كلية علوم و هندسة الحاسب
College of Computer Science and Engineering

قسم هندسة البرمجيات
Dep. of Software Engineering

جامعة جدة
University of Jeddah

CCSW 413 Lab 7:

JAVA FLYWEIGHT AND PROXY DESIGN PATTERNS

PREPARED BY

RETAL HISHAM SHILLI
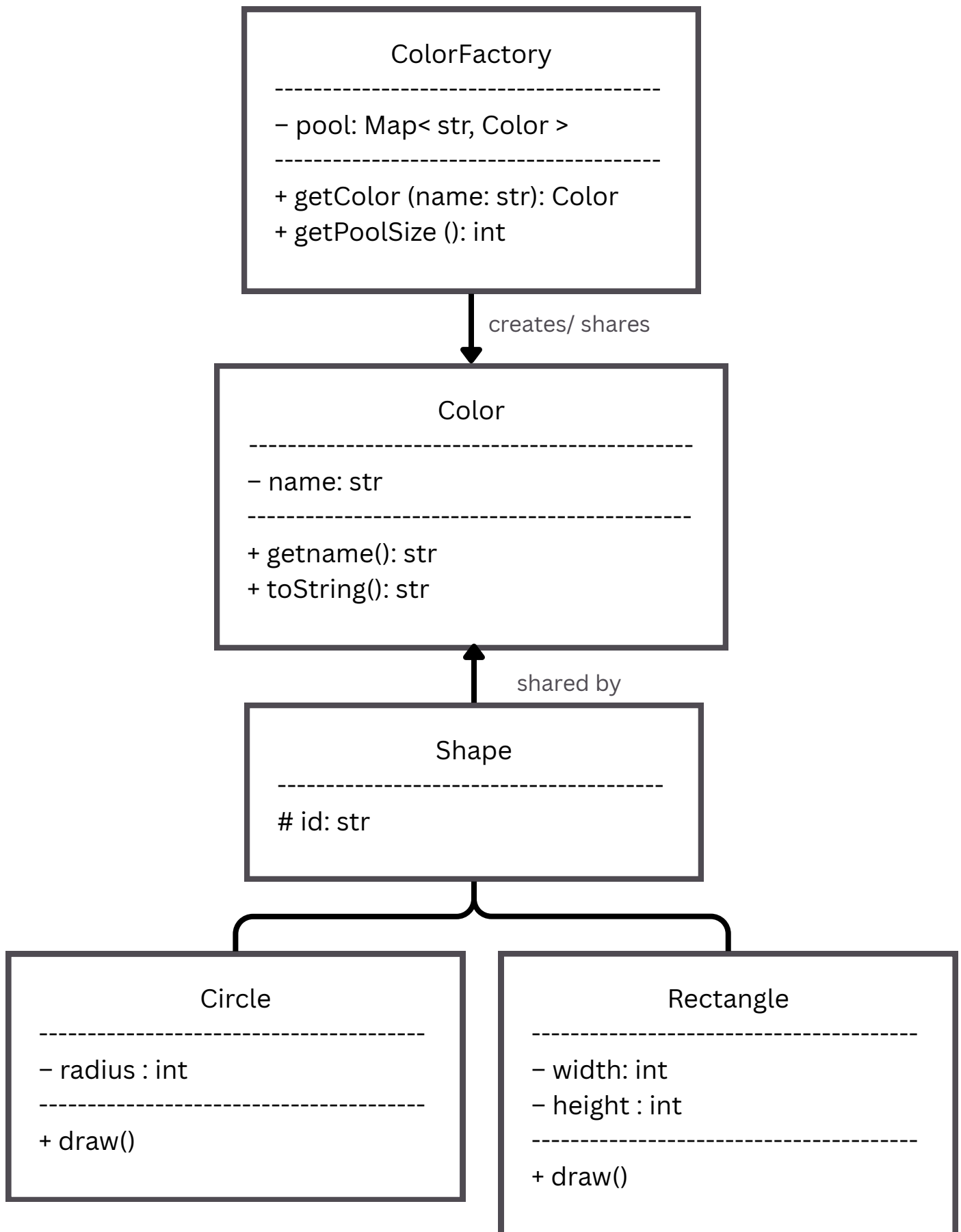
STUDENT ID

2211432

Github Link: lab7

Main:

```java
package lab7;

public class Main {
    Run | Debug | Run main | Debug main
    public static void main(String[] args) {

        System.out.println(x:" === in lab task 1: === ");
        TextEditor editor = new TextEditor();
        editor.addCharacter(symbol:'A', position:1, fontSize:12, color:"black");
        editor.addCharacter(symbol:'B', position:2, fontSize:14, color:"red");
        editor.addCharacter(symbol:'A', position:3, fontSize:18, color:"blue");
        editor.addCharacter(symbol:'C', position:4, fontSize:12, color:"black");
        editor.addCharacter(symbol:'B', position:5, fontSize:14, color:"red");

        System.out.println("Flyweight objects created: " + editor.getFlyweightCount());


        System.out.println(x:" === assignment 1: === ");
        ColorFactory colorFactory = new ColorFactory();

        Shape circle1 = new Circle(id:"C1", radius:10, colorFactory.getColor(name:"Red"));
        Shape circle2 = new Circle(id:"C2", radius:15, colorFactory.getColor(name:"Red"));
        Shape rectangle1 = new Rectangle(id:"R1", width:8, height:12, colorFactory.getColor(name:"Blue"));
        Shape rectangle2 = new Rectangle(id:"R2", width:10, height:20, colorFactory.getColor(name:"Blue"));
        Shape rectangle3 = new Rectangle(id:"R3", width:5, height:10, colorFactory.getColor(name:"Green"));

        circle1.draw();
        circle2.draw();
        rectangle1.draw();
        rectangle2.draw();
        rectangle3.draw();
        System.out.println("\nUnique Color objects created: " + colorFactory.getPoolSize());


        System.out.println(x:" === assignment 2: === ");
        Image img1 = new ProxyImage(url:"https://example.com/pic1.jpg");
        Image img2 = new ProxyImage(url:"https://example.com/pic2.jpg");

        System.out.println(x:" Image thumbnails loaded ");
        // placeholders only
        ImageLoader loader = new ImageLoader();
        loader.showThumbnail(url:"https://example.com/pic1.jpg");
        loader.showThumbnail(url:"https://example.com/pic2.jpg");

        System.out.println(x:"\n Now viewing full image 1 ");
        img1.display(); // triggers actual download

        System.out.println(x:"\n Viewing image 1 again ");
        img1.display(); // already loaded, skips download

        System.out.println(x:"\n Now viewing full image 2 ");
