Department of Artificial Intelligence and Multimedia Gaming

Object Oriented Programming(Spring-2024)

LAB No. 7

Prepared by: Abdul Haseeb Shaikh

Objective of Lab No. 7:
After performing lab7, students will be able to:

- Implement Multilevel Inheritance in java.
- Use Inheritance to achieve run time polymorphism.
- Use super keyword
- Create a basic JFRAME form

Lab Exercises:

1. Multilevel Inheritance:

a. Define a class named Message that contains an instance variable of type String named text that stores any textual content for the Message. Create a method named toString that returns the text field and also include a method to set this value.

b. Next, define a class for SMS that is derived from Message and includes instance variables for the recipientContactNo. Implement appropriate accessor and mutator methods. The body of the SMS message should be stored in the inherited variable text. Redefine the toString method to concatenate all text fields.

c. Similarly, define a class for Email that is derived from Message and includes an instance variable for the sender, receiver, and subject. The textual contents of the file should be stored in the inherited variable text. Redefine the toString method to concatenate all text fields.

d. Create sample objects of type Email and SMS in your main method. Test your objects bypassing them to the following subroutine that returns true if the object contains the specified keyword in the text property.

2. Method Overriding/Run Time Polymorphism:

Task 01:

a. Create an Employee class with a method calculateSalary() that returns a base salary.
b. Create subclasses Manager and Worker that override the calculateSalary() method to calculate the salary based on different criteria for each type of employee.
c. Write a program that demonstrates method overriding by creating instances of Employee, Manager, and Worker, and calling their calculateSalary() methods.

Task 02:

a. Create a BankAccount class with a method getInterestRate() that returns 0.05 (5%).
b. Create a subclass SavingsAccount that overrides the getInterestRate() method to return 0.1 (10%).
c. Write a program that demonstrates method overriding by creating instances of BankAccount and SavingsAccount, and calling their getInterestRate() methods.

3. Usage of Super Keyword:

a. Create a class Animal with instance variables name and age, and a constructor to initialize them.
b. Create subclasses Dog and Cat that extend Animal.
c. In the constructors of Dog and Cat, use the super keyword to call the constructor of Animal to initialize the name and age variables.
d. Write a program that demonstrates the use of super by creating instances of Dog and Cat, and printing their name and age.

4. JFRAME Form:

a. Create a netbeans project named: “MyFirstGUI”
b. Add a package called myfirstgui
c. Inside the package add a JFRAME form called MainUI
d. Now Add a Button on this form
e. Upon clicking the button the background color changes to yellow, and a count of clicks appeas which is 1 for first time, 2 for second and so on

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