Real image of the project

Paint

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Content

Description of the project

This **paint program** is a software graphics program allows the user to draw different shapes

Project Features:

Ⅰ.supports various shapes such as: Line, Circle, Ellipse, Triangle, Rectangle, Square, RoundRectangle.

Ⅱ. Drawing, Coloring, Moving and Resizing

Ⅲ.supports save and load using different file formats such as XML and JSON

Ⅳ.supports redo and undo.

Overview of the design
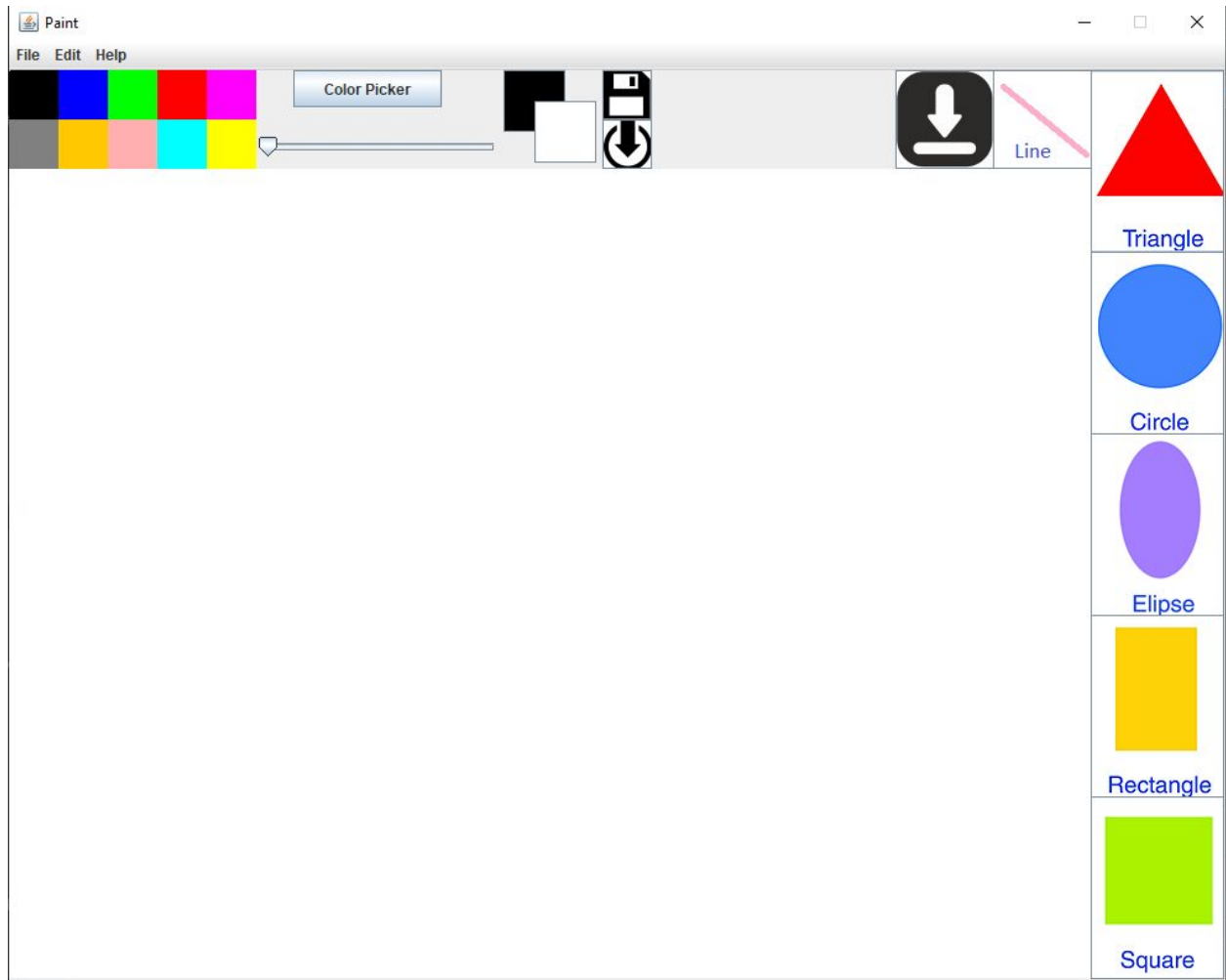
Simply we implemented 6 supported shapes as the picture illustrate plus an additional shape which can be loaded dynamically called "RoundRectangle".

As shown in the UML Diagram below, We implement Ellipse, Rectangle, Triangle and Line and used OOP concepts like inheritance for Square and Circle since they both share the same properties respectively with Rectangle and Ellipse.

For the GUI, We have used the in-built java GUI library called "Swing".

We have implemented multiple features such as

Select: We used a Geometry Handler class to check whether a point is inside a Shape or no.

Move: For the selected shape you can drag it across the canvas this is done by adding the change in x and y coordinates of the mouse to the shape.

Resize: Simply implemented by redrawing the shape again but for the triangle we took the simple approach of being able to move any of the 3 ends of the Triangle

Delete: You can delete any selected Shape.

Coloring: The program has two colors as illustrated into the two squares, The front one is Fillcolor and the rear is the border color. You can select one of them then quick select one of the colors in the top left corner of the program or you can just click on Color picker to get a wider range of colors.

