 Aror University of Art, Architecture, Design & Heritage Sukkur.

Department of Artificial Intelligence and Multimedia Gaming

Object Oriented Programming(Spring-2024)

LAB No. 10

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Objective of Lab No. 10:
After performing lab10, students will be able to:
- o   Implement Interfaces in Java
- o   Achieve Multiple Inheritance in Java
- o   Use Inheritance among Interfaces
- o   Use default and static methods of Interfaces

Lab Exercises:

1. Interface Implementation:
- • Define an interface Shape with methods calculateArea() and calculatePerimeter().
- • Implement the Shape interface with classes Circle and Rectangle.
- • Test the implementation by creating instances of Circle and Rectangle and calling their methods.

2. Multiple Inheritance using Interfaces:
- • Define an interface Attack with a method attack() that returns the damage dealt.
- • Define an interface Defend with a method defend() that returns the damage reduced.
- • Create a class Warrior that implements both Attack and Defend interfaces.
- • Implement attack() to return a random value representing the attack power.
- • Implement defend() to return a random value representing the defense power.
- • Create an instance of Warrior and simulate a battle by calling attack() and defend() methods, displaying the outcome of each action.

3. Inheritance in Interfaces:
- • Define an interface Animal with a method eat().
- • Define a sub-interface Mammal that extends Animal and adds a method giveBirth().
- • Implement the Mammal interface with a class Dog.
- • Test the eat() and giveBirth() methods of Dog.

4. **Default Methods in Interfaces:**
   - Define an interface Logger with a default method log(String message).
   - Create a class ConsoleLogger that implements Logger.
   - Implement the log() method in ConsoleLogger to print the message to the console.
   - Demonstrate the usage of ConsoleLogger to log messages.

5. **Static Methods in Interfaces:**
   - Define an interface MathUtils with a static method double square(double number).
   - Implement MathUtils with a class Calculator.
   - Implement the square() method in Calculator to return the square of a number.
   - Use the square() method of Calculator to calculate and display the square of a given number.