Final Project
Paint Program

Made By: -

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1. Program Interface

1.1 Overall Overview

Our Paint Program is a simple application made by the Java programming language. Java is a high-level, classed-based, object-oriented language which can be used in development of various types of applications.

Our project is a paint program that is used to draw various types of geometrical shapes with different colors and customizations. On running the application our GUI starts as shown in Figure 1.1. It mainly consists of a white board for the drawing and buttons below to draw the desired geometric shapes. The color of the shapes can be controlled through the swatches.

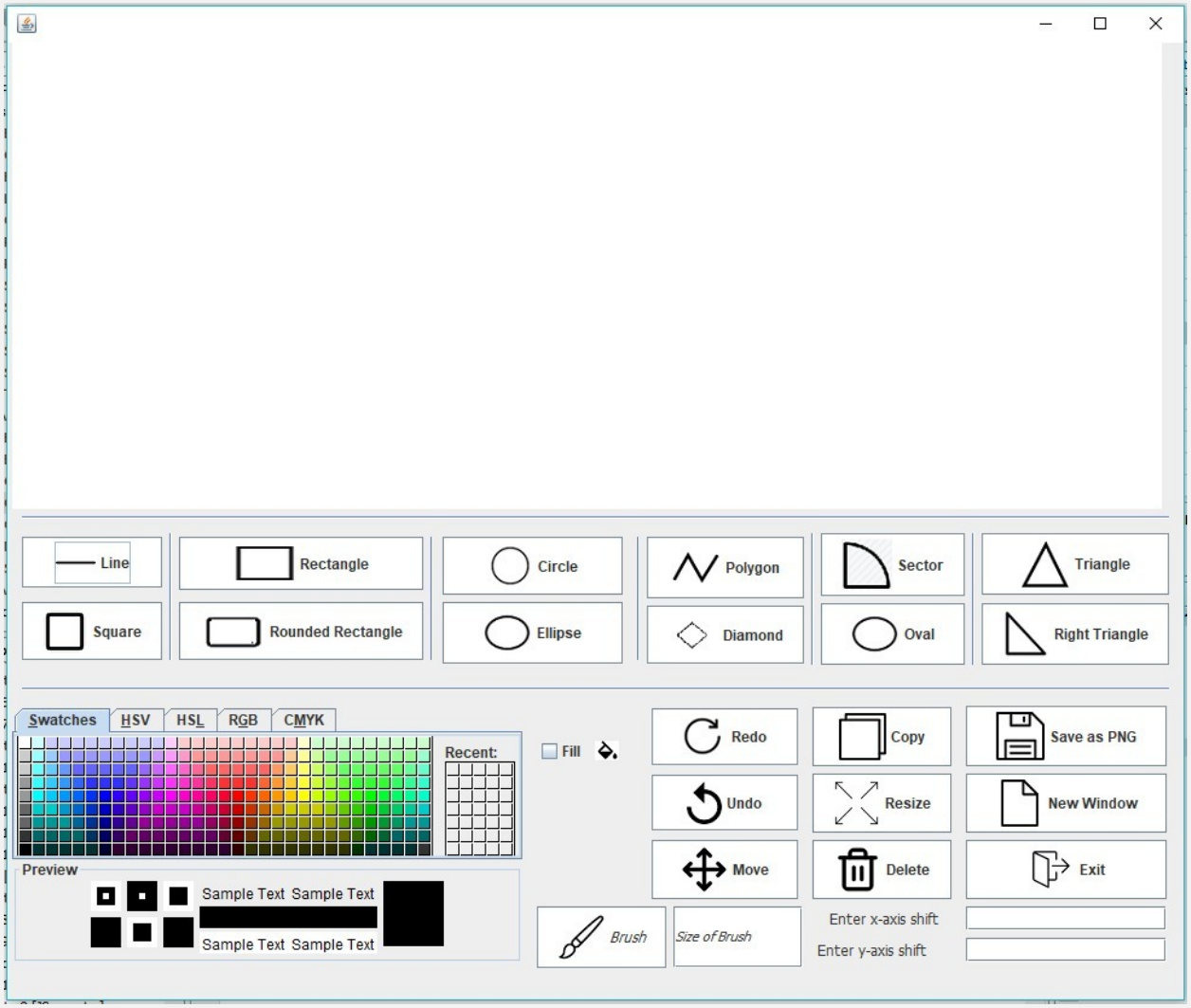


Figure 1.1

1.2 Available Geometrical Shapes

Buttons	Functionality
Line	To draw a line segment joining two points by dragging the mouse in any area
Square	Is used to draw a square with equal sides and right angles
Rectangle	Is used to draw a simple rectangle with specific length and width according to mouse dragging.
Rounded Rectangle	Is used to draw a simple rectangle with rounded corners.
Circle	Is used to draw a circle whose radius depends on mouse dragging
Ellipse	Is used to draw semi-oval or semi-rectangle shape
Polygon	Is used to draw a polygon with n-number of lines.
Diamond	Is used to draw a square with a rotation around the y-axis of 45 degrees.
Sector	Is used to draw a sector of a circle from 0 to 360 degrees
Oval	Is used to draw a perfect ellipse with 2 axes.
Triangle	Is used to draw a 3-sided shape.
Right Triangle	Is used to draw a triangle with a right angle.
Brush	The brush tool is used for free hand sketching without any constraints. The default size of the brush is 10 and it can be controlled through the text field next to it.

1.3 Functional keys

Buttons	Functionality
Undo	Is used to return a backward step and delete the last edit on the whiteboard.
Redo	Is used to reverse the Undo button and move a step forward.
