

Programming(II) Assignment 5 Report

Made by:

Mazen Ahmed Ramzy 6999

Adham Aboul Kheir 6710

Mazen Ahmed Ghanem 6896

Introduction:

Drawing and painting applications are very popular and have a huge user base. They generally offer a big number of features that includes but is not limited to: Drawing, Coloring, and Resizing. They allow the user to undo or redo any instructions so as to make the application more usable.

Description:

The code consists of two part, first part is the back end code which consists of multiple classes (Shape, Circle, Square, line, Triangle, Rectangle).

Second part is the GUI part which contains of the Drawing panel and the action buttons and coloring section

Part One:

1-Shape Class:

It's an abstract public class which contains two private variables (color, fill shape) at also contain an abstract method called contains which takes two integer parameters x, y and returns a Boolean value, used to make sure the shape has been selected It also contains setters and getters for the variables.

2-Line Class:

It's a class which extends class shape and implements Cloneable .it contains four private variables (x1, y1, x2, y2), it has a constructor takes the four variables and Boolean fillshape from parent class.it has a method called contains which takes a two integers as a point to check if this point inside the selected line or not.it also has a method called Clone which return a copy of the selected line.

3-Square Class:

It's a class which extends class shape and implements Cloneable .it contains four private variables (x1, x2, y1, y2), it has a constructor takes the four variables and Boolean fillshape and color from parent class.it has a method called contains which takes a two integers as a point to check if this point inside the selected Square or not.it also has a method called Clone which return a copy of the selected square.

4-Rectangle Class:

It's a class which extends class shape and implements Cloneable .it contains four private variables (x1, x2, y1, y2), it has a constructor takes the four variables and Boolean fillshape and color from parent class.it has a method called contains which takes a two integers as a point to check if this point inside the selected rectangle or not.it also has a method called Clone which return a copy of the selected rectangle.

5-Triange Class:

It's a class which extends class shape and implements Cloneable .it contains six private variables (x1, x2, x3, y1, y2, y3), it has a constructor takes the six variables and Boolean fillshape and color from parent class.it has a method called contains which takes a two integers as a point to check if this point inside the selected Triangle or not.it also has a method called Clone which return a copy of the selected triangle.

6-Circle Class:

It's a class which extends class shape and implements Cloneable .it contains four private variables (x1, x2, y1, y2), it has a constructor takes the four variables and Boolean fillshape and color from parent class.it has a method called contains which takes a two integers as a point to check if this point inside the selected circle or not.it also has a method called Clone which return a copy of the selected circle.

Part Two:

1-GUI Class:

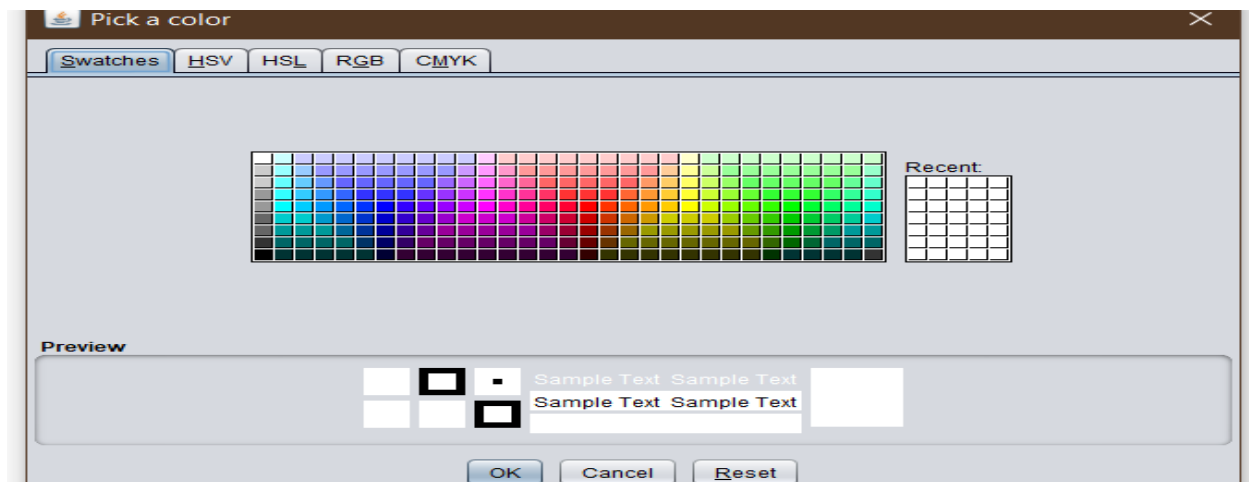
it's a public class extends javax.swing.JFrame, as it's the GUI,

The GUI has multiple buttons six of them are for the shapes, when the user chooses any of them mode number will be changed and draw the selected shape.

it has a check Box called fill which determines if the shape will be filled with the selected color or not.

