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Class: Object Oriented Programming

Assignment: Lab Task 4

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Task 1:

Create a SavingsAccount class. Use a static data member annualInterestRate to store the

annual interest rate for each of the savers. Each member of the class contains a private data

member savingsBalance indicating the amount the saver currently has on deposit. Provide

member function calculateMonthlyInterest that calculates the monthly interest by

multiplying the saving balance by annualInterestRate divided by 12; this interest should be

added to savingsBalance.

Provide a static member function modifyInterestRate that sets the static annualInterestRate

to a new value.

Write a driver program to test class SavingsAccount. Instantiate two different objects of

class SavingsAccount, saver1 and saver2, balances of 2000.00 and 3000.00, respectively.

Set the annualInterestRate to 3 percent. Then calculate the monthly interest and print the

new balances for each of the savers.

Then set the annualInterestRate to 4 percent, calculate the next month&#39;s interest and print the

new balances for each of the savers.

**CODE:**

public class Lab4\_Task1 {  
  
 public static void main(String[] args) {  
  
 SavingsAccount Saver1 = new SavingsAccount(2000);  
 SavingsAccount Saver2 = new SavingsAccount(3000);  
  
 Saver1.calculateMonthlyInterest();  
 Saver2.calculateMonthlyInterest();  
  
 System.*out*.println("Saver 1 Monthly Balance : "+Saver1.getSavingBalance() );  
 System.*out*.println("Saver 2 Monthly Balance : "+Saver2.getSavingBalance() );  
  
 SavingsAccount.*modifyIR*(3);  
  
 Saver1.calculateMonthlyInterest();  
 Saver2.calculateMonthlyInterest();  
  
 System.*out*.println("Changing Annual Interest Rate to 3");  
 System.*out*.println("Saver 1 Monthly Balance : "+Saver1.getSavingBalance() );  
 System.*out*.println("Saver 2 Monthly Balance : "+Saver2.getSavingBalance() );  
  
 SavingsAccount.*modifyIR*(4);  
  
 Saver1.calculateMonthlyInterest();  
 Saver2.calculateMonthlyInterest();  
  
 System.*out*.println("Changing Annual Interest Rate to 4");  
 System.*out*.printf("Saver 1 Monthly Balance : %.2f \n",Saver1.getSavingBalance() );  
 System.*out*.println("Saver 2 Monthly Balance : "+Saver2.getSavingBalance() );  
  
 }  
  
  
}  
  
class SavingsAccount{  
  
 public static float *AnnualInterestRate*;  
 private float SavingBalance;  
  
 *//Getters For Private Attributes* public static float getAnnualInterestRate() {  
 return *AnnualInterestRate*;  
 }  
 public float getSavingBalance() {  
 return SavingBalance;  
 }  
  
 *//Constructor* public SavingsAccount(float balance){  
  
 SavingBalance = balance;  
  
 }  
  
 *//Calculating Monthly Interest* public void calculateMonthlyInterest(){  
  
 float MonthlyInterest = SavingBalance \* (*AnnualInterestRate*/12);  
  
 SavingBalance = SavingBalance + MonthlyInterest;  
  
 }  
  
 *//Modifying Interest Rates* public static void modifyIR (float newIR){  
  
 *AnnualInterestRate* = newIR;  
  
 }  
  
}

Task 2:

Write a JAVA program that creates a class GuessTheWord, where class attributes is a static

variable score(int).

In GuessTheWord create a static method, levelOne(with 3 string type arguments). In this

method, ask the user to input the word, and then you have to compare it with words given in

method arguments.

If user input = word 1, score will have -1; if user input = word 2, score will have +5 and if

user input = word3, score will have +1.

Now make another class GuessTheWordLevelTwo which will have another static method

levelTwo which will give bonus of 10 and print the score and also print “You are Now at LEVEL

2”

In main (GameTest Class) levelTwo will be loaded only when score value will be greater than or

equal to 10.

**CODE:**

import java.util.Scanner;  
  
public class Lab4\_Task2 {  
  
 public static void main(String[] args) {  
  
 while(GuessTheWord.*Score* < 10){  
  
 System.*out*.println("Your score is " + GuessTheWord.*Score*);  
 GuessTheWord.*LevelOne*(args);  
 }  
  
 GuessTheWordLevelTwo.*LevelTwo*();  
  
 }  
  
}  
  
  
 class GuessTheWord{  
  
 public static int *Score*;  
  
 public static void LevelOne (String [] words){  
 Scanner scn = new Scanner(System.*in*);  
 System.*out*.println("Guess The Word (Hint: Start with W) : ");  
 String input = scn.next();  
  
  
 if(words[0].equals(input)){  
 *Score* = *Score*-1;  
 } else if (words[1].equals(input)) {  
 *Score* += 5;  
 } else if (words[2].equals(input)) {  
 *Score* += 1;  
 }  
  
  
 }  
  
  
}  
  
 class GuessTheWordLevelTwo{  
 public static void LevelTwo (){  
  
 System.*out*.println("You are Now at Level 2 !!!");  
  
 GuessTheWord.*Score* += 10;  
  
 System.*out*.println("Your Score is + "+GuessTheWord.*Score*);  
  
 }  
  
}

**Task 3:**

Make an array of n elements and initialize it, data and size of the array shall be given by user.

