**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.

**ANSWER:**

**1.Parallel Computing:**

Parallel computing involves dividing a large problem into smaller tasks that are solved simultaneously to speed up processing.

**Example 1: Weather Forecasting:**

**How It’s Used:** Supercomputers process vast amounts of atmospheric data simultaneously to predict weather conditions.

**Importance:** Enables early warnings for storms, saving lives and property.

**Example 2: Scientific Research:**

**How It’s Used:** Simulating complex phenomena, like protein folding or climate modelling, byperforming multiple calculations simultaneously.

**Importance:** Accelerates discoveries and improves the accuracy of results.

**Example 3: Video Rendering:**

**How It’s Used:** Parallel processors render multiple frames or parts of a video simultaneously.

**Importance:** Reduces the time needed to create high-quality animations or visual effects.

**Example 4: Gaming:**

**How It’s Used:** Gaming consoles and PCs use parallel processors to render graphics and physics simulations in real time.

**Importance:** Enhances user experience by providing smooth and realistic gameplay.

**Example 5: Cryptocurrency Mining**

**How It’s Used:** Mining rigs perform complex mathematical calculations in parallel to validate blockchain transactions.

**Importance:** Ensures the security and functioning of cryptocurrencies.

**2.Networked Systems:**

Networked systems connect multiple devices or computers to share resources and information efficiently.

**Example 1: Online Banking:**

**How It’s Used:** Banks connect ATMs, apps, and computers to central servers for real-time transactions.

**Importance:** Provides convenience and security for users.

**Example 2:E-Commerce (e.g., Amazon, Flipkart)**

**How It’s Used:** Servers handle millions of user requests to browse, purchase, and track orders.

**Importance:** Ensures seamless shopping experiences globally.

**Example 3: Social Media Platforms:**

**How It’s Used:** Platforms like Facebook and Instagram connect users worldwide for communication and media sharing.

**Importance:** Facilitates global interaction and content sharing.

**Example 4: Smart Cities:**

**How It’s Used:** Systems like traffic management, energy grids, and surveillance networks are interconnected to manage urban infrastructure.

**Importance:** Enhances urban planning and improves the quality of life.

**Example 5: Telemedicine:**

**How It’s Used:** Doctors and patients use networked systems for video consultations, remote diagnoses, and accessing medical records.

**Importance:** Provides healthcare access to remote and underserved areas.