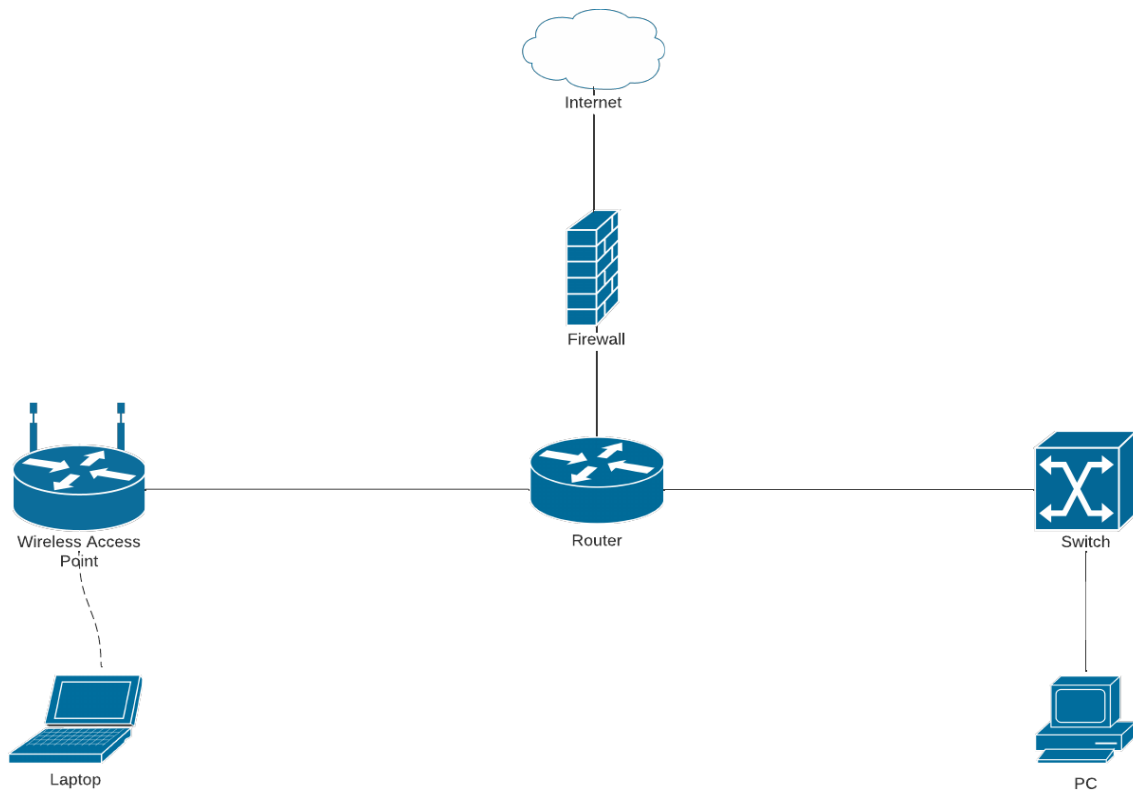# ASSIGNMENT – 01

1] Draw your home network topology and explain how you are accessing the RPS lab environment.

- ➢ Modem : This device connects your home network to the Internet Service Provider. It receives signals from the Internet Service Provider and translated them into data that the router can use to provide internet access to the device.
- ➢ Router : The router manages the traffic between the devices and the internet. It has several Ethernet ports for wired connections and broadcasts a wifi signal for wireless connections.
- ➢ Wired Devices : Some devices like desktop computers smart TV's etc are directly connected to the router via Ethernet cables for stable and faster connections.
- ➢ Wireless Devices : Some devices like laptops, smartphones, tablets etc are directly connected the router wirelessly using Wifi.

2] 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 word Application : Weather Forecasting.

Parallel computing :

Weather forecasting involves processing enormous amounts of data to predict weather patterns accurately. Parallel computing divides the computational tasks into smaller sub tasks that can be processed simultaneously by multiple processors or computing nodes. Each processor works on its own assigned tasks independently, and once all tasks are completed the results are combined to generate the final output.

For weather forecasting parallel computing allows meteorologists to analyze vast amounts of data, such as temperature, humidity, air pressure, and wind patterns, in parallel. This significantly reduces the time required for data processing and enables faster and more accurate weather predictions.

Parallel computing is essential in this context because it allows weather forecasting models to handle the massive amounts of data involved in predicting complex weather phenomena. Without parallel computing, the computational time required for weather forecasting would be prohibitively long, making real-time predictions impractical.

Importance of parallel computing:

- ➢ **Speed** : Parallel computing allows task to be completed faster by leveraging multiple computing resources simultaneously.
- ➢ **Scalability** : As the workload increases more computing resources can be added to handle the load without sacrificing performance.
- ➢ **Efficiency** : By distributing tasks efficiently parallel computing optimizes resource usage leading to cost saving and improved performance.

Networked Systems :

Weather forecasting also relies on networked systems to gather data from various sources, such as weather stations, satellites, radar systems, and ocean buoys. These data sources are spread across different geographical locations and are connected through networked systems.

Networked systems enable the seamless transmission of data from remote sensors to central processing centers, where the data is analyzed and used to generate weather forecasts. By connecting these disparate data sources, networked systems provide meteorologists with a comprehensive view of current weather conditions, allowing them to make more accurate

predictions it also facilitate the dissemination of weather forecasts to the public through various channels, such as websites, mobile apps, and television broadcasts.

Importance of Networked System:

- ➢ **Data Sharing** : Networked systems facilitate steaminess sharing of data and resources among different components of a system.
- ➢ **Communication** : They enable real time communication between different parts of a system allowing for efficient coordination and collaboration.
- ➢ **Scalability** : Networked system can scale horizontally by adding more nodes or devices to the network, allowing the system to handle increased loads and traffic.

In summary, the combination of parallel computing and networked systems in weather forecasting enables meteorologists to analyze vast amounts of data efficiently, make accurate predictions, and disseminate weather information to the public effectively. These technologies are essential for improving the accuracy and timeliness of weather forecasts, which is crucial for various industries, including agriculture, transportation, and emergency management.