Resize	After clicking this button, you can select any shape to resize it to be bigger or smaller in the same place.
Delete	Is used to clear the whole whiteboard
Move	Is used to move the selected element into a different position
Copy	Is used to duplicate the selected shape and get a copy
Save as PNG	Is used to save your work as ONG which is stored in the same file of the project
New window	Is used to close the current window and open a new clean whiteboard
Exit	Is used to exit the program

2. Coding of the program

Our Program is composed of 2 main Folders: -

1. Classes
2. View

Classes consist of the classes which are responsible for the implementation of the logic of drawing the different geometrical shapes. Mathematics rules for each geometric shape are used in each class to correctly draw the desired shape with specified coordinates and lengths.

View consists of the GUI and Board class which specifies the functionality of each button and the calling of Shapes classes in the Classes folder.

2.1 Classes folder

The structure of our program depends on the abstract class Shapes which consists of the basic properties of any shape like the coordinates. There is also an abstract method which is draw (). It is a common and important method for all shapes, but its logic differs from one shape to another.

2.2 View Folder

It includes the GUI displayed to the user and on clicking on any button it chooses a specific mode for each functionality. For example, the line shape button chooses mode 0. The board class uses mouse listeners to get the coordinates of the mouse on pressing and dragging to draw the shapes from the Classes folder according to the modes selected.

3. User Guide

3.1 Creating Shapes: -

1. This is done by clicking with the mouse on the button with the target shape as shown in Figure 1.1.
2. Clicking on any place on the white board where the 1st coordinates of the shape.
3. Drag the mouse to indicate the size of the shape.
4. Release the mouse and the shape is constructed.

