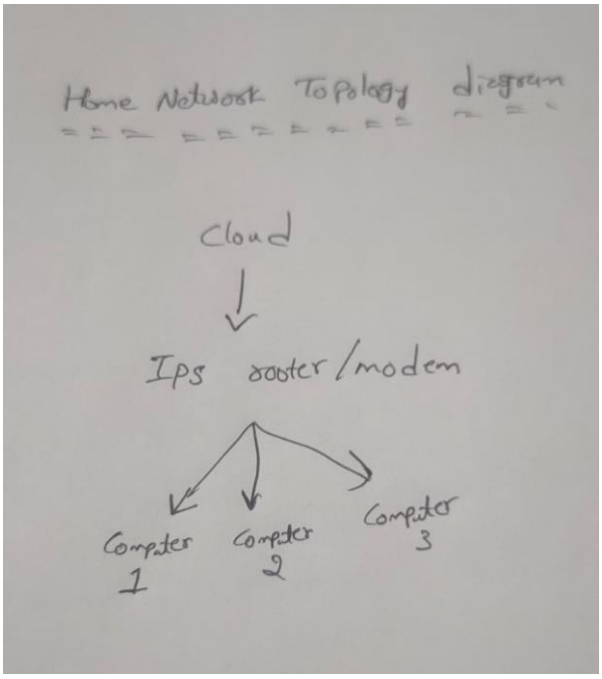
ASSIGNMENT – 1

1) **Draw your Home Network Topology and explain how you are accessingthe RPS Lab environment.**



In this diagram:

- **ISP Modem/Router**: This is our internet service provider's modem/router device, which connects our home network to theinternet.
- **Switch**: This is a networking device that allows multiple devices to connect to the network. It provides additional Ethernet ports for wiredconnections.
- When we attempt to access the cloud lab, our device sends a request toour router, which then goes out to the internet through our modem. Therequest travels across the internet to the cloud provider’s data center and reaches the specific server hosting our lab. The server processes therequest and sends the response back through the same path to our device.

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

Real-world application for parallel computing: Weather Forecasting

Weather forecasting involves complex simulations of atmospheric conditions, which require significant computational power. Parallel computing allows weather forecasting models to break down these simulations into smaller tasks that can be processed simultaneously across multiple computing nodes. Each node can handle a portion of the simulation independently, speeding up the overall computation. This enables meteorologists to produce more accurate andtimely weather forecasts, crucial for various industries like agriculture, transportation, and disaster preparedness.

Importance: Parallel computing enhances the scalability and efficiency ofweather forecasting models, enabling meteorologists to analyze larger datasets and run more complex simulations. This leads to improved forecast accuracy, which in turn helps decision-makers and the generalpublic make informed choices based on weather predictions, such as evacuating areas prone to natural disasters or optimizing crop plantingschedules.

Real-world application for networked systems: Online Retail

Explanation: In online retail, networked systems play a vital role in managing various aspects of the business, including inventory management, order processing, customer relationship management(CRM), and website hosting. These systems rely on networked infrastructure to communicate and exchange data in real-time. For example, when a customer places an order on an e-commerce website,networked systems handle the transaction processing, inventory updates, and shipping logistics seamlessly across multiple interconnected servers and databases.

Importance: Networked systems enable online retailers to provide a seamless and responsive shopping experience to customers, regardlessof the scale of operations. These systems facilitate efficient order processing, inventory tracking, and customer support, leading to increased customer satisfaction and loyalty. Additionally, networked systems allow retailers to scale their operations dynamically to meet changing demand, ensuring optimal performance during peak shoppingseasons or promotional events.