**SIMATS SCHOOL OF ENGINEERING**

**DEPARTMENT OF INFORMATION SECURITY**

**CSA0983 – PROGRAMMING IN JAVA WITH DEADLOCKS**

**Assignment - 3**

1. Implement a class Account. An account has

• a balance

• functions to add

• and withdraw money,

• And a function to inquire the current balance.

Condition:

1. Pass a value into a constructor to set an initial balance.

2. If no value is passed the initial balance should be set to $0.

3. Charge a $5 penalty if an attempt is made to withdraw more money than available in the account.

4. Enhance the Account class to compute interest on the current balance.

public class Account {

private double balance;

private double interestRate;

public Account(double initialBalance) {

balance = initialBalance;

interestRate = 0.05; // Default interest rate of 5%

}

public Account() {

this(0.0);

}

public void deposit(double amount) {

balance += amount;

}

public void withdraw(double amount) {

if (amount > balance) {

System.out.println("Insufficient funds. A penalty of $5 will be charged.");

balance -= 5.0; // Apply penalty of $5

} else {

balance -= amount;

}

}

public void applyInterest() {

double interest = balance \* interestRate;

balance += interest;

}

public double getBalance() {

return balance;

}

public static void main(String[] args) {

Account account1 = new Account(100.0);

System.out.println("Initial balance: $" + account1.getBalance());

account1.deposit(50.0);

System.out.println("After deposit: $" + account1.getBalance());

account1.withdraw(75.0);

System.out.println("After withdrawal: $" + account1.getBalance());

account1.applyInterest();

System.out.println("After interest applied: $" + account1.getBalance());

}

}

2. Write a class called Triangle that can be used to represent a triangle. It shouldinclude the following methods that return Boolean values indicating if the particular property holds:

• isRight (a right triangle)

• isScalene (no two sides are the same length)

• isIsosceles (exactly two sides are the same length)

• isEquilateral (all three sides are the same length)

public class Triangle {

private double side1;

private double side2;

private double side3;

public Triangle(double side1, double side2, double side3) {

this.side1 = side1;

this.side2 = side2;

this.side3 = side3;

}

public boolean isRight() {

return (side1 \* side1 + side2 \* side2 == side3 \* side3) ||

(side2 \* side2 + side3 \* side3 == side1 \* side1) ||

(side3 \* side3 + side1 \* side1 == side2 \* side2);

}

public boolean isScalene() {

return (side1 != side2) && (side2 != side3) && (side3 != side1);

}

public boolean isIsosceles() {

return (side1 == side2 && side2 != side3) ||

(side2 == side3 && side3 != side1) ||

(side3 == side1 && side1 != side2);

}

public boolean isEquilateral() {

// Check if all three sides are the same length

return (side1 == side2) && (side2 == side3);

}

public static void main(String[] args) {

Triangle triangle = new Triangle(3, 4, 5);

System.out.println("Is it a right triangle? " + triangle.isRight());

System.out.println("Is it a scalene triangle? " + triangle.isScalene());

System.out.println("Is it an isosceles triangle? " + triangle.isIsosceles());

System.out.println("Is it an equilateral triangle? " + triangle.isEquilateral());

}

}