The City College of New York, CUNY
Department of Compute Science
North Academic Center, Room 8/206
160 Convent Avenue, New York, NY 10031

Assignment 5 – Fall 2020

Due Date: *by Sunday November 22, 2020 11:59PM*
How to submit: *compress and upload source files to Blackboard*

JavaFX.

In this assignment we utilize Java's FX technology and object serialization to add functionalities to an existing application. Chapters 12, 13, and 15 are particularly helpful.

Note:

- ✓ ***This is an individual assignment; please do your own work, sharing and/or copying code and/or solution ideas with/from others will result in a grade of 0 and disciplinary actions for all involved parties. If you run into problems and have done your best to solve them, please contact me before/after class or by e-mail.***
- ✓ ***A 20% grade deduction for every day the assignment is late.***

Preamble

Before you begin working on this assignment, download the three accompanying files ($Main.java, Controller\_Assignment5.java$, and $Assignment5.fxml$). Crate a new $JavaFx$ project using the defaults shown during class. Remember to set the language to $FXML$; the project's name maybe set to anything you would like. If you use a different IDE, please adjust your project's parameters accordingly. The package name is assumed be $application$, the controller's name is $Controller\_Assignment5$, and the driver class is $Main$.

Once the project is created, copy the provided files and overwrite the ones generated by your IDE. Next launch the application, it should look like the one in Figure 1. Do not proceed beyond this point unless you complete this step and you fully test the initial application's functionalities.

What to submit?

1. $Assignment5.fxml$
2. $Controller\_Assignment5.java$
3. $Main.java$
4. Any new classes added for XML serialization

Next, add the following features, the finished application must look like the one in Figure 2:

I. (30pts) GUI Controls

1. Set the title of the window such that it displays your name.
2. Change the font color for each of the drawing colors to reflect its name
3. Add a new $brown$ drawing color
4. Add a new pen size for $X - Large$ circles
5. Add a new button with label "$Serialize\ to\ XML$"
6. Add the labels and slider above the drawing panel as shown in Figure 2.
   Hint:
   - ✓ wrap the drawing panel in a $BorderPane$ before adding the control in order for the panel to resize with the window.
   - ✓ Set the slider properties:
     - Min value: 0
     - Max Value: 255
     - Major Ticks: 25
     - Minor Ticks: 3

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II. (70pts) Events

1. (5pts) Draw circles using brown color
2. (5pts) Draw circles using X-Large pen
3. (30pts) Serialize to XML. When this button is clicked, show a file open dialog box which allows for the selection of an XML file. Use JavaFX *FileChooser* class detailed in Chapter 15 slides 72-88. Next, serialize all drawn circles into the selected XML file. One way to achieve this process is as follows:
   i. Create a POJO class (e.g. *A5Shape*) with three members for *x coordinates*, y coordinates, and *radius*. This is similar to the class on slide 52 in Chapter 15. Note that we are skipping the circle's color.
   ii. Create a container class to hold objects of type *A5Shape* in an *ArrayList* name the class *ListA5Shape*. See slide 59 of Chapter 15 for an example.
   iii. For every drawn circle on the panel, create an object of type *A5Shape* and add it to the *ArrayList* in *ListA5Shape*.
   iv. Using JAXB, serialize the objects to the XML file. See Slides 60 – 62 of Chapter 15.
4. (30) Background Slider. When the slider is dragged to the right the drawing panel's background gets a higher blue construction. See Figures 3-5.
   Hint:
   ✓ The background color can be set using the style property. The following example changes the background to GREEN by specifying the RGB color value in hexadecimal format:

panelDraw.setStyle("-fx-background-color: #0000FF") ← Sets the background of *panelDraw* to blue
panelDraw.setStyle("-fx-background-color: #FFFFFF") ← Sets the background of *panelDraw* to white. This happens when the slider's value is 0.

   ✓ Integer values maybe converted to hex using *Integer.toHexString*
   ✓ The slider's change event maybe set as shown in slide 94 in Chapter 12.

