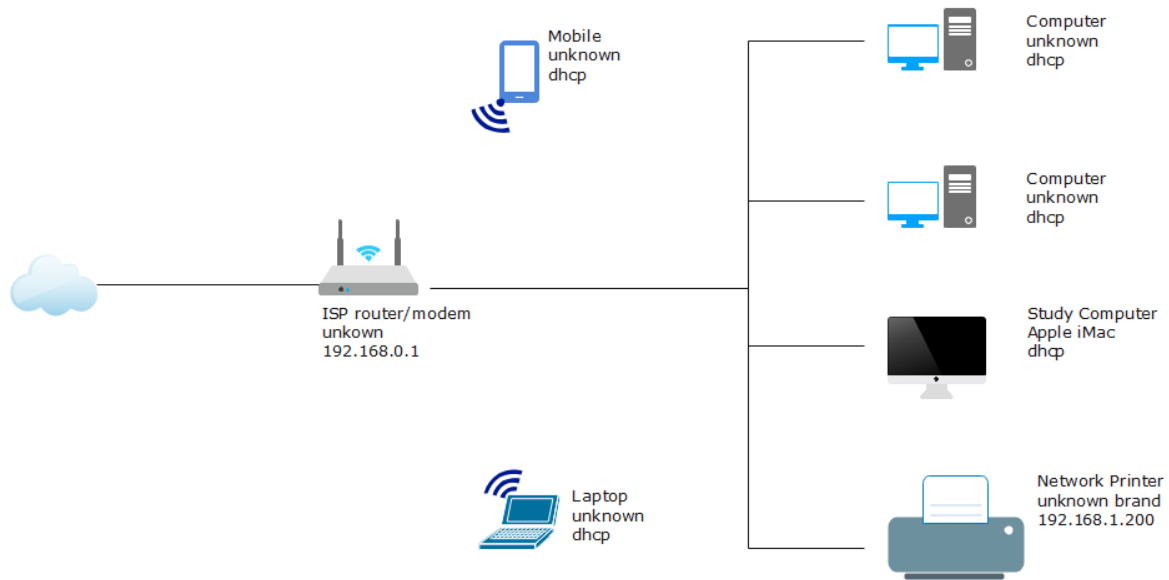


Assignment 1 & 2

1. Draw your Home Network Topology.



Modem: The connection starts from the internet service provider (ISP) which provides a modem. The modem is connected to the coaxial cable outlet or a phone line for DSL.

Router: The modem is connected to a router via an Ethernet cable. The router manages traffic between devices in the network and provides Wi-Fi access.

Devices:

- **Desktop Computer:** Connected to the router via an Ethernet cable for a stable and fast connection.
- **Laptop:** Connected to the router wirelessly via Wi-Fi.
- **Smartphone:** Connected to the router wirelessly via Wi-Fi.
- **Printer:** Connected to the router wirelessly via Wi-Fi.
- **Smart TV:** Connected to the router wirelessly via Wi-Fi.

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.

Parallel Computing:

Supercomputers for Astronomy: In the field of astronomy, supercomputers equipped with parallel processing capabilities play a crucial role. These supercomputers process vast amounts of data generated by telescopes and other observational instruments. By running complex calculations concurrently, they create detailed simulations of celestial bodies, analyze light spectra from distant stars, and search for patterns in massive datasets. For example, NASA's Pleiades supercomputer uses parallel processing to study dark matter and galaxy evolution.

Agricultural Predictions: Parallel computing is used in agriculture to analyze data quickly and accurately. By considering weather data, soil conditions, and other factors, farmers can make informed decisions about planting, irrigation, and harvesting. For instance, a supercomputer could analyze data from thousands of weather stations, satellite images, and soil samples to predict the optimal planting time for specific crops.

Networked Systems:

Collaborative Work Environments: Networked systems enable collaborative work environments. Whether it's remote teams, video conferencing, or shared document editing, networked systems facilitate seamless communication and collaboration across geographically dispersed individuals. **Databases and Data Mining:** Networked databases allow efficient storage, retrieval, and sharing of information. Data mining techniques leverage networked systems to extract valuable insights from large datasets. **Advanced Graphics and Virtual Reality:** Networked systems power advanced graphics, augmented reality, and virtual reality experiences. These technologies rely on fast data exchange between devices to create immersive visual environments.

Importance:

Parallel Computing: Parallel processing significantly speeds up computations, allowing us to solve complex problems faster. It's essential for scientific research, weather forecasting, and big data analytics. Without parallel computing, tasks like simulating galaxy evolution or predicting crop yields would be prohibitively slow.

Networked Systems: These systems connect people, devices, and resources globally. They enhance productivity, enable real-time collaboration, and facilitate seamless data sharing. Without networked systems, our modern interconnected world would be fragmented and less efficient.