B.E.CSE-III- sem-P-batch (session – August-Dec-2024)

Preparatory Exercises for Java Lab session – 3

Topics: Classes, Methods, Static, Access Specifiers (public, private), *this* keyword

1. Create a class called ***Mobile*** that includes three instance variables—a *brand* (type String), a *year* (type String) and a *price* (float). Provide a constructor that initializes the three instance variables. Provide a *set* and a *get* method for each instance variable. If the price is < 5000, do not set its value. Write a test app named *MobileApp* that demonstrates class *Mobile*'s capabilities. Create two *Mobile* objects and display each object's price in a separate *Display*() method. Then give each Mobile a 5% and 7% discount on the price and display their price again.

2. Create a program to add, subtract and multiply two complex numbers. There are two instance variables *real* and *imaginary* and both are of *int* type. Get input from user as command line arguments, for the two complex numbers (Ex: i/p = 1, 2 ; o/p = 1+2i). Create three instance methods one each for add, subtract, multiply to perform the corresponding operation. Use a separate method *Display*() for displaying the result of different operations.

3. Using *static* variables and *static* methods within a class.

   Create class *SavingsAccount*. Use a static variable *annualInterestRate* to store the annual interest rate for all account holders. Each object of the class contains a *private* instance variable *savingsBalance* indicating the amount the saver currently has on deposit. Provide method *calculateMonthlyInterest* to calculate the monthly interest by multiplying the *savingsBalance* by *annualInterestRate* divided by 12—this interest should be added to *savings-Balance*. Provide a *static* method *modifyInterestRate* that sets the *annualInterestRate* to a new value. Write a program to test class *SavingsAccount*. Instantiate two *SavingsAccount* objects, *saver1* and *saver2*, with balances of Rs. 2000.00 and Rs. 3000.00, respectively. Set *annualInterestRate* to 4%, then calculate the monthly interest for each of 12 months and print the new balances for both savers. Next, set the *annualInterestRate* to 5%, calculate the next month's interest and print the new balances for both savers.

4. Demonstrate the first program using different combinations of *public*, *private* access specifiers.
   - all public methods and public variables,
   - all private methods and private variables
   - some private methods and some public variables and vice-versa

5. Using '*this*' keyword, wherever suitable in any of the above programs, either in the constructor methods and/or the getter and setter methods.

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