Print all elements, print minimum number and its index in array, print maximum number and its

index.

**CODE:**

import java.util.Scanner;  
  
public class Lab4\_Task3 {  
 public static void main(String[] args) {  
  
 Scanner scn = new Scanner(System.*in*);  
  
 System.*out*.printf("Enter The Size Of Your Array:");  
 int arr\_Size = scn.nextInt();  
  
 *//Declaring an Array Here Of Array Size* int[] arr = new int[arr\_Size];  
  
 for(int i=0 ; i<arr\_Size;i++){  
  
 System.*out*.println("Enter The Numbers You want to Store at "+i+":");  
 arr [i] = scn.nextInt();  
  
 }  
  
 *//Printing All Elements* System.*out*.println("Printing Array Here:");  
 for (int i=0 ;i< arr\_Size;i++){  
 System.*out*.println(arr[i]);  
 }  
  
 *//Finding Maximum* int max = arr[0];  
 int maxindex = 0;  
 for (int i=0;i<arr\_Size;i++){  
  
 if (max < arr[i])  
 {  
 max = arr[i];  
 maxindex = i;  
 }  
  
 }  
 System.*out*.println();  
 System.*out*.println("Maximum Value is = "+max);  
 System.*out*.println("Maximum Value index is = "+maxindex);  
  
 *//Finding Minimun* int min = arr[0];  
 int minindex = 0;  
 for (int k=0;k<arr\_Size;k++){  
  
 if (min > arr[k])  
 {  
 min = arr[k];  
 minindex = k;  
 }  
  
 }  
 System.*out*.println();  
 System.*out*.println("Minimun Value is = "+min);  
 System.*out*.println("Minimun Value index is = "+minindex);  
  
  
  
 }  
  
  
  
  
}

Task 4:

Make a class Course with following attributes courseCode, courseTitle and courseCreditHr. All

attributes are private and exposed with getter and setter. In main class, create an array of courses.

Ask user to input number of courses and then for each course, get all data from user. Once user

input is done, print information of courses in the following format:

Course 1 Data:

Course Title: Object-Oriented Programming

Course Code: CSC241

Course Credit Hour: 4

**CODE:**

import java.util.Scanner;  
  
public class Lab4\_Task4 {  
 public static void main(String[] args) {  
 Scanner scn = new Scanner(System.*in*);  
  
 *//Taking Count of Student* System.*out*.printf("Enter The Number Of Courses You Studied:");  
 int input = scn.nextInt();  
 System.*out*.println();  
  
 *//Creating Array for courses* int [] courses = new int[input];  
  
 Course course = new Course();  
  
 *//Taking Input from User* for (int i=0;i<input;i++){  
  
 System.*out*.printf("\nEnter Data For %d Student: \n", i+1);  
  
 System.*out*.printf("Enter The CourseID:");  
 course.setCourseCode(scn.next());  
 System.*out*.printf("Enter The CourseTitle:");  
 course.setCourseTitle(scn.next());  
 System.*out*.printf("Enter The CourseCreditHr:");  
 course.setCourseCreditHr(scn.nextInt());  
  
 }  
  
 *//printing Data of Students* for (int i=0;i<input;i++){  
 System.*out*.println();  
 System.*out*.printf("Data of Student %d:\n",i+1);  
 System.*out*.println("Course Code = "+course.getCourseCode());  
 System.*out*.println("Course Title = "+course.getCourseTitle());  
 System.*out*.println("Course CreditHr = "+course.getCourseCreditHr());  
 }  
  
  
 }  
  
  
}  
  
*//Creating Class For Courses* class Course{  
  
 private String courseCode;  
 private String courseTitle;  
 private int courseCreditHr;  
  
 *//Making Setter Getters For Private Attributes* public void setCourseCode(String courseCode) {  
 this.courseCode = courseCode;  
 }  
 public String getCourseCode() {  
 return courseCode;  
 }  
  
 public void setCourseTitle(String courseTitle) {  
 this.courseTitle = courseTitle;  
 }  
 public String getCourseTitle() {  
 return courseTitle;  
 }  
  
 public void setCourseCreditHr(int courseCreditHr) {  
 this.courseCreditHr = courseCreditHr;  
 }  
 public int getCourseCreditHr() {  
 return courseCreditHr;  
 }  
  
 }