Object-Oriented Programming (OOP) Concepts in C++

Introduction to OOP

Object-Oriented Programming is a programming paradigm that organizes code into objects, each representing an instance of a class. C++ is a powerful language that supports OOP principles, provideng features like encapsulation, inheritance, and polymorphism.

1. Classes and Objects

- **Class**: A blueprint or template for creating objects. It defines the properties and behaviors common to all objects of the same type.
- **Object**: An instance of a class. It encapsulates data and behavior specified by its class.

2. Encapsulation

- **Encapsulation**: The bundling of data (attributes) and functions (methods) that operate on the data into a single unit, known as a class. It hides the internal details and exposes only what is necessary.

3. Inheritance

- **Inheritance**: The ability of a class to inherit properties and behaviors from another class. It promotes code reusability and establishes a "is-a" relationship between classes.

5. Abstraction

- **Abstraction**: The process of simplifying complex systems by modeling classes based on their essential features. It involves hiding unnecessary details and exposing only relevant information