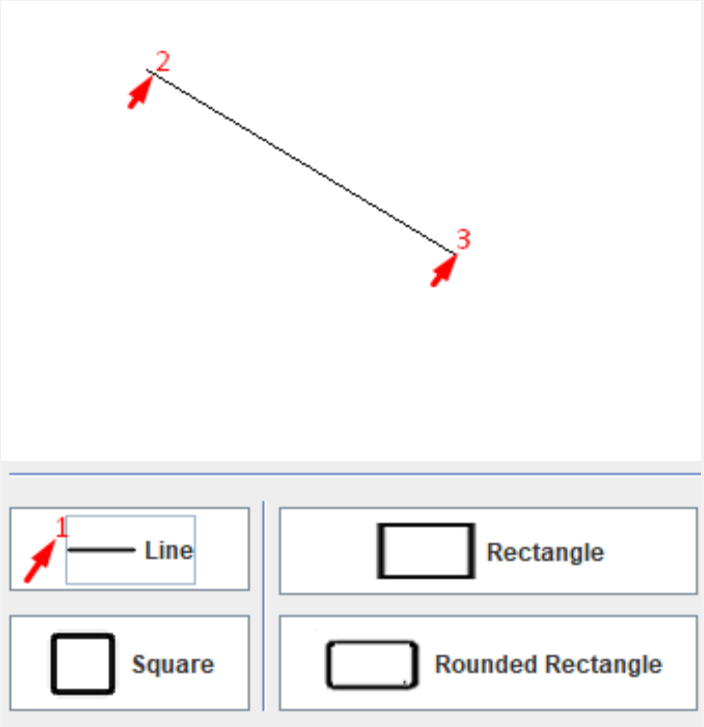


Figure 3.1

3.2 Filling the shapes:

1. We check the Fill box.
2. Choose the color of the shape.
3. Repeat steps in Section 3.1.

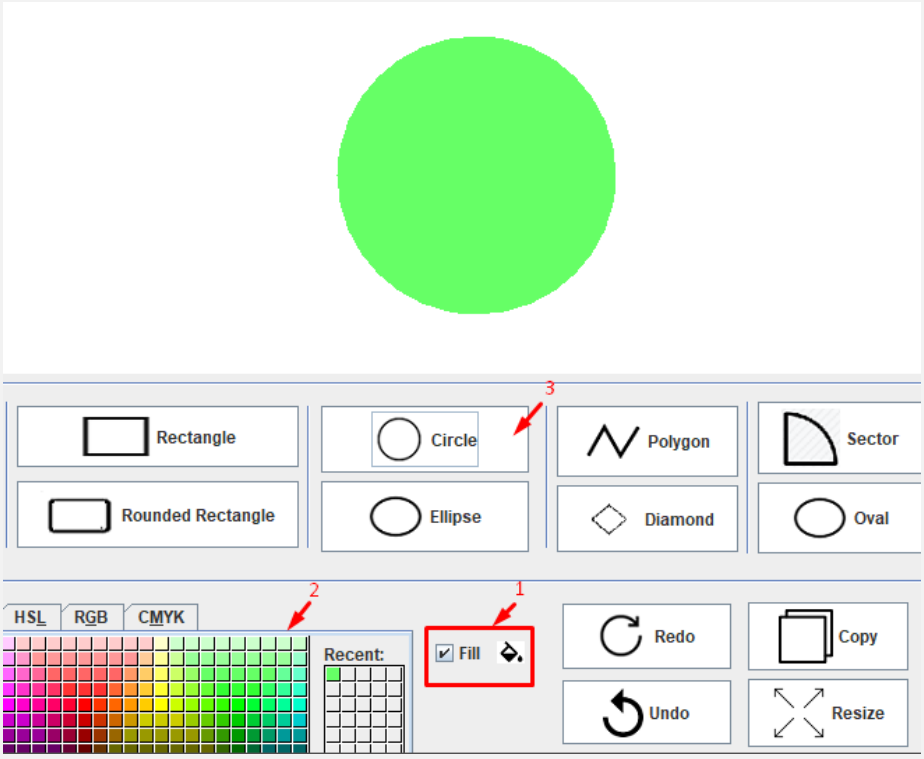


Figure 3.2

3.3 Undo and Redo

Suppose 3 shapes are drawn on the white board as shown in Figure 3.3.

