CS5004 Lab01 Report

Rong Huang

Lab 01: First Class

1. Reflection(*What did you learn?*)

1) Learning about Constructors and Overloading:
This project deepened my understanding of constructors and the concept of overloading in Java. By creating multiple constructors for the Color and Pixel classes, I learned how to provide flexibility in object creation. The use of this keyword to call one constructor from another was a practical demonstration of constructor chaining, reducing code redundancy.

2) Incorporate data validation within the setters:
I learned to incorporate data validation within the setters. The checkValue method ensured that RGB values stayed within the valid range, preventing invalid states. This practice emphasized the importance of maintaining the integrity of an object's state.

3) Working from a Test File
Starting the project with a given JUnit test file was a new and enlightening experience for me. It introduced me to the concept of test-driven development. Writing code to pass predefined tests helped me focus on meeting the exact requirements and specifications. It was interesting to see how tests can guide the development process and ensure the functionality of the code from the outset.

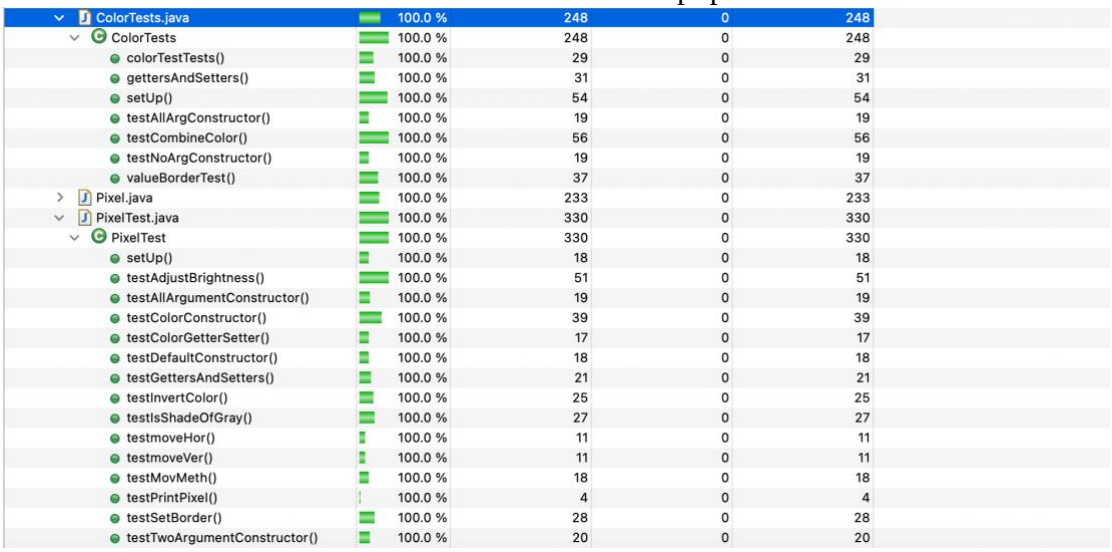
4) Code Reusability and Efficiency
Throughout the project, I was constantly thinking about ways to reduce code duplication. This was particularly evident in methods like combineColor in the Color class and the various constructors in both Color and Pixel classes. Learning to write reusable code not only made my code more efficient but also easier to maintain and modify.

2. Extensions (What extensions are you requesting?)

1) Add additional functionality to the Pixel and more color manipulation
I create the isShadeOfGray() method to check if the pixel's color is a shade of gray, invertColor() to inverts the color of the pixel,adjustBrightness to adjusts the brightness of the pixel's color and test the three extra methods.

