

## Assignment 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.

**Ans:-** Parallel computing and networked systems are foundational technologies that support many modern applications, each playing a crucial role in specific contexts. Here's how they are applied in real-world scenarios:

### **Parallel Computing: Weather Forecasting**

**Application:** Weather forecasting is a significant real-world application of parallel computing. Advanced weather prediction models involve complex mathematical simulations that account for numerous variables such as temperature, pressure, humidity, wind speeds, and ocean currents.

**How It's Used:** In weather forecasting, parallel computing is employed to run these simulations much faster than would be possible on a single processor. By dividing the tasks across multiple processors in a parallel computing environment, each processor can handle a subset of the calculations. This is especially crucial for tasks like predicting storm paths, rainfall, or temperature variations over large geographical areas.

**Importance:** The speed gained by using parallel computing is essential for timely and accurate weather predictions, which are critical for disaster preparedness and response, agriculture, transportation, and daily public and commercial activities. Faster and more accurate weather models can save lives by giving earlier warnings for severe weather events like hurricanes, tornadoes, and blizzards.

## **Networked Systems: E-Commerce**

**Application:** E-commerce platforms like Amazon, eBay, and Alibaba are prime examples of networked systems in action. These platforms facilitate online transactions among users scattered across different geographical locations.

**How It's Used:** Networked systems in e-commerce connect numerous computers and servers across the Internet to manage and process a myriad of tasks such as user queries, transactions, data storage, and content delivery. They ensure that the e-commerce platform can handle vast amounts of data, support complex interactions among users, and integrate with other services like payment gateways and shipping services.

**Importance:** Networked systems are crucial for the scalability and reliability of e-commerce platforms. They enable these platforms to serve millions of simultaneous users around the world, manage inventory, provide customer service, and process transactions securely. This connectivity is essential for the global reach of modern commerce, enabling businesses to expand their markets far beyond local boundaries and providing consumers with a broad array of products.

Both parallel computing and networked systems are indispensable in their respective applications due to their ability to handle large-scale computations and data exchanges efficiently. Their roles in weather forecasting and e-commerce highlight how critical these technologies are in managing complex, real-time information and services on a global scale.