Stroke Width: Every shape has Stroke width for its border you can adjust that by moving the slider.

Save and load buttons: Choose either save or load then type the file name and choose the file format.

Dynamic Loading: Lets you browse where the jar is placed and load it then the button will become a new Shape option, We have used a URLClassloader and some regex to read what classes are in the jar and whether they implement the interface or not. We have attached a testing jar for that.

For the redo/undo, We simply created an interface called Command and made some classes that implement this interface such as ShapeAddition, ShapeEdition.

What ShapeAddition simply does is that it takes a copy of all shapes and stores before and after the command.

However in ShapeEdition it takes a copy of the object and replaces in undo/redo. To find out which shape it is we created a UUID generator to create an ID for each shape to distinctively distinguish the shapes from each other.

UML Class Diagram
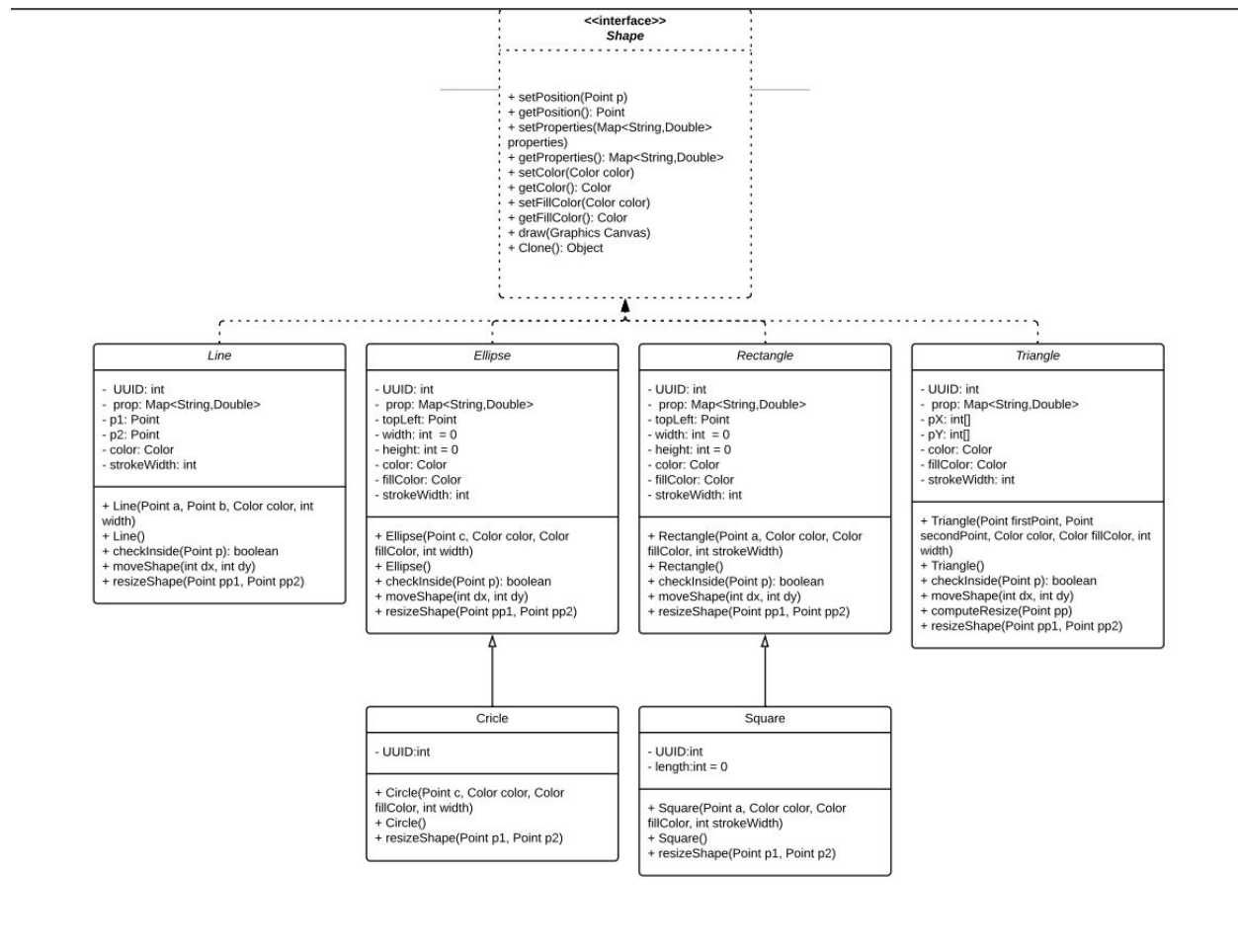
For a better look, There is a PDF file attached with the project

User manual

In the right section you can choose the shape you would like to draw

Triangle

Circle

Elipse

Rectangle

Square

In the upper part from left to right you can choose your preferred color for border color or fill color

Or you can click on color picker and choose more colors.

Behind it there is a slider which controls the stroke width of the shapes.

Then there is a two color the front one is the fill color and the back one is the stroke color.

After that there are two images for saving and loading. Use the upper one to save and the dowen one to load.

And finally there is a button to add classes dynamically at runtime.

For moving and resizing choose it from the menu bar under edit.

Press **Z** in you keyboard to undo

Press **Y** in your keyboard to redo