2) Make improvements to the existing testing file

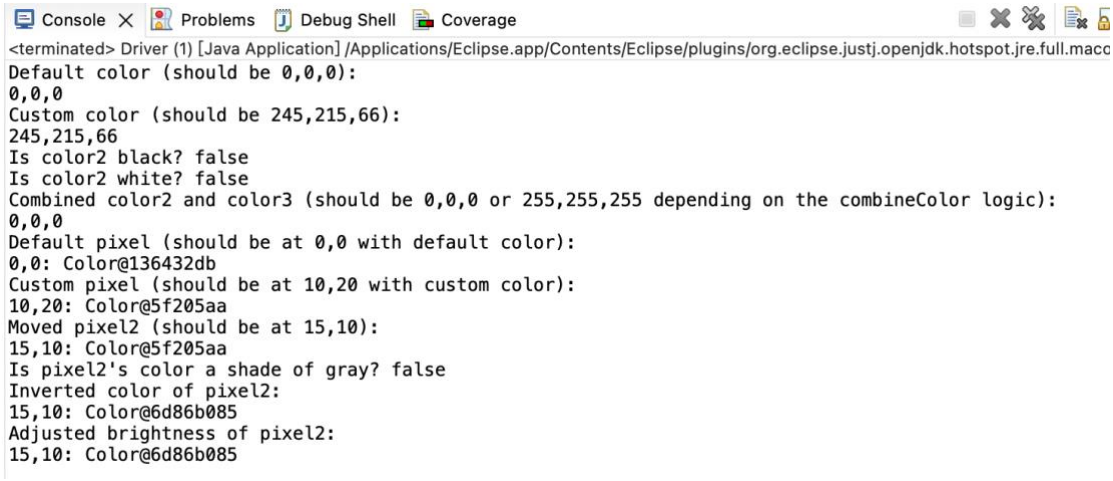
I made improvements to the existing ColorTest.java, adding testCombineColor and check both the situation that the combine color excced 255 and not exceed. Now the ColorTest test all the methods of the color class except print color.



ColorTests.java	100.0 %	248	0	248
ColorTests	100.0 %	248	0	248
colorTestTests()	100.0 %	29	0	29
gettersAndSetters()	100.0 %	31	0	31
setUp()	100.0 %	54	0	54
testAllArgConstructor()	100.0 %	19	0	19
testCombineColor()	100.0 %	56	0	56
testNoArgConstructor()	100.0 %	19	0	19
valueBorderTest()	100.0 %	37	0	37
Pixel.java	100.0 %	233	0	233
PixelTest.java	100.0 %	330	0	330
PixelTest	100.0 %	330	0	330
setUp()	100.0 %	18	0	18
testAdjustBrightness()	100.0 %	51	0	51
testAllArgumentConstructor()	100.0 %	19	0	19
testColorConstructor()	100.0 %	39	0	39
testColorGetterSetter()	100.0 %	17	0	17
testDefaultConstructor()	100.0 %	18	0	18
testGettersAndSetters()	100.0 %	21	0	21
testInvertColor()	100.0 %	25	0	25
testIsShadeOfGray()	100.0 %	27	0	27
testmoveHor()	100.0 %	11	0	11
testmoveVer()	100.0 %	11	0	11
testMovMeth()	100.0 %	18	0	18
testPrintPixel()	100.0 %	4	0	4
testSetBorder()	100.0 %	28	0	28
testTwoArgumentConstructor()	100.0 %	20	0	20

3) Work ahead and create a driver for this application

I made a driver application to demonstrate the features and capabilities of the Color and Pixel classes. It includes examples of creating colors and pixels, manipulating their attributes, and showcasing their behaviors.



Console × Problems Debug Shell Coverage

<terminated> Driver (1) [Java Application] /Applications/Eclipse.app/Contents/Eclipse/plugins/org.eclipse.justj.openjdk.hotspot.jre.full.macc

```
Default color (should be 0,0,0):
0,0,0
Custom color (should be 245,215,66):
245,215,66
Is color2 black? false
Is color2 white? false
Combined color2 and color3 (should be 0,0,0 or 255,255,255 depending on the combineColor logic):
0,0,0
Default pixel (should be at 0,0 with default color):
0,0: Color@136432db
Custom pixel (should be at 10,20 with custom color):
10,20: Color@5f205aa
Moved pixel2 (should be at 15,10):
15,10: Color@5f205aa
Is pixel2's color a shade of gray? false
Inverted color of pixel2:
15,10: Color@6d86b085
Adjusted brightness of pixel2:
15,10: Color@6d86b085
```

3. Grading Statement (Based on the rubric, what grade do you feel your work should be? Be honest, don't be humble, and use the rubric.)

Color Tests passed after implementation completed 5*6=30

Pixel Tests implemented as requested and pass with implementation 5*7=35

Pixel Implementation 5*2=10
Other (100% coverage) 10
Extensions 15
Creative or went above and beyond 10
Total 110

4. Academic Integrity Statement

I understand that my learning is dependent on individual effort and struggle, and I acknowledge that this assignment is a 100% original work and that I received no other assistance other than what is listed here.

Acknowledgements and assistance received:
TA Will
Canvas moduel 1
Invert Image Pixels: https://www.homeandlearn.co.uk/extras/image/image-invert-colors.html

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Name:Rong Huang	Date:1/24/2024