**Assignment-2**

1. 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.

**Solution:**

One real-world application that utilizes both parallel computing and networked systems is weather forecasting.

**Networked Systems**: Weather data is collected from a vast network of sensors around the globe. These sensors include ground stations, buoys, satellites, and even aircraft. The collected data includes temperature, pressure, humidity, wind speed, and direction. This network of sensors allows for comprehensive data gathering, capturing weather patterns across vast geographical areas.

**Parallel Computing:** Weather forecasting relies on complex computer models that simulate atmospheric conditions. These models involve massive datasets and intricate calculations. By distributing the workload across multiple processors in parallel computing systems, meteorological agencies can process these models much faster. This allows for:

**Higher Resolution Forecasts:** Parallel computing enables models to incorporate more data points, leading to more accurate and detailed weather predictions.

**Faster Simulations:** Running simulations on multiple processors significantly reduces processing time, allowing for more frequent updates and forecasts that are closer to real-time.

**Ensemble Forecasting:** Parallel computing facilitates running multiple simulations with slightly different initial conditions. This "ensemble forecasting" approach helps assess the likelihood of various weather scenarios.

**Importance of the Combination:**

The synergy of networked systems and parallel computing is crucial for modern weather forecasting. The vast network provides the essential data, while parallel computing allows for processing this data to generate comprehensive and timely weather forecasts. This combination is vital for various purposes, including:

**Public Safety**: Accurate weather forecasts can warn communities of impending severe weather events, allowing them to take precautions and minimize loss of life and property damage.

**Agriculture:** Farmers can use weather forecasts to plan their planting and harvesting schedules, optimizing crop yields and reducing losses due to unexpected weather conditions.

**Aviation:** Accurate weather forecasts are essential for safe air travel, allowing airlines to plan routes and avoid hazardous weather conditions.

The collaboration between networked systems for data collection and parallel computing for processing empowers modern weather forecasting to provide crucial information impacting public safety, agriculture, aviation, and many other sectors.