CMSC131

Basic 2D Graphics: Part II

Pixel class (for P4)

While we could use the Color class provided in the Java libraries, we will use a locally written class called Pixel in Project 4 to get a little more practice thinking about simple objects.

When you create a new Pixel object you will specify an amount of red, green, and blue to the constructor. These channels cannot be altered once the object is created. You can, however, get each channel’s value back out:

- getRed(): returns an int representing red in pixel
- getGreen(): returns an int representing green in pixel
- getBlue(): returns an int representing blue in pixel
Some Example Colors

```java
Pixel myRed = new Pixel(255,0,0);
Pixel myGreen = new Pixel(0,255,0);
Pixel myDarkerGreen = new Pixel(0,191,0);
Pixel myBlue = new Pixel(0,0,255);
Pixel myWhite = new Pixel(255,255,255);
Pixel myBlack = new Pixel(0,0,0);
Pixel myOrange = new Pixel(255,128,0);
```

Photograph class (for P4)

When you create a new Photograph object in the next project, you will specify a width and height to the constructor. These dimensions cannot be altered once the object is created.

The following instance methods are available:

- `getHt()`: returns an int representing its pixel height
- `getWd()`: returns an int representing its pixel width
- `getPixel(int x, int y)`: returns a reference to the Pixel in the specified x,y-coord position
- `setPixel(int x, int y, Pixel p)`: sets the Pixel in the specified x,y-coord position
Example: solid color

Imagine needing to write a helper method that is send a reference to a **Photograph** object and needs to paint it white.

```java
public static void helperWhite(Photograph theImage) {
    for (int x=0; x<theImage.getWd(); x++) {
        for (int y=0; y<theImage.getHt(); y++) {
            theImage.setPixel(x, y, new Pixel(255,255,255));
        }
    }
}
```

Note that “x” and “y” are meaningful variable names in this context!

Example: simple pattern

Imagine needing to write a helper method that is send a reference to a **Photograph** object and needs to paint the left half red and the right half blue.

```java
public static void helperLeftAndRight(Photograph theImage) {
    for (int y=0; y<theImage.getHt(); y++) {
        for (int x=0; x<theImage.getWd()/2; x++) {
            theImage.setPixel(x, y, new Pixel(255,0,0));
        }
        for (int x=theImage.getWd()/2; x<theImage.getWd(); x++) {
            theImage.setPixel(x, y, new Pixel(0,0,255));
        }
    }
}
```
Example: pattern with parameters

Imagine needing to write a similar helper method that not only gets a reference to a Photograph object but also to two Pixel objects and paints the top half using the first Pixel and the bottom half using the second.

The method signature could be:

```java
public static void helperLeftAndRight(
    Photograph theImage,
    Pixel firstPixel, Pixel secondPixel
)
```

Half and Half

```java
public static void helperLeftAndRight(
    Photograph theImage,
    Pixel firstPixel, Pixel secondPixel
) {
    for (int y=0; y<theImage.getHt(); y++) { 
        for (int x=0; x<theImage.getWd()/2; x++) {
            theImage.setPixel(x, y, firstPixel);
        }
        for (int x=theImage.getWd()/2; x<theImage.getWd(); x++) {
            theImage.setPixel(x, y, secondPixel);
        }
    }
}
```