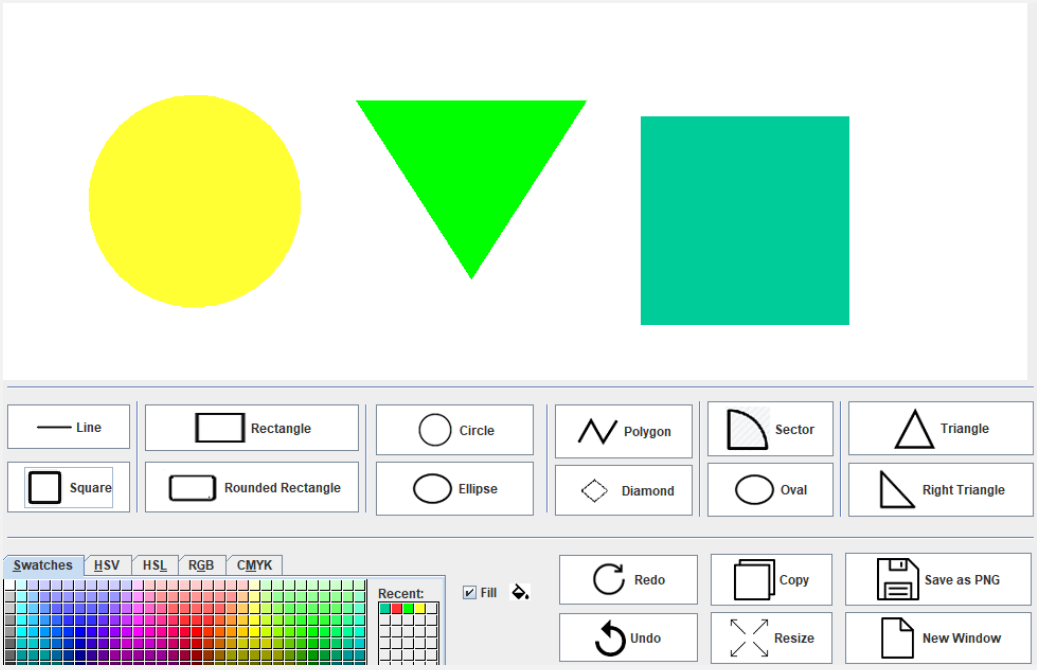


Figure 3.3

On clicking the Undo button, step backward is taken, and the last shape is deleted as shown in Figure 3.4.

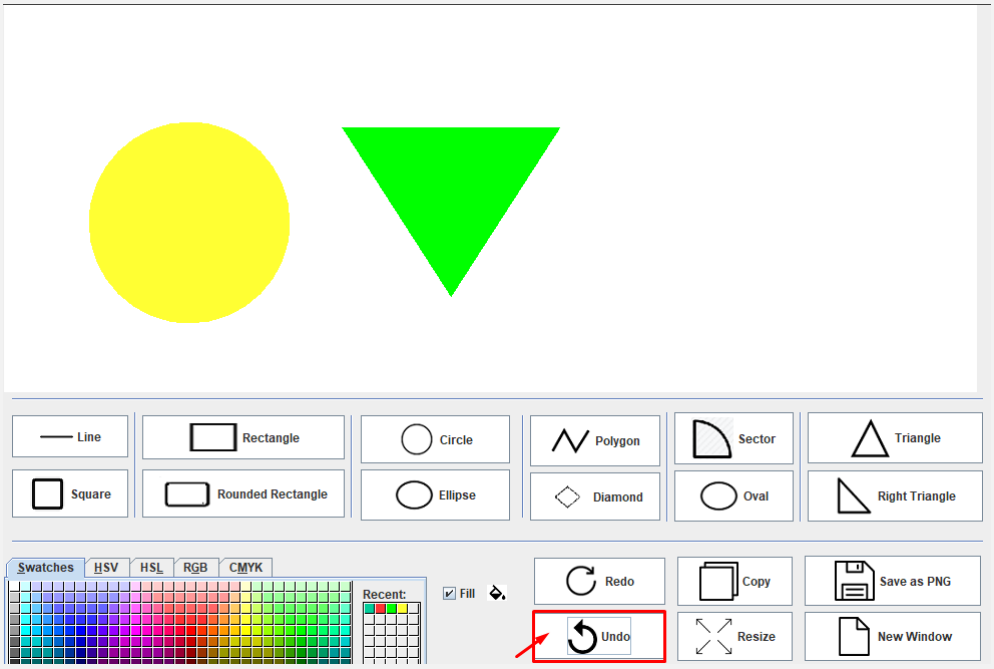


Figure 3.4

On clicking the redo button, the reverse of Undo, step forward is taken and the last shape deleted is retrieved again in the white board as shown in Figure 3.5.

