Lab 5

Classes And Objects

https://github.com/mmujtaba25/cs-212

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Activity 1 output

```java
class Student {
    int id;
    String n;

    public Student(int id, String n) {
        this.id = id;
        this.n = n;
    }
}

public class Main {
    public static void main(String[] args) {
        Student s1 = new Student(10, "Alice");
        System.out.println(s1.id);
        System.out.println(s1.n);
    }
}
```

OUTPUT:

```
10
Alice
```

Activity 2 output

```java
class Book {
    String title;
    double price;

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

public class Main {
    public static void main(String[] args) {
        Book b1 = new Book("Java Basics", 29.99);
        System.out.println(b1.title);
        System.out.println(b1.price);
    }
}
```

OUTPUT:

```
Java Basics
29.99
```

Activity 3 output

```java
class Teacher {
    int teacherId;
    String subject;

    public Teacher(int teacherId, String subject) {
        this.teacherId = teacherId;
        this.subject = subject;
    }
}

public class Main {
    public static void main(String[] args) {
        Teacher t1 = new Teacher(501, "Mathematics");
        System.out.println(t1.teacherId);
        System.out.println(t1.subject);
    }
}
```

OUTPUT:

```
501
Mathematics
```

Lab 5 - Task 1

```java
package Lab5.Tasks;

public class Task1
{
    public static void main(String[] args)
    {
        Student ali = new Student("Ali", 20, 70);
        Student hamza = new Student("Hamza", 25, 60);
        Student sheharyar = new Student("Sheharyar", 18, 80);

        System.out.println("-----------------------");
        ali.printDetails();
        System.out.println("-----------------------");
        hamza.printDetails();
        System.out.println("-----------------------");
        sheharyar.printDetails();
        System.out.println("-----------------------");
    }

    private static class Student
    {
        private final String name;
        private final int age;
        private final int marks;

        public Student(String name, int age, int marks)
        {
            this.name = name;
            this.age = age;
            this.marks = marks;
        }

        public void printDetails()
        {
            System.out.println("Name : " + name);
            System.out.println("Age  : " + age);
            System.out.println("Marks: " + marks);
        }
    }
}
```

Program Output

```
-----------------------
Name : Ali
Age  : 20
Marks: 70
-----------------------
Name : Hamza
Age  : 25
Marks: 60
-----------------------
```

```
Name : Sheharyar
Age  : 18
Marks: 80
-----------------------
```

Lab 5 - Task 2

```java
package Lab5.Tasks;

public class Task2
{
    public static void main(String[] args)
    {
        Rectangle rectangle = new Rectangle(10, 20);

        System.out.println("Rectangle Length: " + rectangle.getLength());
        System.out.println("Rectangle Width : " + rectangle.getWidth());
        System.out.println("Rectangle Area  : " + rectangle.getArea());
    }

    private static class Rectangle
    {
        private final int length;
        private final int width;

        public Rectangle(int length, int width)
        {
            this.length = length;
            this.width = width;
        }

        public int getArea()
        {
            return this.length * this.width;
        }

        /* GETTERS */

        public int getWidth()
        {
            return width;
        }

        public int getLength()
        {
            return length;
        }
    }
}
```

Program Output

```
Rectangle Length: 10
Rectangle Width : 20
Rectangle Area  : 200
```

Lab 5 - Task 3

```java
package Lab5.Tasks;

public class Task3
{
    public static void main(String[] args)
    {
        BankAccount aliBankAccount = new BankAccount("Ali", 500);

        aliBankAccount.deposit(1000);
        aliBankAccount.withdraw(600);

        System.out.println("Final Balance: " + aliBankAccount.getBalance());
    }

    private static class BankAccount
    {
        private final String holderName;
        private int balance = 0;

        public BankAccount(String holderName, int balance)
        {
            this.holderName = holderName;
            this.balance = balance;
        }

        public BankAccount(String holderName)
        {
            this.holderName = holderName;
        }

        /* METHODS */

        public void deposit(int amount)
        {
            if (amount > 0) balance += amount;
        }

        public void withdraw(int amount)
        {
            if (balance > amount) balance -= amount;
        }

        /* GETTERS */

        public int getBalance()
        {
            return balance;
        }
    }
}
```

Program Output

```
Final Balance: 900
```

Lab 5 - Task 4

```java
package Lab5.Tasks;

public class Task4
{
    public static void main(String[] args)
    {
        Car toyotaCorolla = new Car("Toyota", "Corolla", 2020);
        Car toyotaCivic = new Car("Toyota", "Civic", 2018);

        System.out.println("------------------------");
        toyotaCorolla.displayInfo();
        System.out.println("------------------------");
        toyotaCivic.displayInfo();
        System.out.println("------------------------");
    }

    private static class Car
    {
        private final String brand;
        private final String model;
        private final int year;

        public Car(String brand, String model, int year)
        {
            this.brand = brand;
            this.model = model;
            this.year = year;
        }

        public void displayInfo()
        {
            System.out.println("Brand: " + brand);
            System.out.println("Model: " + model);
            System.out.println("Year : " + year);
        }
    }
}
```

Program Output

```
------------------------
Brand: Toyota
Model: Corolla
Year : 2020
------------------------
Brand: Toyota
Model: Civic
Year : 2018
------------------------
```

Lab 5 - Task 5

```java
package Lab5.Tasks;

public class Task5
{
    public static void main(String[] args)
    {
        Employee ahmad = new Employee("Ahmad", 10_000);
        System.out.println("Ahmad Yearly Salary is: " + ahmad.getYearlySalary());
    }

    private static class Employee
    {
        private final String name;
        private final int monthlySalary;

        public Employee(String name, int monthlySalary)
        {
            this.name = name;
            this.monthlySalary = monthlySalary;
        }

        public int getYearlySalary()
        {
            return monthlySalary * 12;
        }
    }
}
```

Program Output

```
Ahmad Yearly Salary is: 120000
```