Figures:

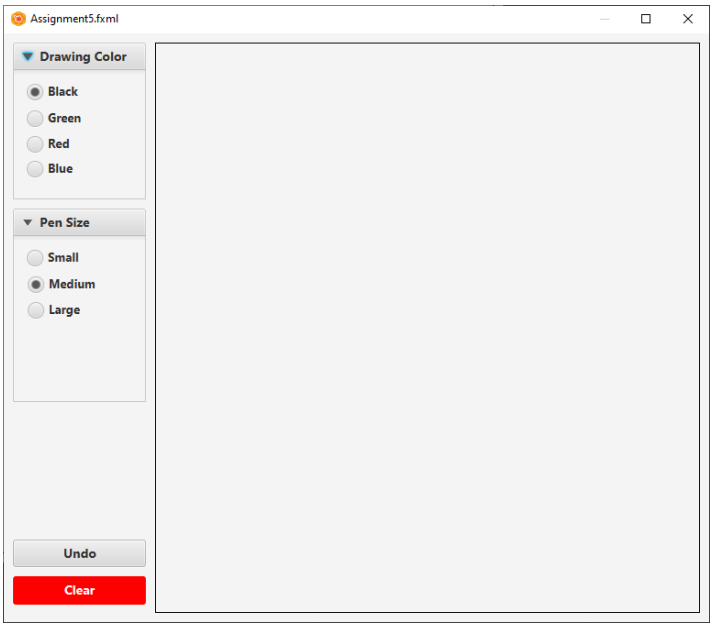

Figure 1: Initial Window

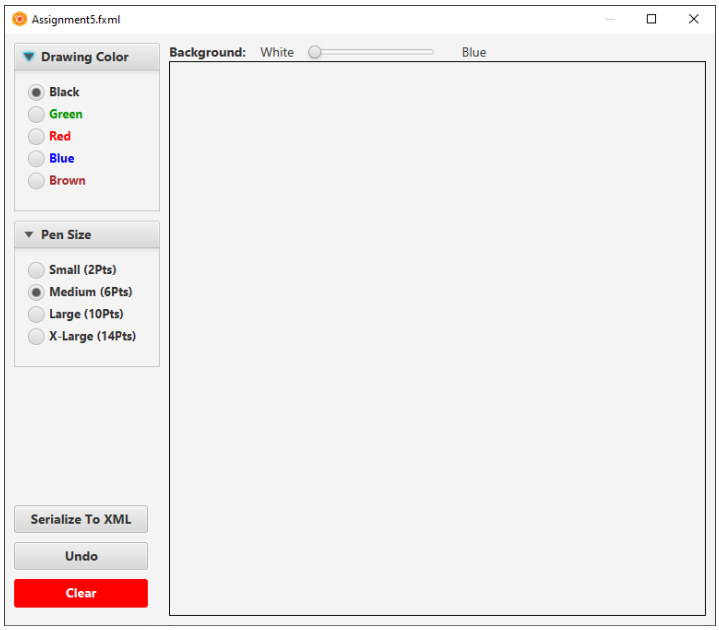

Figure 2: Final Window

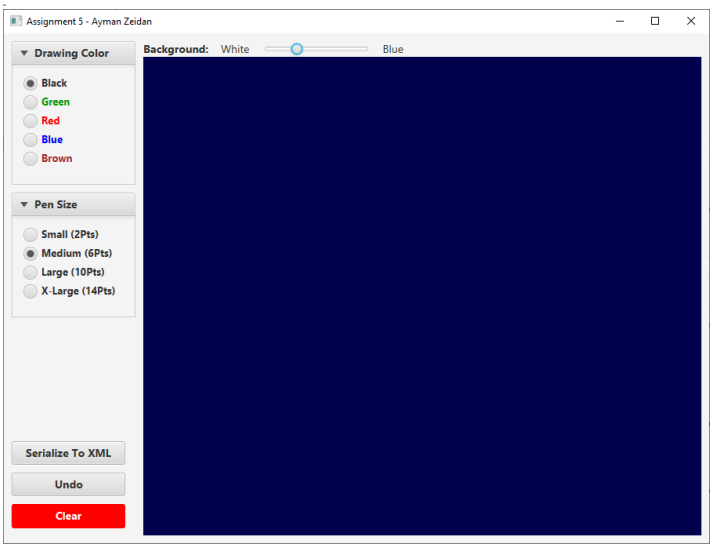

Figure 3: Blue slider about a 1/3 of the way into blue