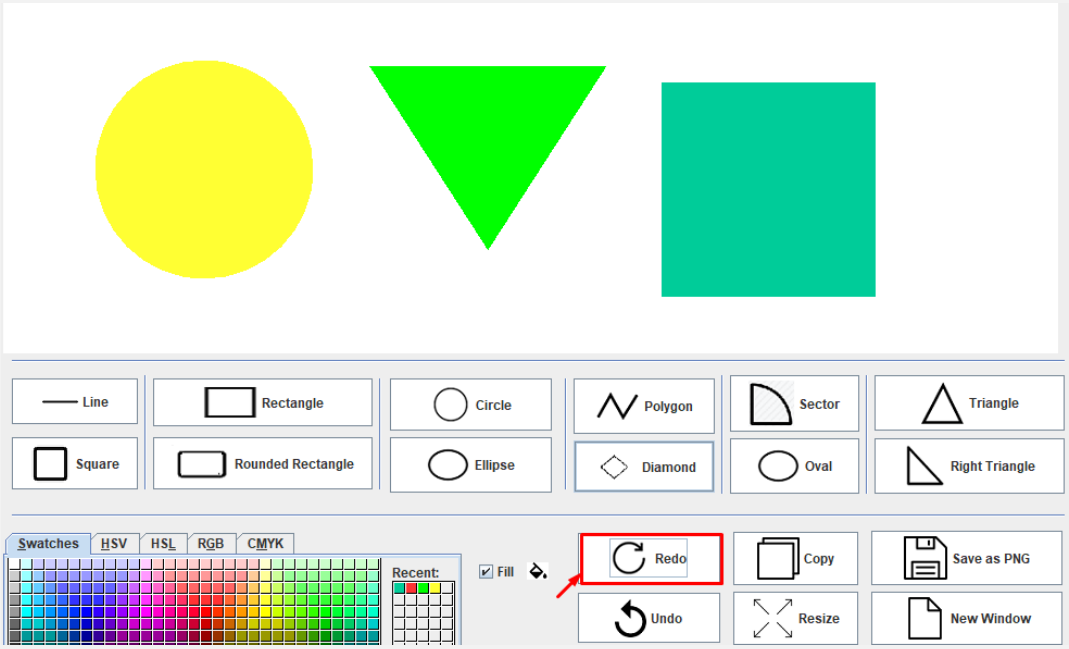


Figure 3.5

3.4 Delete

Suppose these shapes are drawn on the white board as shown in Figure 3.6.

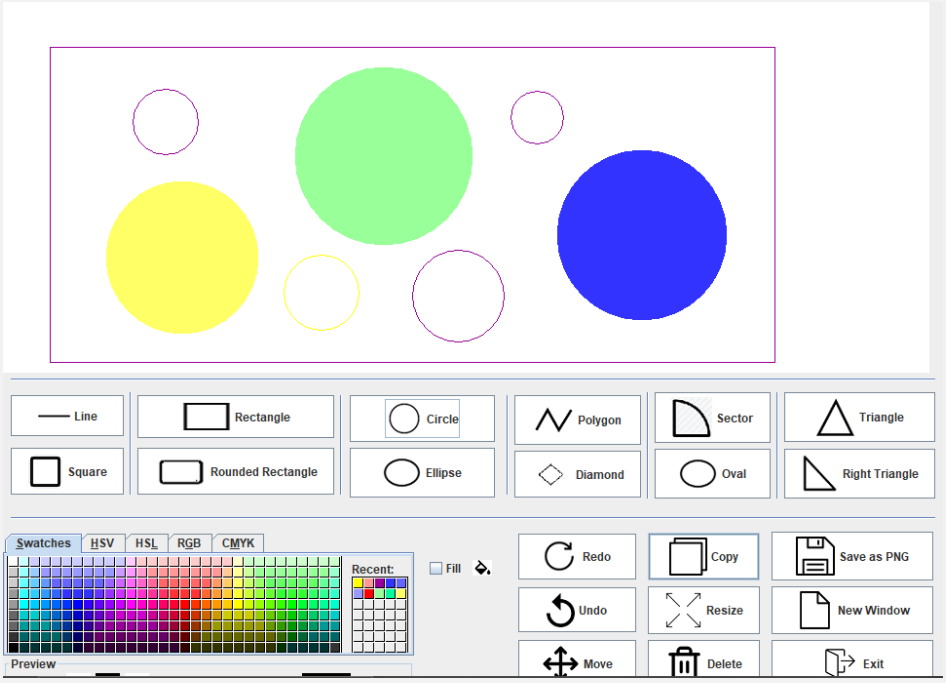


Figure 3.6

If we want to delete any shape from the white board, we simply click on the delete button and delete any shape by clicking on it as shown in Figure 3.7.

