King Abdulaziz University
Faculty of Engineering
Electrical and Computer Engineering
EE-202-Object-Oriented Computer Programming
Lab-5

Q-1 For each of the given program segments, read the code and write the output in the space provided below each program. [Note: Do not execute these programs on a computer.] Use the following class definition to answer the questions:

```
1  public class Account
2  {
3     private double balance; // instance variable that stores the balance
4
5     // constructor
6     public Account( double initialBalance )
7     {
8        // validate that initialBalance is greater than 0.0;
9        // if it is not, balance is initialized to the default value 0.0
10       if ( initialBalance > 0.0 )
11          balance = initialBalance;
12    } // end Account constructor
13
14    // credit (add) an amount to the account
15    public void credit( double amount )
16    {
17       balance = balance + amount; // add amount to balance
18    } // end method credit
19
20    // return the account balance
21    public double getBalance()
22    {
23       return balance; // gives the value of balance to the calling method
24    } // end method getBalance
25 } // end class Account
```

- What is output by the following main methods?

```
1  public static void main( String args[] )
2  {
3     Account account1 = new Account( 35.50 );
4
5     System.out.printf( "account1 balance: $%.2f\n", account1.getBalance() );
6  } // end main
```

Answer:

account1 balance: $35.50

```java
public static void main( String args[] )
{
   Account account1 = new Account( -20.17 );

   System.out.printf( "account1 balance: $%.2f\n", account1.getBalance() );
} // end main
```

Answer:

account1 balance: $0.00

```java
public static void main( String args[] )
{
   Account account1 = new Account( 15.33 );

   System.out.printf( "account1 balance: $%.2f\n", account1.getBalance() );
   System.out.println( "adding $2.53 to account1 balance" );

   account1.credit( 2.53 );
   System.out.printf( "account1 balance: $%.2f\n", account1.getBalance() );
} // end main
```

Answer:

account1 balance: $15.33
adding $2.53 to account1 balance
account1 balance: $17.86

```java
public static void main( String args[] )
{
   Account account1 = new Account( 7.99 );

   System.out.printf( "account1 balance: $%.2f\n", account1.getBalance() );
   System.out.println( "adding -$1.14 to account1 balance" );

   account1.credit( -1.14 );
   System.out.printf( "account1 balance: $%.2f\n", account1.getBalance() );
} // end main
```

Answer:

account1 balance: $7.99
adding -$1.14 to account1 balance
account1 balance: $6.85

Q-2 Create a class called Employee that includes three pieces of information as instance variables—a first name (type String), a last name (type String) and a monthly salary (type double). Your class should have a constructor that initializes the three instance variables. Provide a *set* and a *get* method for each instance variable. If the monthly salary is not positive, set it to 0.0. Write a test application named EmployeeTest that demonstrates class Employee's capabilities. Create two Employee objects and display the yearly salary for each Employee. Then give each Employee a 10% raise and display each Employee's yearly salary again.

Sample Output

```
Employee 1: Bob Jones; Yearly Salary: 34500.00
Employee 2: Susan Baker; Yearly Salary: 37809.00

Increasing employee salaries by 10%
Employee 1: Bob Jones; Yearly Salary: 37950.00
Employee 2: Susan Baker; Yearly Salary: 41589.90
```

Program Template

```
/* Begin class declaration of Employee class. */

   /* Declare three instance variables here. */

   /* Add a constructor that declares a parameter for each instance variable. Assign
      each parameter value to the appropriate instance variable. Write code that
      validates the value of salary to ensure that it is not negative. */

   /* Declare set and get methods for the first name instance variable. */

   /* Declare set and get methods for the last name instance variable. */

   /* Declare set and get methods for the monthly salary instance variable. Write code
      that validates the salary to ensure that it is not negative. */

/* End class declaration of Employee class. */
```

Figure 1:Employee.java

```
/* Begin class declaration of EmployeeTest class. */

   /* Begin main method declaration. */

   / * Create two Employee objects and assign them to Employee variables. */

   /* Output the first name, last name and salary for each Employee. */

   /* Give each Employee a 10% raise. */

   /* Output the first name, last name and salary of each Employee again. */

   /* End main method declaration */

/* End class declaration of EmployeeTest class. */
```

Figure 2:EmployeeTest.java.

Answer:

Class 1:

```java
public class Employee {

    private String firstName;
    private String lastName;
    private double monthlySalary;

    public Employee(String firstName, String lastName, double monthlySalary) {
        this.firstName = firstName;
        this.lastName = lastName;
        if (monthlySalary > 0.0 )
        this.monthlySalary = monthlySalary;
    }

    public String getFirstName() {
        return firstName;
    }

    public void setFirstName(String firstName) {
        this.firstName = firstName;
    }

    public String getLastName() {
        return lastName;
    }

    public void setLastName(String lastName) {
        this.lastName = lastName;
    }

    public double getMonthlySalary() {
        return monthlySalary;
    }

    public void setMonthlySalary(double monthlySalary) {
        this.monthlySalary = monthlySalary;
    }
}
```

Class 2:

Employee.java | EmployeeTest.java

```
1  package lab5;
2
3  public class EmployeeTest {
4
5      public static void main(String[] args) {
6
7          Employee Employee1 = new Employee("Bob", "Jones", 2875.00);
8          Employee Employee2 = new Employee("Susan", "Baker", 3150.75);
9
10         System.out.printf("Employee 1: %s %s; Yearly salary: %.2f%n",
11                 Employee1.getFirstName(),Employee1.getLastName(),Employee1.getMonthlySalary()*12);
12         System.out.printf("Employee 2: %s %s; Yearly salary: %.2f%n",
13                 Employee2.getFirstName(),Employee2.getLastName(),Employee2.getMonthlySalary()*12);
14
15         Employee1.setMonthlySalary(Employee1.getMonthlySalary()*1.10);
16         Employee2.setMonthlySalary(Employee2.getMonthlySalary()*1.10);
17
18         System.out.printf("%nIncreasing employee salaries by 10%% %n");
19         System.out.printf("Employee 1: %s %s; Yearly salary: %.2f%n",
20                 Employee1.getFirstName(),Employee1.getLastName(),Employee1.getMonthlySalary()*12);
21         System.out.printf("Employee 2: %s %s; Yearly salary: %.2f%n",
22                 Employee2.getFirstName(),Employee2.getLastName(),Employee2.getMonthlySalary()*12);
23     }
24 }
```

Problems | Debug Shell | Console | Terminal

```
<terminated> EmployeeTest [Java Application] C:\Users\Hayan\.p2\pool\plugins\org.eclipse.justj.openjdk.hotspo
Employee 1: Bob Jones; Yearly salary: 34500.00
Employee 2: Susan Baker; Yearly salary: 37809.00

Increasing employee salaries by 10%
Employee 1: Bob Jones; Yearly salary: 37950.00
Employee 2: Susan Baker; Yearly salary: 41589.90
```