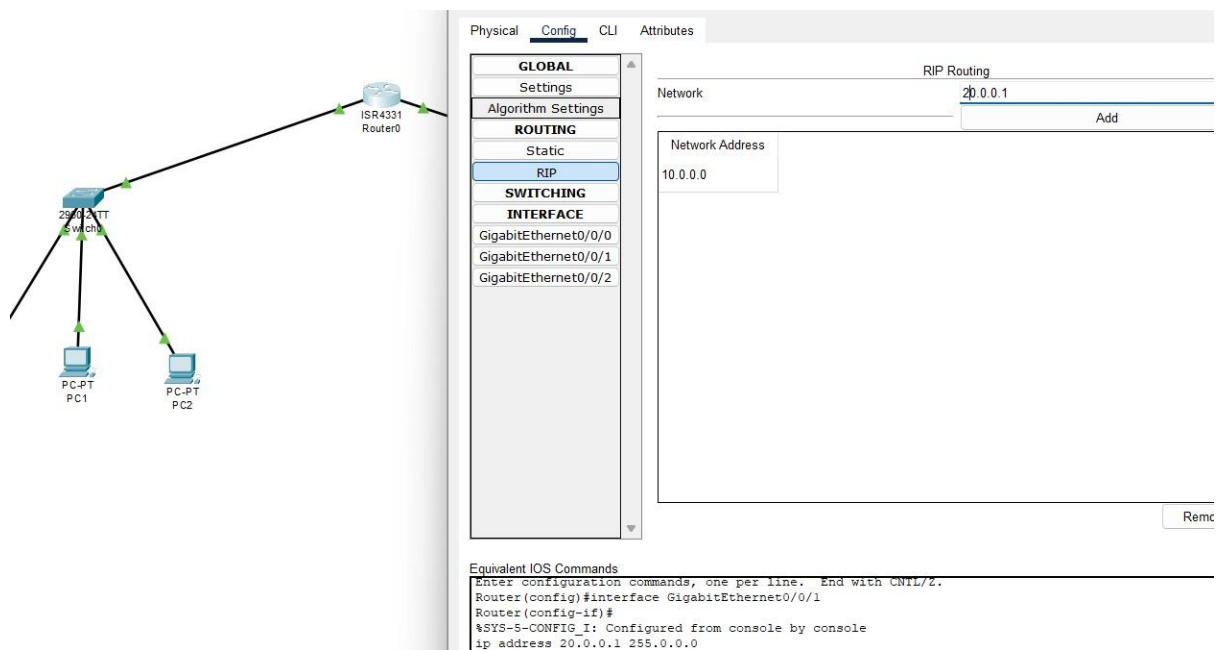


STEP-3: Connect device with switch.**Step-4:** Add a router and connect it with cable**STEP-5:** Assign Ip to all Devices



The image shows a network diagram on the left and a configuration window on the right. The diagram illustrates a central 2951X-TT switch connected to three PCs (PC0, PC1, PC2) and an ISR4331 Router0. The configuration window is titled 'IP Configuration' and shows the settings for the 'FastEthernet0' interface. The 'IP Configuration' section has 'Static' selected, with the IPv4 Address set to '10.10.10.3'. The 'IPv6 Configuration' section also has 'Static' selected, with the IPv6 Address set to 'FE80::2D0:BAFF:FE39:1215'. The '802.1X' section is expanded, showing 'Use 802.1X Security' as unchecked, 'Authentication' as 'MD5', and 'Username' and 'Password' fields.

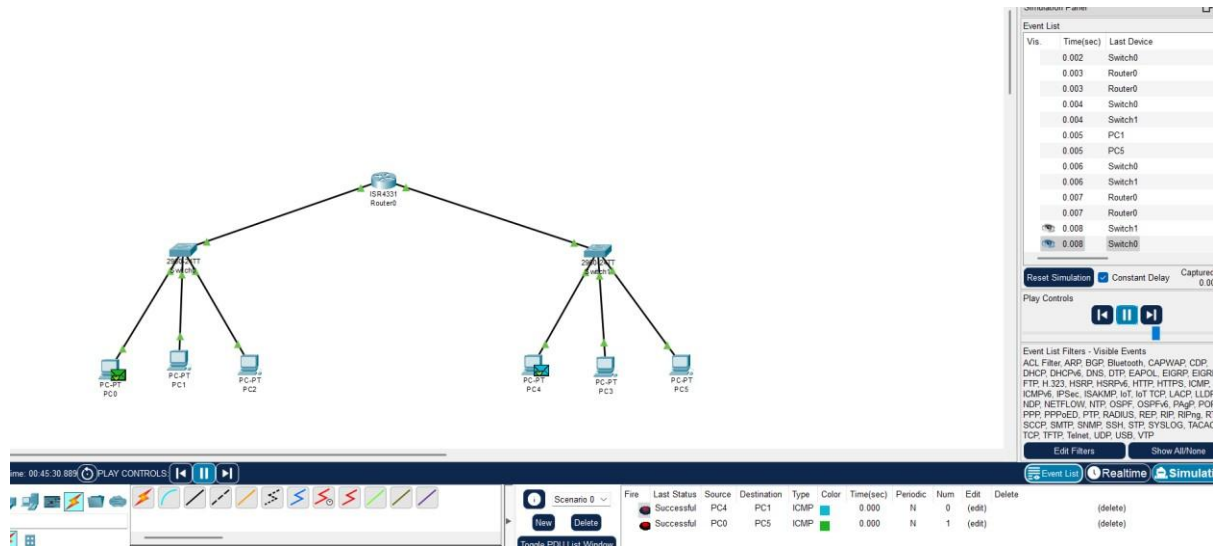
STEP-6: Give RIP value in Router.



The image shows a network diagram on the left and a configuration window on the right. The diagram illustrates a central 2951X-TT switch connected to two PCs (PC1, PC2) and an ISR4331 Router0. The configuration window is titled 'RIP Routing' and shows the settings for the 'GigabitEthernet0/0/1' interface. The 'Network' field is set to '20.0.0.1'. The 'Network Address' field is set to '10.0.0.0'. The 'Equivalent IOS Commands' section shows the following commands:

```
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface GigabitEthernet0/0/1
Router(config-if)#
%SYS-5-CONFIG_I: Configured from console by console
ip address 20.0.0.1 255.0.0.0
```

STEP-7: OUTPUT



Key Question:

- How does a router determine the next hop for a data packet?
 - A router determines the next hop by checking its **routing table**. It matches the packet's destination IP address with the most specific route in the table and forwards the packet to the corresponding **next-hop IP address** or **outgoing interface**.
- What is the structure and role of a routing table in Layer 3?
 - A routing table is a data structure in Layer 3 that stores routes to different network destinations. Each entry typically contains the **destination network**, **subnet mask**, **next-hop IP**, and **outgoing interface**. Its role is to guide routers in selecting the best path to forward packets toward their destination.
- How do ARP and routing tables work together in inter-network communication?
 - The **routing table** decides the next-hop IP address for forwarding a packet, while **ARP** resolves that next-hop IP into a MAC address for delivery over the local link. Together, they ensure packets are correctly forwarded across networks.

CONCLUSION:

In this simulation, two office branches in different cities were interconnected using switches and routers with RIP configuration. Devices were assigned IPs and successfully communicated across networks. This validates seamless end-to-end inter-branch communication through proper routing.