It also has action buttons which are: Color, Delete, Resize, Move, Copy, Redo, Undo. When any of them is pressed it change the type so that the code will continue in different way to do this task.

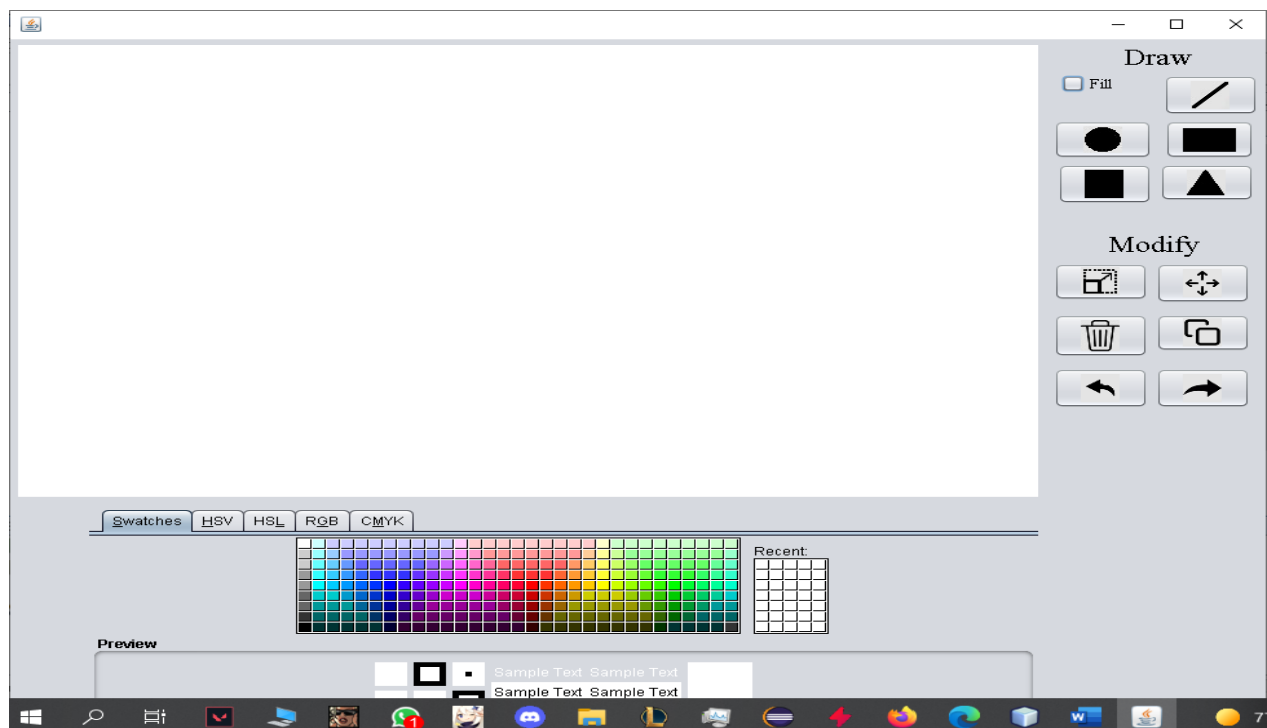
The user chooses color from a multicolor window



2-BOARD Class:

It's a public class extends JPanel implements MouseListener, MouseMotionListener. It has 11 attributes:

It has a private constructor to implement the design pattern "Singleton" it also overrides "PaintComponent" method which takes Graphics g as a parameter. then it loops on an Array List of shapes and check the type of the shape and get the color chosen by the user then it calls the function which draw this shape after checking the values if (x1, y1, x2, y2) to determine the quadrant the shape lies in. all these parameters go to the DrawFactory class, to implement Factory design pattern, to draw the shape in the board.



Mouse Pressed function:

This function works when the user press using mouse on the drawing area, when this action happen it gets the coordinates of the pressed point (x1, y1).

