# Hands-on Experiment # 9-2 : Worksheet

Section\_\_\_\_\_\_1\_\_\_\_\_\_\_ Date\_\_\_\_\_\_\_\_\_\_31/03/2020\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

No more than 3 students per one submission of this worksheet.

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## Part A: Understanding Given Resources/Backgrounds

1. Get yourself familiar with the RGB color model. Play around with the color picker on <http://www.colorpicker.com/> and answer the following questions.
   1. What color is it that has the maximal value in R, the maximal value in B, and 0 in G? Capture the picture of the color and post it here.

Max R = RED

A picture containing drawing

Description automatically generated

Max B = BLUE

A picture containing drawing

Description automatically generated

Max G = GREEN

A picture containing drawing

Description automatically generated

* 1. What are the requirements on the RGB values for all shades of gray?

They all have to be of the same values to represent shades of gray

(i.e. value of R = G = B)

1. Read the API specification of the class *Java101ImageUtil* in *L09-2.pdf*.
   1. How many static methods are there in the class?

6

* 1. How many overloaded methods are there in the class?

3

* 1. Write the “method signatures” of all the overloaded methods. (\*\* Write only the signature)

showViewer(int [][][] rgb, String title)

showViewer(int [][][] rgb1, int [][][] rgb2, String title)

showViewer(int [][][][] rgbs, String title)

1. Read the source code of *Java101ImageUtilExample.java* and try executing the program. Briefly explain what the program does. (\*\* It is recommended NOT TO open big images. The program was not optimized in any ways. Try the program on some images with a few hundreds of pixels in their width/height)

The program opens an image and allows a user to do the following:

1. Display the image
2. Display the image + Display its 180-degree rotation
3. Display the image + Display its 180-degree rotation + Display a red patch

## Part B: Creating RGB arrays for Desired Images

1. Write a program performing the following steps.
   1. Create a 3-D array of int that when used with showViewer(int [ ][ ][ ],String), the program shows a 64-pixel x 128-pixel all-white image.
   2. Show the image with showViewer(int [ ][ ][ ],String)

List your source code here.

A screen shot of a smart phone

Description automatically generated

1. Write another program performing the following steps.
   1. Ask the user to input the value of w and h, which are integers in the range of 100 to 200.
   2. Show an image of a triangle as shown in the figure below. Use the colors of your choice.

w/2

w/2

h

List your source code here.

A screenshot of a cell phone

Description automatically generated

A picture containing drawing

Description automatically generated

## Part C: Image Manipulation

Modify *DesaturateIt.java* to obtain a Java program performing the following steps.

1. Ask the user to select a gif or a jpg file.
2. Show the original image and its “desaturated” (grayscale) version using showViewer().



Explain how the grayscale values are computed.

For each pixel with value (R, G, B),

Total = (R + G + B) is calculated, then divided by 3

Then the grayscale pixel is represented by R = G = B = (Total/3)

List your source code here.

A screenshot of a cell phone

Description automatically generated

Submit this worksheet (by only one member of the group) via <http://www.myCourseVille.com> (Assignments > Hands-on Experiment # 9-2) **within the day after your lecture.**