**Core Java - Assignment**

**Module - 1**

1. **Inheritance and Polymorphism :**

**Theory : -**

1. Inheritance Types and Benefits :

-> Types of Inheritance

1. Single Inheritance: A class inherits from only one parent class.
2. Multilevel Inheritance :A chain of inheritance where a class inherits from a parent class, which itself is a subclass of another class.
3. Hierarchical Inheritance : Multiple classes inherit from a single parent class.

4. Multiple Inheritance: A class inherits from multiple parent classes.

-> Not directly supported in Java but can be achieved using interfaces.

Benefits :

-> Code Reusability: Avoids redundant code by inheriting properties and behaviors from a parent

class.

-> Code Maintainability: Changes made to the parent class are automatically reflected in the

child classes, making code maintenance easier.

-> Code Organization: Helps organize classes into a hierarchical structure, reflecting real-world

relationships.

-> Polymorphism: Enables objects of different classes to be treated as objects of a common

type.

1. Method Overriding : In object-oriented programming, method overriding is a powerful concept where a subclass provides its own specific implementation for a method that is already defined in its superclass.
2. Dynamic Binding (Run-Time Polymorphism) :

-> In object-oriented programming, dynamic binding, also known as late binding or runtime polymorphism, is the process of determining the specific implementation of a method at runtime, based on the actual type of the object being referred to, rather than the declared type of the reference variable.

1. Super Keyword and Method Hiding :

-> To access members (variables and methods) of the superclass within a subclass.

-> To invoke the superclass's constructor from the subclass constructor.

Method Hiding : When a subclass declares a static method with the same name, return type, and

parameters as a static method in its superclass.

-> Method hiding occurs at compile time.

-> The static method in the subclass hides (not overrides) the static method in the superclass.