Lab – Java – JavaFX 2D Shapes and Transformations

Overview

Write a JavaFX application that uses 2-dimensional shapes and performs transformations on them.

Create a FXML GUI Application

Create a new Java FXML GUI application

Create the Window

Setup the window as follows:

- Remove the default button and label that appear when you open the project.
- Add a Pane to the VBox. Set the fx:id on the Pane.
- Set the Pane's Pref Width to 600 and Pref Height to 400 (these properties are in the Layout area in Scene Builder).
- Add a Circle and Rectangle to the Pane. Set the fx:id on each shape.

Here is a screenshot:



Add an HBox

Add an HBox as the first child of the VBox. We will be adding buttons to the application, and they will be placed in the HBox.

Transformation – Translate Rectangle

Add a button to the HBox. It should have code to make the rectangle be translated by 100 to the right. Here are screenshots before and after pressing the button:

10 10	-	×		-	×
Rect Right 100			Rect Right 100		

Transformation – Translate All Shapes in Pane

Add a button to the HBox that will cause all the shapes in the pane to be translated by 100 to the right. You will need to get the child nodes of the pane and apply the transformation to each node. Here are screenshots before and after pressing the button:

	-	×	The second secon	-	×
Rect Right 100 All Right 200			Rect Right 100 All Right 200		

Transformation – Rotate Rectangle

Add a button to the HBox that will cause the rectangle to be rotated 60 degrees. Here are screenshots before and after pressing the button:



(Optional) Transformation – Rotate Rectangle on Center of Rectangle

Update the rectangle rotate transformation so that it rotates around the center of the rectangle. Here are screenshots before and after pressing the button:



Hint: You will need to set the pivot point on the rotate translation object.

Transformation – Scale Circle

Add a button to the HBox that will cause the circle to be scaled to 2 times its size. Here are screenshots before and after pressing the button:



(Optional) Transformation – Scale Circle by Top Left Corner

Update the scale transformation so that it will scale relative to the top left point of the circle. Here are screenshots before and after pressing the button:



Hint: You will need to set the pivot point on the scale translation object. Pass a value of the circle's radius times -1 to the setPivotX and setPivotY methods (this will reduce the pivot point values).