        img2.display(); // triggers download
    }
}
```

output:

```
PROBLEMS 21    OUTPUT    DEBUG CONSOLE    TERMINAL    PORTS
● PS C:\Users\retal\OneDrive\Desktop\SW_Patterns>  c:; cd 'c:\Users\retal\OneDrive\Desktop\SW_Patterns'; & 'C:\Program Files\Java\jdk-19\bin\java.exe' '-XX:+ShowCod
  eDetailsInExceptionMessages' '-cp' 'C:\Users\retal\OneDrive\Desktop\SW_Patterns\SW_patterns_lab7\lab7\target\classes' 'lab7.Main'
   === in lab task 1: ===
  Drawing character 'A' at pos 1 with fontSize=12 and color=black
  Drawing character 'B' at pos 2 with fontSize=14 and color=red
  Drawing character 'A' at pos 3 with fontSize=18 and color=blue
  Drawing character 'C' at pos 4 with fontSize=12 and color=black
  Drawing character 'B' at pos 5 with fontSize=14 and color=red
  Flyweight objects created: 3
   === assignment 1: ===
  Drawing Circle[id=C1, radius=10, color=red]
  Drawing Circle[id=C2, radius=15, color=red]
  Drawing Rectangle[id=R1, 8x12, color=blue]
  Drawing Rectangle[id=R2, 10x20, color=blue]
  Drawing Rectangle[id=R3, 5x10, color=green]

  Unique Color objects created: 3
   === assignment 2: ===
   Image thumbnails loaded
  Showing placeholder thumbnail for: https://example.com/pic1.jpg
  Showing placeholder thumbnail for: https://example.com/pic2.jpg

   Now viewing full image 1
  Creating RealImage object...
  Downloading image from: https://example.com/pic1.jpg
  Displaying image: https://example.com/pic1.jpg


   Viewing image 1 again
  Displaying image: https://example.com/pic1.jpg

   Now viewing full image 2
  Creating RealImage object...
  Downloading image from: https://example.com/pic2.jpg
  Displaying image: https://example.com/pic2.jpg
○ PS C:\Users\retal\OneDrive\Desktop\SW_Patterns> []
```

UML Class Diagrams: assignment 1

ColorFactory

– pool: Map< str, Color >

+ getColor (name: str): Color
+ getPoolSize (): int

creates/ shares

Color

– name: str

+ getname(): str
+ toString(): str

shared by

Shape

---

id: str

Circle

– radius : int

+ draw()

Rectangle

– width: int
– height : int

+ draw()

```
                        <<interface>>
                           Image
-----------------------------------------------------------
+ display () : void
```

```
                ConcreteImage
-------------------------------------------
 – url : str
-------------------------------------------
+ realImage (url: str)
+ display (): void
```

```
                   ProxyImage
-------------------------------------------
– url : str
–  realImage : ConcreteImage
-------------------------------------------
+ proxyImage (url: str)
+ display () : void
```