

Java Programming II Lab2

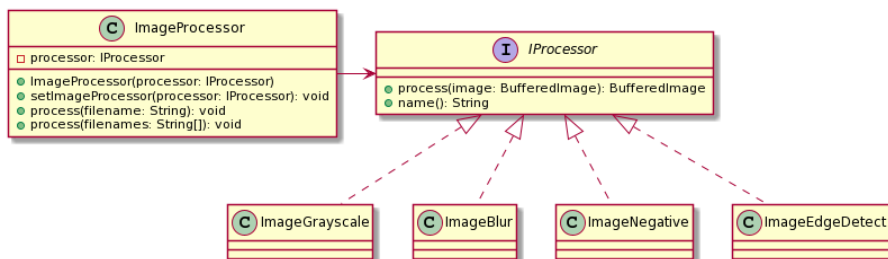
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Lab2

- Practice to write a **image processing** program that process file by **various image processing techniques** using **Strategy pattern**.
- Example
 - You can process images by using various techniques, such as grayscale, blur, adjust, negative, edge detect etc.
 - ImageProcessor class use different processing algorithm in process() method.

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□ ImageProcessor Strategy Pattern



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```
public class ImageProcessor {
    private IProcessor processor = null;
    public void process(String filename) {
        BufferedImage image = ImageUtil.load(filename);
        BufferedImage oImage = processor.process(image);
        String format = ImageUtil.getExtension(filename);
        String oFile =
            ImageUtil.getFullpathWithoutExt(filename)
            + processor.name() + "."
            + ImageUtil.getExtension(filename);
        ImageUtil.save(oImage, format, oFile);
    }
    public void process(String[] filenames) {
        . . .
    }
}
```

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```
public class ImageGrayscale implements IProcessor {
    @Override
    public String name() {
        return "Grayscale";
    }
    @Override
    public BufferedImage process(BufferedImage image){
        return grayscale(image);
    }
    ..
    // grayscale (in next slide)
}
```

```
public static BufferedImage grayscale(BufferedImage
image) {
    if (image == null) return null;
    BufferedImage outImage =
        new BufferedImage(image.getWidth(),
            image.getHeight(), image.getType());
    for (int y = 0; y < image.getHeight(); y++) {
        for (int x = 0; x < image.getWidth(); x++) {
            Color c = new Color(image.getRGB(x, y));
            // NTSC brightness formula
            int b = (int) (c.getRed() * 0.299) + (int)
(c.getGreen() * 0.587) + (int) (c.getBlue() * 0.114);
            Color grayColor = new Color(b,b,b);
            outImage.setRGB(x, y, grayColor.getRGB());
        }
    }
    return outImage;
}
```

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- In MainTest class, the 2~3 images are processed using 4~5 different image processing techniques.

```
public class MainTest {
    static IProcessor[] processors = ... // 4~5
techniques
    static String[] imageFiles = ... // 2~3 images
    public static void main(String[] args) {
        for (IProcessor processor : processors) {
            ImageProcessor ip =
                new ImageProcessor(processor);
            ip.process(imageFiles);
        }
    }
}
```

Submit to e-learning

- Add your code (e.g., additional method, class, routine, etc) in the Lab2 assignment.
- Submit [Java21-2-HW2-YourID-YourName.zip](#) (including the report) to e-learning **due by 9/26**.