Java Activity

ACTIVITY 1:

Given shape may be of triangle, square or rectangle. Write a program to calculate the area of the given shape with given inputs as below: (use polymorphism)
(a) Triangle (base & height) (formula A = hb/2)
(b) Square (side) (formula A = a^2)
(c) Rectangle (length & width) (formula A = l*b)
(d) Trapezoid (base1, base2 & height) (formula A=(b1+b2)*h/2)
(e) Circle (π ,radius) (formula A= πr square)

ACTIVITY 2:

Write program as below with Inheritance & polymorphism. Include interface as well

(a) Create a super class called Car that has the field (speed, regularPrice & color) and method (getSalePrice())
(b) Create a sub-class1 "SUV" of Car class that has the field (weight) and methods (getSalePrice()); //If weight > 2000, 10% discount. Otherwise 20% discount
(c) Create a sub-class2 "Sedan" of Car class that has the fields (year & manufacturerDiscount) and methods (getSalePrice()); //From the saleprice computed from Car class, subtract the manufacturer Discount
(d) Create MyOwnAutoShop class which contains the main() method that performs the following:

- Create two instances of the Sedan class and initialize all the fields with appropriate values. Use the constructor for initializing the fields of the super class.
- Create an instance of Suv class and initialize all the fields with appropriate values.
  Display the sale prices of all instances.

ACTIVITY 3:

Create class "SavingsAccount". Use a static variable annualInterestRate (double) to store the annual interest rate for all account holders. Each object of the class contains a private instance variable savingsBalance (double) indicating the amount the customer 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 savingsBalance. Provide a static method modifyInterestRate that sets the annualInterestRate to a new value. Write a program to test class SavingsAccount. Instantiate two savingsAccount objects, Customer1 and Customer2, with two different balances, respectively. Set annualInterestRate to 4%, then calculate the monthly interest and print the new balances for both customers. Then set the annualInterestRate to 5%, calculate the next month’s interest and print the new balances for both customers. (use inheritance)

Common Points:

1. **Given problem statements sets the context of the program & it’s indicative**
2. **Use the given mechanism as needed**
3. **Apply the mechanisms perfectly to blend the execution of the program**
4. **Use your thought process to enhance the program without deviating the context**
5. **Follow the programming practices & coding standards**