Assignment 1

Q)

Draw your Home Network Topology and explain how you are accessing the RPS Lab environment.

Home Network Topology

1. Network Devices:

- **Modem:** This device connects to the Internet Service Provider (ISP) via a coaxial cable. It translates the ISP's signal into data that can be understood by the router.
- **Router:** Connected to the modem, the router distributes the internet connection to various devices in the home. This can be through Ethernet cables (wired) or Wi-Fi (wireless).
- **Switch (Optional):** If the network requires more Ethernet ports than the router provides, a switch can be added. This device extends the number of available wired connections.
- **Devices:** Various devices such as desktop computers, laptops, smartphones, tablets, smart TVs, and IoT devices connect to the network.

2. Connections:

- **Wired Connections:** Ethernet cables run from the router (or switch) to devices such as desktops, gaming consoles, or smart TVs for a stable and fast connection.
- **Wireless Connections:** Most devices, including smartphones, tablets, laptops, and IoT devices, connect to the network via Wi-Fi.

- **Home Network Topology Diagram:**

```
  ISP
   |
  Modem
   |
  Router  -- (Wi-Fi) --> Smartphone
   |              --> Laptop
   |              --> Tablet
  (Ethernet)      --> Smart TV
   |
  Switch  (Optional)
```

```
         |
         |--- Desktop
         |--- Gaming Console
         |--- Printer
```

Q Explain how you are accessing the RPS Lab environment.

Ensure Network Access:
First, I verify that I have network access to the RPS Lab environment. This might involve connecting to a VPN or ensuring my IP address is whitelisted by the lab's network.

Obtain Credentials:
I secure the necessary login credentials, which typically include a username and password. These credentials are often provided by the lab administrator.

Access the Lab Environment:
Using my credentials, I log in to the RPS Lab environment. This could be through a web portal, SSH client, or another interface specified by the lab.

Navigate the Environment:
Once logged in, I navigate the environment to find the resources or tools I need. This might involve using a command-line interface or a graphical user interface, depending on the setup.

Verify Permissions:
I ensure that I have the necessary permissions to access the specific resources or perform the actions I need within the lab environment. If I encounter any access issues, I contact the lab administrator for assistance.

Perform Desired Actions:
I carry out the tasks I need to perform in the lab, whether that's running experiments, collecting data, or accessing specific applications.

Log Out:
After completing my tasks, I log out of the RPS Lab environment to ensure security and prevent unauthorized access.

Assignment 2:

Q) Identify a real-world application for both parallel computing and networked systems. Explain how these technologies are used and why they are important in that context

Real-World Applications in Simple Words

1. Parallel Computing:

Application: Weather Forecasting

How It's Used:

When meteorologists predict the weather, they use computers to run simulations that model the Earth's atmosphere. These simulations need to process a huge amount of data quickly, like satellite images and weather station reports.

Parallel computing means using many computer processors at the same time to handle different parts of this big task. Think of it like having a team of people working together on different pieces of a large puzzle all at once, rather than one person trying to do the whole puzzle by themselves.

Why It's Important:

- **Better Predictions:** More accurate weather forecasts help us plan our daily activities and prepare for severe weather.
- **Faster Results:** Quickly processing weather data means we get timely warnings about storms or other dangerous conditions.
- **Detailed Information:** It allows us to make more detailed predictions, which can be crucial for agriculture, travel, and outdoor events.

2. Networked Systems:

Application: Online Banking

How It's Used:

Online banking lets you manage your money from your computer or smartphone. This works because your device connects to your bank's servers over the internet. These servers handle your requests, like checking your balance or transferring money, and send the information back to you.

Networked systems include the technologies that keep these connections fast and secure. They ensure that your banking transactions are safe from hackers and that the system works smoothly, even if many people are using it at the same time.

Why It's Important:

- **Convenience:** You can do your banking anytime, anywhere, without going to a bank branch.
- **Efficiency:** It saves time and makes banking services quicker and more accessible.
- **Security:** Protects your money and personal information from cybercriminals.
- **Reliability:** Ensures the banking system is always available and can handle lots of users at once without crashing.

Summary

Parallel Computing: Weather Forecasting

Parallel computing helps weather forecasters use many computer processors at the same time to quickly and accurately predict the weather, providing better and faster information to keep us safe and informed.

Networked Systems: Online Banking

Networked systems make online banking possible by securely connecting your devices to your bank's servers, offering convenience, efficiency, and security for managing your finances.