COMP 20043

OOPM

LAB EXERCISE WEEK 3

```
class Person {
   String name; int age;
   void setName(String n) {
      name = n;
   }
String getName(){
return name;}

void setAge(int a){
age = a;
}
int getAge(){
return age;}
}

class Main {
   public static void main(String[] args) {
      Person P = new Person();
      P.setName( "Ahmed");
      P.setAge ( 25);
      System.out.println("Person Name" + P.getName());
     System.out.println("Person Age" + P.getAge());
   }}
```

This program features a class called Person with two instance variables, name and age, and set and get methods to set the values to the variables and return their values respectively.
In the Main class, we create an object of the Person class named P, set the values of its properties using **set** methods, and call its **get** methods to print the properties to the console.

Tasks

1. Define a class called BankAccount with two data members: balance and Account Number .This class should also have the following. a) constructor to initialize the variables with values passed from main method using parameters. b) set()and get() methods for setting value and returning value for the class variables. c) method deposit() to add an amount to the balance. d) a method withdraw() to deduct an amount from the balance. Define another class that hosts the main method. Inside the main method: Create an instance/object of the BankAccount class. Call all the methods using the instance/object created to display their functionality.

2. Define a class called Employee with four data members: name, id, position, and salary, and two member functions: void input() to assign input values using parameters passed from the main method and void display() to display the values. Appropriate data types are to be chosen for the data members. Define another class that hosts the main method. Inside the main method: Create an instance/object of the Employee class. Call the input(), display() methods using the instance/object created.

3. Define a class called Product with three data members: productId, name, and price. Appropriate data types are to be chosen. The class should also have the necessary **set** and **get** member functions to set the values for the data members and to return the values of the data members respectively. Define another class that hosts the main method. Inside the main method: Create two instances/objects of the Product class. Call the **set** and **get** methods using the instance/objects created to display their functionality.

4. Create a class called Vehicle with variables brand and model, as well as methods to set and get the values of these variables. Then, create a subclass called Car that adds an additional variable numDoors and methods to set and get its value. Define another class that hosts the main method. Inside the main method: Create two instances/objects of the Car class. Call the **set** and **get** methods using the instance/objects created to display their functionality.

5. Create a class called Animal with instance variables name and age, as well as methods to set and get the values of these variables. Then, create a subclass called Dog that adds additional instance variables breed and sound and methods to set and get their values. Define another class that hosts the main method. Inside the main method: Create a instance/object of the Dog class. Call the **set** and **get** methods using the instance/object created to display their functionality.

6. Write the code for each class and include the necessary methods as described below: Animal class: Method: void eat() - prints "Animal is eating." ,Method: void sleep() - prints "Animal is sleeping."

Mammal class (inherits from Animal): Method: void giveBirth() - prints "Mammal is giving birth."
Bird class (inherits from Animal): Method: void fly() - prints "Bird is flying."
Reptile class (inherits from Animal): Method: void crawl() - prints "Reptile is crawling."
Dog class (inherits from Mammal): Method: void bark() - prints "Dog is barking."
Eagle class (inherits from Bird): Method: void hunt() - prints "Eagle is hunting."
Snake class (inherits from Reptile): Method: void poison() - prints "Snake is poisonous."
Additionally, create a main method in a class named InheritanceHierarchy to demonstrate the behavior of the different animal types.