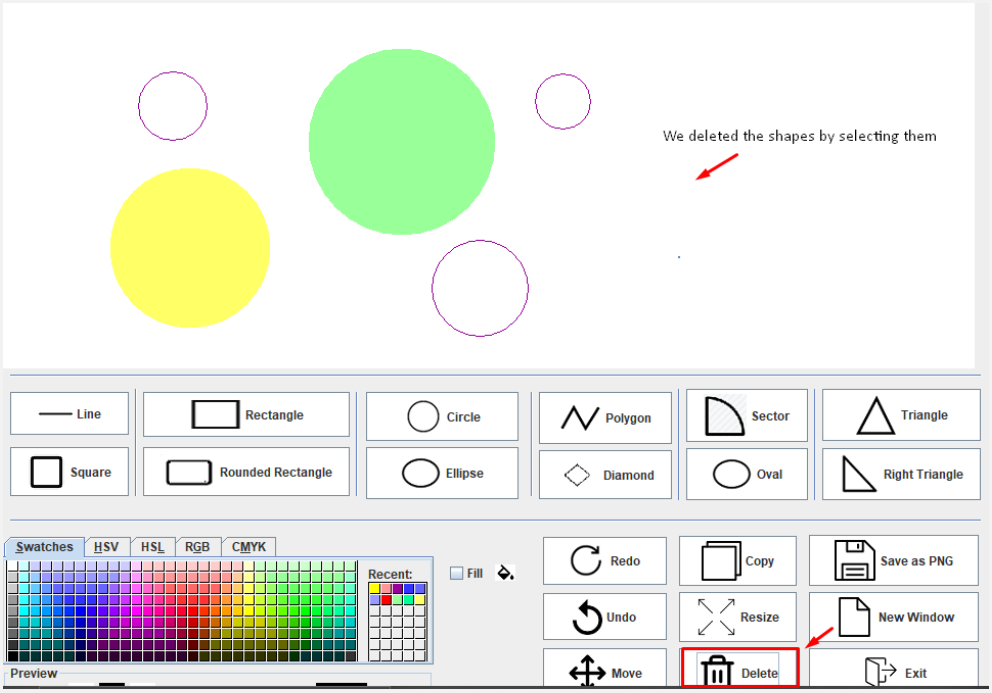


Figure 3.7

3.5 Saving

To save our work on the paint, we click on the Save As PNG button and the whiteboard is saved in the file of the project as shown in Figure 3.8.

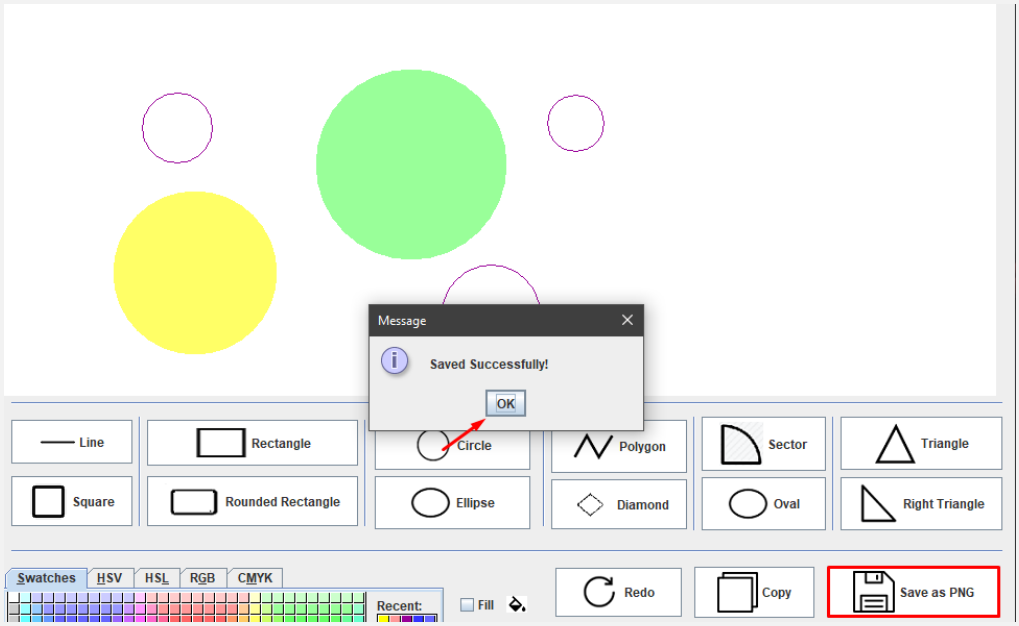


Figure 3.8

3.6 Moving

1. To move any shape.
2. Click on the move button.
3. Select the shape to be moved.
4. Drag it in the new position.

For example, the green circle is moved right as shown in Figure 3.9.

