**Assignment No 02**

**Question:** 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: Weather Forecasting**

**Application**: Weather forecasting is a critical real-world application that heavily relies on parallel computing. Meteorologists use complex mathematical models to simulate the Earth's atmosphere, requiring vast amounts of data and extensive computations.

**How it is used**: Parallel computing allows meteorological models to run on supercomputers with thousands of processors working simultaneously. These processors handle different parts of the computation, such as dividing the Earth’s atmosphere into smaller regions and calculating weather variables for each region concurrently. This division allows for more detailed and accurate predictions.

**Importance**:

* **Accuracy**: Parallel computing enables the processing of large datasets in a reasonable timeframe, leading to more accurate weather predictions.
* **Speed**: Faster computations mean that forecasts can be generated quickly, which is crucial for timely weather warnings and emergency responses.
* **Complexity**: It allows for the use of more sophisticated models that can simulate intricate weather patterns and phenomena.

**Networked Systems: Online Banking**

**Application**: Online banking is a prime example of networked systems in action. It involves the interaction of various interconnected computer systems to facilitate financial transactions over the internet.

**How it is used**: Networked systems in online banking include client-server architectures, databases, and secure communication protocols. When a user accesses their bank account online, their request is sent through a network to the bank’s server. The server processes the request, interacts with the bank’s database, and sends back the necessary information or confirmation of transactions.

**Importance**:

* **Accessibility**: Networked systems make banking services available to customers 24/7 from anywhere in the world.
* **Security**: They enable secure transactions through encryption and other cyber security measures, protecting sensitive financial data.
* **Efficiency**: Automated processes and real-time transaction processing improve the efficiency of banking operations, reducing the need for physical bank visits and paperwork.