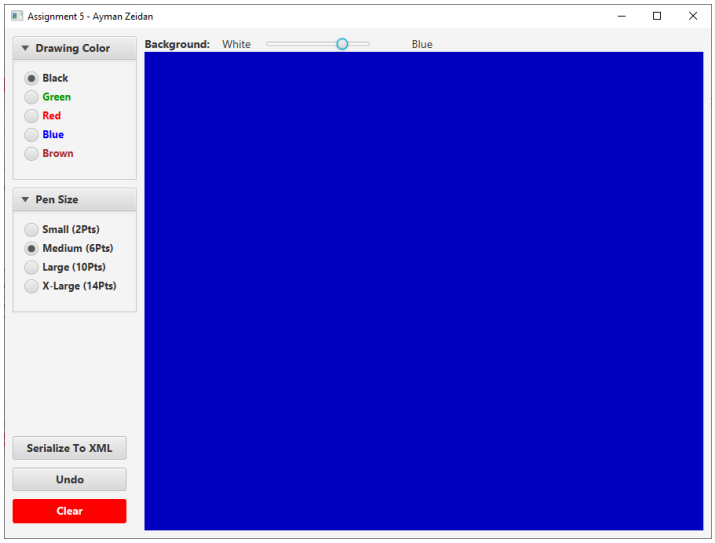

Figure 4: Blue slider about 2/3 of the way into blue

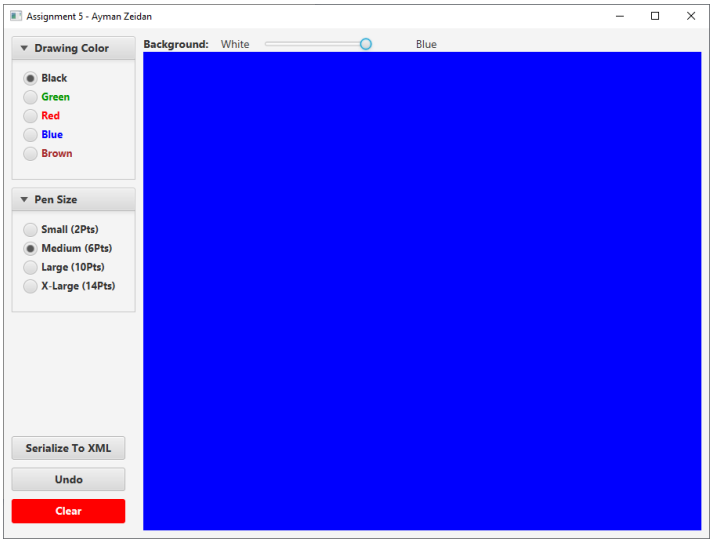

Figure 5: 100% Blue

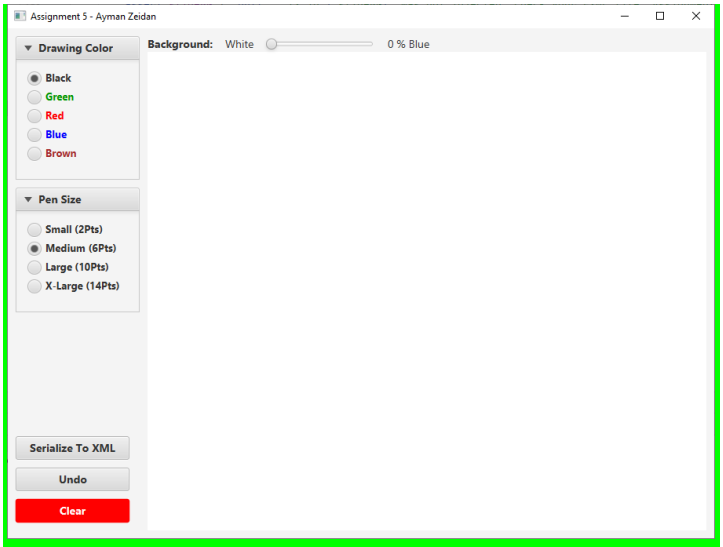

Figure 6: Back to white