Assignment 2:

Q1) 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

1.Real world application for Parallel Computing::-

* Weather forecasting

Usage - In weather forecasting huge data is being collected and processed after that it has to be computed in real time to show the result to the desired audience.

Importance –

* **Speed** : Weather forecasting requires timely predictions. Parallel processing significantly reduces the time it takes to process large data and run complex models, through which more accurate forecast is provided.
* **Accuracy**: By enabling more detailed and higher-resolution models, parallel processing improves the accuracy of weather predictions. Finer grid resolutions and more frequent data updates help in predicting local weather phenomena more precisely.
* **Handling Large Data Volumes**: The volume of weather data is enormous and continuously growing. Parallel processing allows for efficient handling and analysis of these large datasets, which would be impractical with sequential processing.
* **Real-time Processing**: In cases of severe weather events like hurricanes or tornadoes, real-time processing is crucial. Parallel processing ensures that updated forecasts can be generated quickly to aid in emergency response and public safety.

2.Real world application for Networked Systems:

* Real-Time Communication:

Usage- Player Interaction: Networked systems facilitate real-time communication between players. This includes chat systems, voice communication, and in-game messaging, all of which are essential for coordination in multiplayer games.

Server-Client Model: Multiplayer games typically use a server-client model where the game server manages the game state and clients (players' devices) communicate with the server to update their game state. This ensures that all players see the same game world and can interact with each other in real-time.

Importance-

* **Multiplayer Experience:** The core of online multiplayer gaming is the interaction between players. Networked systems make this possible by enabling real-time data exchange, ensuring that players can communicate, compete, and cooperate seamlessly.
* **Consistency and Reliability**: Networked systems ensure that all players have a consistent and synchronized view of the game world. This is crucial for fair play and enjoyable gaming experiences, as discrepancies in game state can lead to frustration and unfair advantages.
* **Global Reach**: Networked systems allow players from around the world to connect and play together. This global connectivity is a significant draw for multiplayer games, fostering diverse communities and enhancing the gaming experience