**Assignment: 3 / Module 4**

**OOPS Concept**

## What is OOP? List OOP Concept

* OOP stands for Object-Oriented Programming. It is a programming paradigm that uses "objects" to design and organize code. Here are some key OOP concepts:

1. **Class**: A blueprint for creating objects. It defines the properties (attributes) and behaviors (methods) that all objects of the class will have.
2. **Object**: An instance of a class. It represents a real-world entity and encapsulates both data (attributes) and behavior (methods).
3. **Encapsulation**: The bundling of data (attributes) and methods that operate on the data into a single unit (class). It hides the internal state of an object from the outside world and only exposes the necessary functionality through public interfaces.
4. **Abstraction**: The process of simplifying complex systems by modeling them at a higher level of detail. In OOP, abstraction allows us to focus on the essential characteristics of an object while hiding the irrelevant details.
5. **Inheritance**: A mechanism that allows a class (subclass or derived class) to inherit properties and behaviors from another class (superclass or base class). It promotes code reusability and supports the concept of "is-a" relationships.
6. **Polymorphism**: The ability of objects to take on different forms or behaviors depending on the context. In OOP, polymorphism allows objects of different classes to be treated as objects of a common superclass through method overriding and method overloading.
7. **Message Passing**: The mechanism by which objects communicate with each other by sending and receiving messages. In OOP, message passing occurs when one object invokes a method on another object to perform a certain task.
8. **Association**: A relationship between two or more classes that describes how they are connected or related to each other. Associations can be one-to-one, one-to-many, or many-to-many, and they are represented by instance variables or references in the participating classes.