Contestant Number: _____

Time: _____

Rank: _____

JAVA PROGRAMMING
(340)

NATIONAL – 2019

Production Portion:

Program 1: Traffic Light _____ (345 points)

TOTAL POINTS _____ ***(345 points)***

Failure to adhere to any of the following rules will result in disqualification:

1. **Contestant must hand in this test booklet and all printouts. Failure to do so will result in disqualification.**
2. **No equipment, supplies, or materials other than those specified for this event are allowed in the testing area. No previous BPA tests and/or sample tests or facsimile (handwritten, photocopied, or keyed) are allowed in the testing area.**
3. **Electronic devices will be monitored according to ACT standards.**

No more than ten (10) minutes orientation
No more than ninety (90) minutes testing time
No more than ten (10) minutes wrap-up

You will have ninety (90) minutes to complete your work.

Your name and/or school name should *not* appear on work you submit for grading.

1. Create a folder on the flash drive provided using your contestant number as the name of the folder.
2. Copy your entire solution/project into this folder.
3. Submit your entire solution/project so that the graders may open your project to review the source code.
4. Ensure that the files required to run your program are present and will execute on the flash drive provided.

   *Note that the flash drive letter may *not* be the same when the program is graded as it was when you created the program.

   * It is recommended that you use relative paths rather than absolute paths to ensure that the program will run regardless of the flash drive letter.

   The graders will *not* compile or alter your source code to correct for this.
   Submissions that do *not* contain source code will *not* be graded.

Assumptions to make when taking this assessment:

- The traffic light will have 3 round lights (red, yellow, green) and a rectangular casing

Development Standards:

- Your Code must use a consistent variable naming convention.
- All subroutines, functions, and methods must be documented with comments explaining the purpose of the method, the input parameters (if any), and the output (if any).
- If you create a class, then you must use Javadoc comments.

Traffic Light

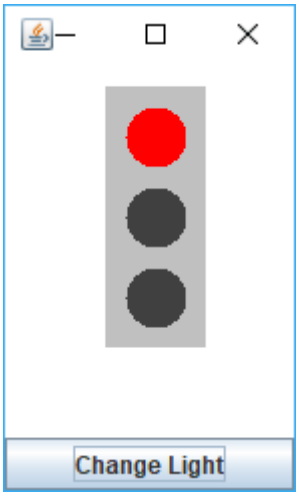
You have been tasked with designing and implementing an application that draws a traffic light and uses a push button to change the light. To accomplish this task, you should derive the drawing surface from the JPanel class and use another panel to organize the drawing surface and the button.

Input:

The user will press a button to change the light.

Output:

The application should look similar to the figure below.



Requirements:

1. You must create an application with the main class named *TrafficLight.*
2. You must create an additional class within the application named *TrafficControlPanel* and *TrafficLightPanel.*
3. Your contestant number must appear as a comment at the top of the main source code file.
4. The program must implement methods to:
   a. Set the layout for the traffic light panel
   b. Set dimensions for the traffic light
   c. Paint the traffic light
5. The program will display the output like the example above for all of the values in the input file.

Your application will be graded on the following criteria:

Solution and Project

The project is present on the flash drive	_____	10 points
The projects main class is named **TrafficLight**	_____	10 points
The projects helper class is named **TrafficLightPanel**	_____	10 points
The projects helper class is named **TrafficControlPanel**	_____	10 points

Program Execution

The program runs from the USB flash drive	_____	15 points

If the program does *not* execute, then the remaining items in this section receive a score of zero.

The program displays the stop light with the button activated	_____	30 points
The program displays the red light in the correct position and color	_____	20 points
The program displays the yellow light in the correct position and color	_____	20 points
The program displays the green light in the correct position and color	_____	20 points
The program displays the stoplight casing in an appropriate color around the round stop lights	_____	20 points
The program changes the light position and color when the button is pressed	_____	30 points
The program displays the stop light at an appropriate size for JPanel (not full screen)	_____	10 points

Source Code Review

The source code is properly commented		
A comment containing the contestant number is present	_____	10 points
Methods and code sections are commented	_____	20 points
A method exists to set the panel layout	_____	20 points
A method exists to set the dimensions of the traffic light	_____	20 points
A method exists to paint the traffic light	_____	20 points
Code extemds JPanel for TrafficLightPanel class	_____	20 points
Code extends JPanel for TrafficControlPanel class	_____	20 points
Code uses a consistent variable naming convention	_____	10 points

Total Points = 345