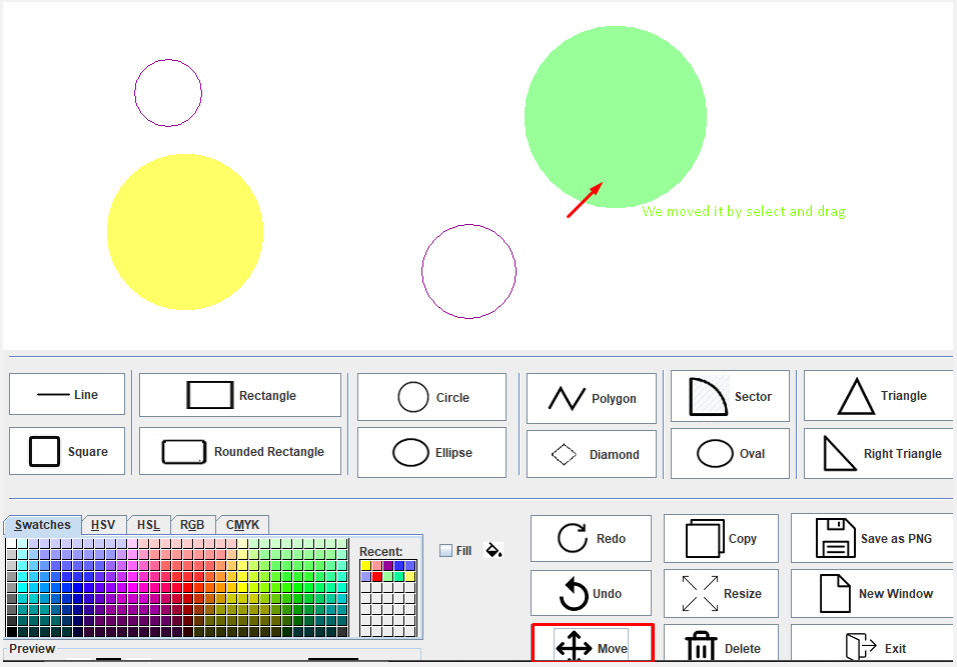


Figure 3.9

3.7 Resizing

To resize any shape: -

1. Select the resize button below.
2. Select the shape to be resized.
3. Drag it to determine the new size.

For example, the green circle is resized to be bigger as shown in Figure 3.10.

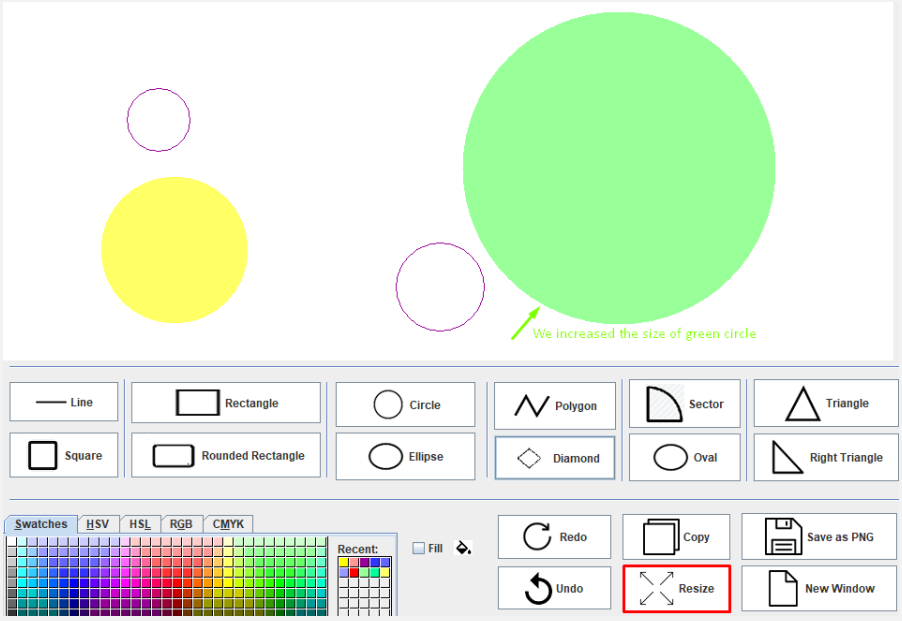


Figure 3.10

3.8 Exit

After finishing your work, you can exit the program by clicking on close button on the top right corner of the window or by simply clicking on the exit button shown in Figure 3.11.