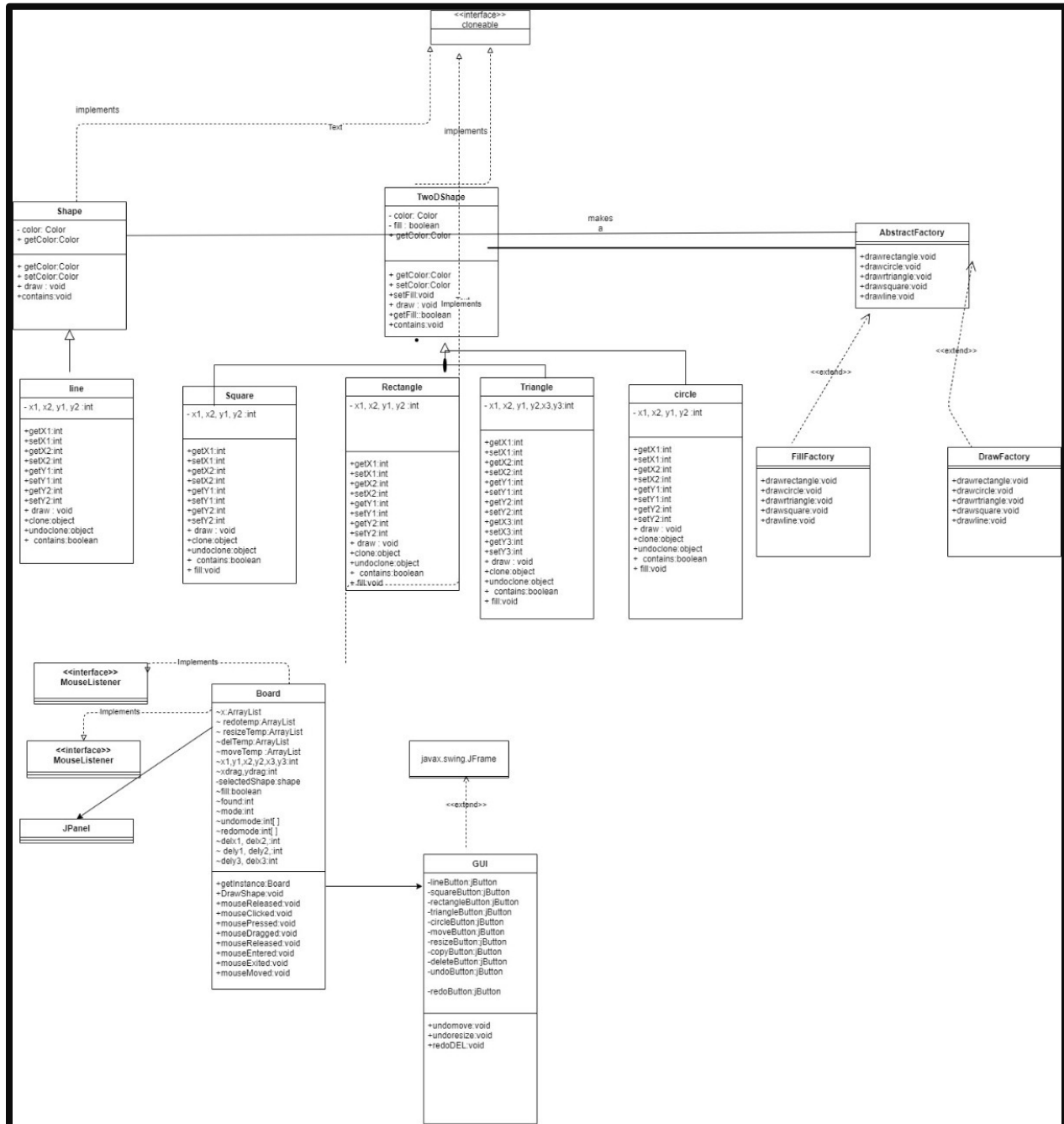
When the user chooses any of drawing shapes the type will be changed to 1, 2, 3, 4, 5 or 6 then this function will check the type and create instance of this shape by calling a method to create shape from Factory class and give it parameters (type, x1, x1, y1, y1, color, fill) then it adds it to array list if shapes then it calls function repaint which draw all the shapes in the array list again. If type =7 then when the mouse be pressed it will delete the shape contains this point. if type =8 then when the mouse be pressed it will copy the shape contains this point. if type =6 then when the mouse b be pressed it will move the shape contains this point. if type =5 then when the mouse be pressed it will resize the shape contains this point.

MouseDragged function:

this function works when the user drag using mouse on the drawing area, when this action happens it gets the end point (x2, y2). if type is for shape draw (1, 2, 3, 4, 5, 6) the function get the last shape in the shape list then update its end coordinates the calls repaint function to draw all the edited shapes again.

If the type=5 the function will check the type of the shape, then update its length and width using the value of x2, y2 to resize it. If type=10 the function will check the type of the shape and update its starting point to move it.

Action diagram



User Case diagram

