Lab 6

Fundamentals of OOP (Constructors, Getters and Setters)

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

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Lab 6 - Task 1

```java
package Lab6.Tasks;

public class Task1
{
    public static void main(String[] args)
    {
        Rectangle firstRectangle = new Rectangle(4, 40);
        Rectangle secondRectangle = new Rectangle(3.5, 35.9);

        System.out.println("First Rectangle:");
        firstRectangle.printInfo();
        System.out.println(); // blank line
        System.out.println("Second Rectangle:");
        secondRectangle.printInfo();
    }

    private static class Rectangle
    {
        private final double width;
        private final double height;

        public Rectangle()
        {
            this.width = 1;
            this.height = 1;
        }

        public Rectangle(double width, double height)
        {
            this.width = width;
            this.height = height;
        }

        public double getArea()
        {
            return width * height;
        }

        public double getPerimeter()
        {
            return 2 * (width + height);
        }

        public void printInfo()
        {
            System.out.println("Width: " + width);
            System.out.println("Height: " + height);
            System.out.println("Area: " + getArea());
            System.out.println("Perimeter: " + getPerimeter());
        }
    }
}
```

Program Output

```
First Rectangle:
Width: 4.0
Height: 40.0
Area: 160.0
Perimeter: 88.0

Second Rectangle:
Width: 3.5
Height: 35.9
Area: 125.64999999999999
Perimeter: 78.8
```

Lab 6 - Task 2

```java
package Lab6.Tasks;

public class Task2
{
    public static void main(String[] args)
    {
        Employee firstEmployee = new Employee("Muhammad", "Ali", 3000);
        Employee secondEmployee = new Employee("Muhammad", "Ahmad", 3500);

        firstEmployee.printInfo();
        System.out.println(); // blank line
        secondEmployee.printInfo();

        // Give each employee a 10% raise
        firstEmployee.setMonthlySalary(firstEmployee.getMonthlySalary() * 1.10);
        secondEmployee.setMonthlySalary(secondEmployee.getMonthlySalary() * 1.10);

        System.out.println(); // blank line
        System.out.println("After 10% raise:");
        firstEmployee.printInfo();
        System.out.println(); // blank line
        secondEmployee.printInfo();
    }

    private static 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;
            this.monthlySalary = Math.max(0, monthlySalary);
        }

        public void printInfo()
        {
            System.out.printf("%s %s:\n", firstName, lastName);
            System.out.printf("Monthly Salary: %.2f\n", monthlySalary);
        }

        /* GETTERS & SETTERS */

        public String getFirstName()
        {
            return firstName;
        }

        public String getLastName()
        {
```

```
            return lastName;
        }

        public double getMonthlySalary()
        {
            return monthlySalary;
        }

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

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

        public void setMonthlySalary(double monthlySalary)
        {
            this.monthlySalary = Math.max(0, monthlySalary);
        }
    }
}
```

Program Output

```
Muhammad Ali:
Monthly Salary: 3000.00

Muhammad Ahmad:
Monthly Salary: 3500.00

After 10% raise:
Muhammad Ali:
Monthly Salary: 3300.00

Muhammad Ahmad:
Monthly Salary: 3850.00
```