Module 2 – Introduction to Programming (C Language) Practical Exercises

1. Research and provide three real-world applications where C programming is extensively used, such as in embedded systems, operating systems, or game development.

1. Embedded Systems

- C is the most widely used language in **microcontrollers and embedded systems** because of its speed and efficiency.
- Devices like **washing machines, microwave ovens, medical equipment, automotive systems (ABS, airbags), and IoT devices** often use C.
- C provides direct access to hardware (through pointers and memory management), making it ideal for **low-level programming** required in embedded systems.

2. Operating Systems

- Many famous operating systems like **UNIX, Linux, Windows Kernel, and macOS** are either fully written or partly written in C.
- The **Linux Kernel**, one of the most popular OS kernels in the world, is almost entirely written in C.
- C is used here because it provides **high performance, portability, and direct hardware interaction**, which are crucial for OS development.

3. Game Development

- Early **video games and graphics engines** were written in C due to its speed and ability to interact with hardware efficiently.
- Even today, popular **game engines (like Unity and Unreal Engine)** have their performance-critical parts written in C/C++.

- Games require **fast execution and memory management**, and C provides the control needed for rendering graphics, handling physics, and optimizing performance.

Summary :-

C is still extremely relevant because it runs **close to hardware**, is **fast**, and provides **precise control over system resources**. This is why it powers embedded systems, OS kernels, and even modern game engines.