We have already discussed a about encapsulation while discussing OOPs concepts.

The whole idea behind encapsulation is to hide the implementation details from users. If a data member is private it means it can only be accessed within the same class. No outside class can access private data member (variable) of other class. However if we setup public getter and setter methods to update (for e.g. void setSSN(int ssn))and read (for e.g. int getSSN()) the private data fields then the outside class can access those private data fields via public methods. This way data can only be accessed by public methods, thus making the private fields and their implementation hidden for outside classes. That’s why encapsulation is known as data hiding.

public class EncapsulationDemo{

private String empName;

//Getter and Setter methods

public String getEmpName(){

return empName;

}

public void setEmpName(String newValue){

empName = newValue;

}

}

public class EncapsTest{

public static void main(String args[]){

EncapsulationDemo obj = new EncapsulationDemo();

obj.setEmpName("Mario");

System.out.println("Employee Name: " + obj.getEmpName());

}

}

**Answers**

Exercise 3-1: Develop a code for the following scenario.

“An encapsulated class contains three variables to store Name, Age and Salary of the employee. Evelop getters and setters to set and get values . Develop a test class to test your code.”

public class Employee{

private String empName;

private int age;

private double salary;

//Getter and Setter methods for Name

public String getEmpName(){

return empName;

}

public void setEmpName(String en){

empName = en;

}

//Getter and Setter methods for Age

public int getAge (){

return age;

}

public void setAge (String a){

age= a;

}

//Getter and Setter methods for Salary

public double getSalary (){

return salary;

}

public void setSalary (String sl){

salary = sl;

}

}

public class EncapsTest{

public static void main(String args[]){

Employee e = new Employee();

//set values using the setter method

e.setEmpName("John");

e.setAge("23");

e.setSalary("5000000.00");

//display values using the getter method

System.out.println("Employee Name: " +e.getEmpName());

System.out.println("Employee Age: " +e.getEmpAge());

System.out.println("Employee Salary: " +e.getSalary());

}

}

Now modify the same code by trying to replace the setters using a constructor.

public class Employee{

private String empName;

private int age;

private double salary;

//Constructor

public Employee(String en,int a,double sl){

empName = en;

age = a;

salary = s;

}

//Getter method for Name

public String getEmpName(){

return empName;

}

//Getter method for Age

public int getAge(){

return age;

}

//Getter method for Salary

public double getSalary(){

return salary;

}

}

public class EncapsTest{

public static void main(String args[]){

//set values using the setter method

Employee e = new Employee("John",23,500000.00);

//display values using the getter method

System.out.println("Employee Name: " +e.getEmpName());

System.out.println("Employee Age: " +e.getEmpAge());

System.out.println("Employee Salary: " +e.getSalary());

}

}

Exercise 3-2: Code for the last example that we have discussed during the class. We need the following Output. (Use Netbeans code generation option where necessary)

Employee Name: xxxxx (Use setter to set and getter to retrieve)

Basic Salary: xxxx (Use setter to set and getter to retrieve)

Bonus: xxxx (You may use the constructor to pass this value)

Bonus Amount: xxxxx (Develop a separate method to calculate Bonus amount. Bonus amount is the total of Bonus and Basic Salary)

E.g.

Employee Name: Bogdan

Basic Salary: 50000

Bonus: 10000

Bonus Amount: 60000

public class Employee{

private String empName;

private double basicSalary;

private double bonus;

//Constructor

public Employee(String en,double bSalary,double b){

empName = en;

basicSalary = bSalary;

bonus = b;

}

//Getter and Setter methods for Name

public String getEmpName(){

return empName;

}

public void setEmpName(String en){

empName = en;

}

//Getter and Setter methods for basic salary

public double getBasicSalary(){

return basicSalary;

}

public void setBasicSalary(String bSalary){

basicSalary = bSalary;

}

//Getter method for bonus

public double getBonus(){

return bonus;

}

//Method for get bonus amount

public double getBonusAmount(){

return basicSalary + bonus;

}

}

public class EncapsTest{

public static void main(String args[]){

Employee e = new Employee("Bogdan",50000,10000);

//display values using the getter and setter methods

System.out.println("Employee Name: " +e.getEmpName());

System.out.println("Employee Basic Salary: " +e.getbasicSalary());

System.out.println("Employee Bonus: " +e.getBonus());

System.out.println("Employee Bonus Amount: " +e.getBonusAmount());

}

}