

Lab 05 – Classes and Objects

Task 01:

Write a class named **Car** that has the following data members:

- *yearModel* – an int field that hold the car's year model.
- *make* – a String field that holds the make of the car.
- *speed* – an int field that holds the car's current speed.

The class also should have the following constructor and other methods:

- constructor – that accepts the car's year model and make as arguments. These values should be assigned to the object's *yearModel* and *make* fields. The constructor also should assign 0 to the *speed* field.
- Accessors. Appropriate accessor methods should get the values stored in an object's *yearModel*, *make* and *speed* fields.
- *accelerate*. The accelerate method should add 5 to the speed field each time it is called.
- *brake*. The brake method should subtract 5 from the speed field each time it is called.

Demonstrate the class in a program that creates a **Car** object, and then calls the *accelerate* method five times. After each call to the *accelerate* method, get the current speed of the car and display it. Then call the *brake* method five times. After each call to the *brake* method, get the current speed of the car and display it.

Code:

```
package Task01;

public class Car {
    private int yearModel;
    private String make;
    private int speed;

    // constructor
    public Car(int yearModel, String make) {
        this.yearModel = yearModel;
        this.make = make;
        this.speed = 0;
    }

    // getters
    public int getYearModel() {
        return yearModel;
    }
    public String getMake() {
        return make;
    }
    public int getSpeed() {
        return speed;
    }

    // methods to accelerate & brake
    public void accelerate() {
```

```
        speed += 5;
    }
    public void brake() {
        speed -= 5;
    }

    public static void main(String[] args) {
        Car c = new Car(2022, "Honda");

        // accelerating and displaying speed five times
        for(int i = 0; i < 5; i++) {
            c.accelerate();
            System.out.println(c.getSpeed());
        }

        System.out.println();

        // braking 4 times and displaying speed
        for(int i = 0; i < 4; i++) {
            c.brake();
            System.out.println(c.getSpeed());
        }
    }
}
```

Output:

```
"C:\Program Files\Java\jdk-24\bin\java.exe" "-javaagent:C:\Program Files\Jet
5
10
15
20
25

20
15
10
5

Process finished with exit code 0
|
```

Task 02:

Write a Java class Book with following features:

- Instance variables:
 - **title** for the title of book of type String.
 - **author** for the author's name of type String.
 - **price** for the book price of type double.
- Constructor:
 - **public Book (String title, String name, double price):**
- Instance methods:
 - **public void setTitle(String title):** Used to set the title of book.
 - **public void setAuthor(String author):** Used to set the name of author.
 - **public void setPrice(double price):** Used to set the price of book.
 - **public double getTitle():** This method returns the title of book.
 - **public double getAuthor():** This method returns the author's name of book.
 - **public String printInfo():** This method printed out book's details to the screen

Write a separate class **BookDemo** with a main() method creates a Book titled “Developing Java Software” with authors Russel Winderand price 79.75. Prints the Book's string representation to standard output (using System.out.println).

Code:

```
-class Book
package Task02;

public class Book {
    private String title;
    private String author;
    private double price;

    // constructor
    public Book(String title, String author, double price){
        this.title = title;
        this.author = author;
        this.price = price;
    }

    // setters
    public void setTitle(String title) {
        this.title = title;
    }
    public void setAuthor(String author) {
        this.author = author;
    }
}
```

```
public void setPrice(double price) {
    this.price = price;
}

// getters
public String getTitle(){
    return this.title;
}
public String getAuthor(){
    return this.author;
}
public double getPrice(){
    return this.price;
}

// method to print info
public void printInfo(){
    System.out.println("Title: " + title);
    System.out.println("Author: " + author);
    System.out.println("Price: " + price);
}
}

-class BookDemo
package Task02;

public class BookDemo {
    public static void main(String[] args) {
        Book b = new Book("Developing Java", "Muhammad Hasan", 79.5);

        b.printInfo();
    }
}
```

Output:

```
"C:\Program Files\Java\jdk-24\bin\java.exe" "-javaagent:C:\Program Files\Jet
Title: Developing Java
Author: Muhammad Hasan
Price: 79.5

Process finished with exit code 0
```