RIT | Golisano College of Computing and Information Sciences
School of Information

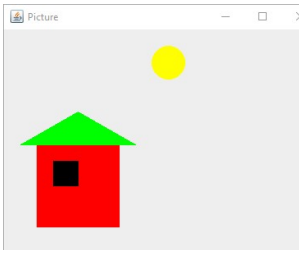
Name: _____

ISTE-120
Lab 02: Objects: Constructors, Accessors, Mutators

This assignment relates and contributes to the course learning outcomes: CLO1

Exercise 1 - Get a Picture on the Screen (2 points)

The exercise must be completed during the lab period.



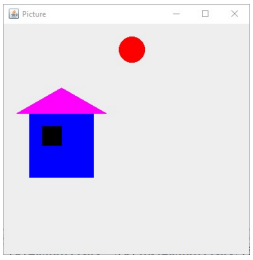
1. Download the **Lab02Downloads** zip file from myCourses and unzip it to a folder on your computer.
2. Create project containing **Picture.java** in VSCODE. In the same project, create (or modify an existing file) a new java file named **TestPicture.java**. In this class, create a main program that creates an instance of the **Picture** class and invokes its **draw** method. This should draw a picture like the one to the right.

Exercise 2 - Change source code to change colors (3 points)

The exercise must be completed during the lab period.

1. Make a copy of **Picture.java** in a file named **Picture1.java**. Rename the class and constructor in **Picture1.java** from **Picture** to **Picture1**.
2. Make a copy of **TestPicture.java** in a file named **TestPicture1.java**. Change the main program to use the **Picture1** class, instead of **Picture**.
3. Change the source code of the **draw** method in **Picture1.java** to make the picture use different colors as follows:

Wall:	blue
Roof:	magenta
Sun:	red



After making the changes to the colors, recompile the **Picture1** class. Run the **TestPicture1** program.

Exercise 3 - Changing colors on the fly (4 points)

If you do not complete this exercise during the lab period, you need to complete the work outside of the lab period until the DUE date.

1. Make a copy of **Picture.java** in a file named **Picture2.java**. Rename the class and constructor in **Picture2.java** from **Picture** to **Picture2**.
2. Make a copy of **TestPicture.java** in a file named **TestPicture2.java**. Change the main program to use the **Picture2** class, instead of **Picture1**.
3. Add two methods to the Picture2 class. The first
   ```
   public void setNewColors()
   ```
   will change the colors of the roof, the wall, and the sun to the new colors (MAGENTA, BLUE, and RED).

   To change the color of a shape, use the setColor mutator. The wall, roof and sun objects are shapes. Then, force the canvas to redraw itself with the canvas.redraw() method.

   The second method is
   ```
   public void setOrigColors()
   ```
   and will change the colors of the roof, wall, and sun to their original colors (RED, GREEN, and YELLOW);
4. In **TestPicture2.java**, add the line:
   ```
   import java.util.*;
   ```
   as the very first line of the file (before the "public class" line).

   Also, as the first line of the main program add the line
   ```
   Scanner in = new Scanner(System.in);
   ```

   Now, after drawing the original picture, add the following code:
   ```
   System.out.println("Press Enter to continue:");
   in.nextLine();
   pic.setNewColors();
   ```

   Now, run **TestPicture2**. It will draw the picture with the original colors. Also, if you watch in jGRASP in the Run I/O output in the lower right pane, you will see the message:
   ```
   Press Enter to continue:
   ```
   (where does this come from? If you don't know, ask!). The in.nextLine() waits for you to press Enter (you may have to click inside the Run I/O window for jGRASP to hear you). What happens when you do?
5. Finally, add to the end of the main program code (very similar to the three lines above) code to wait for the user to press Enter and then change the colors back to their original colors.

Exercise 4 – More With Methods (1 point)

If you do not complete this exercise during the lab period, you need to complete the work outside of the lab period until the DUE date

Objective

The objective of this exercise is to use the methods of the Canvas and other classes we have already seen to further manipulate the picture.

1. Make a copy of **Picture2.java** in a file named **Picture3.java**. Rename the class and constructor in **Picture3.java** from **Picture2** to **Picture3**.
2. Make a copy of **TestPicture2.java** in a file named **TestPicture3.java**. Change the main program to use the **Picture3** class, instead of **Picture2**.
3. When the new colors are applied to the picture, also make the sun disappear. This is accomplished by erasing the sun object from the canvas with
   ```
   canvas.erase(sun);
   ```
4. You can make the sun reappear when the program reapplies the original colors by simply using
   ```
   canvas.draw(sun)
   ```
   to put the sun back.