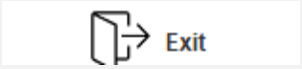
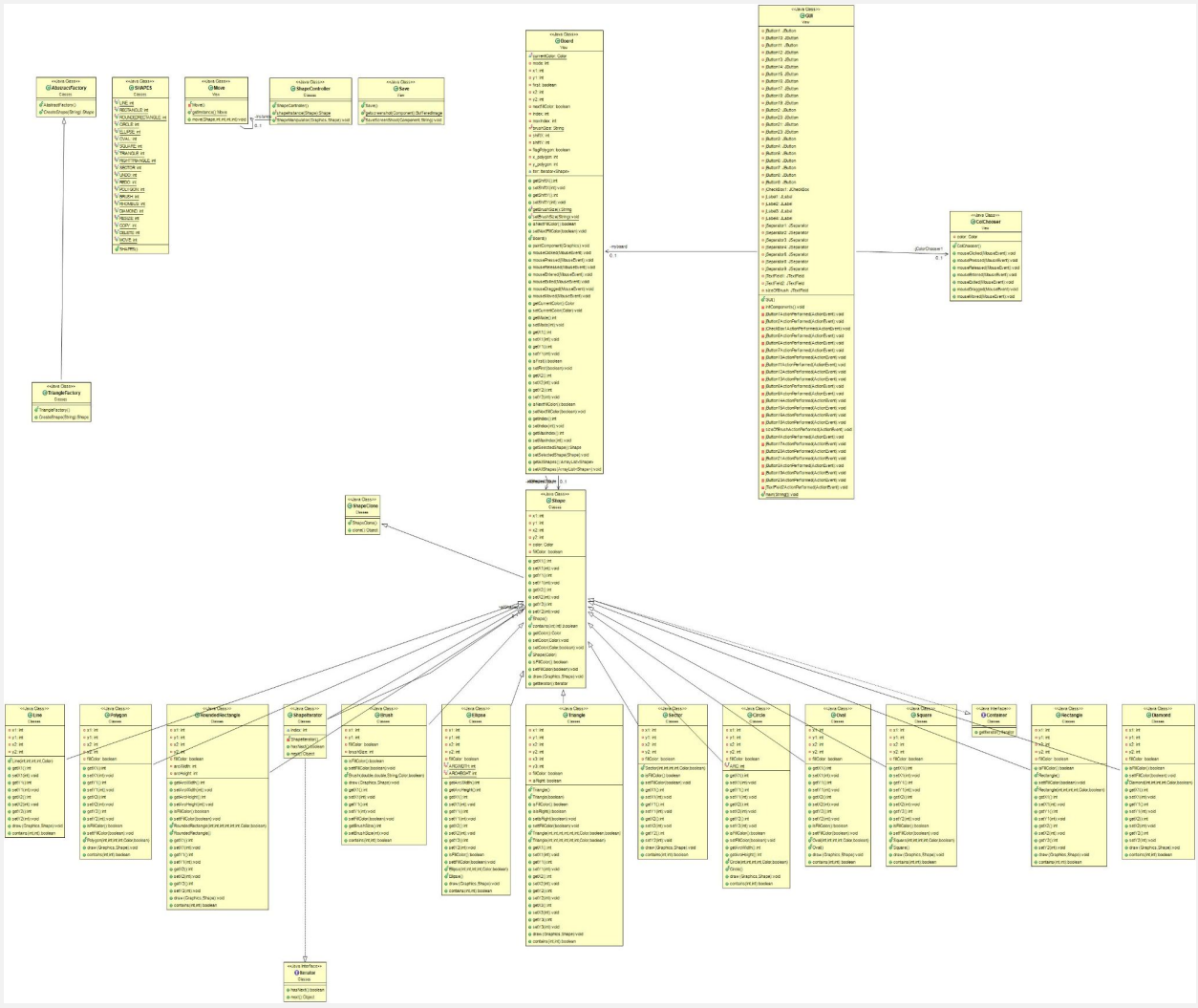
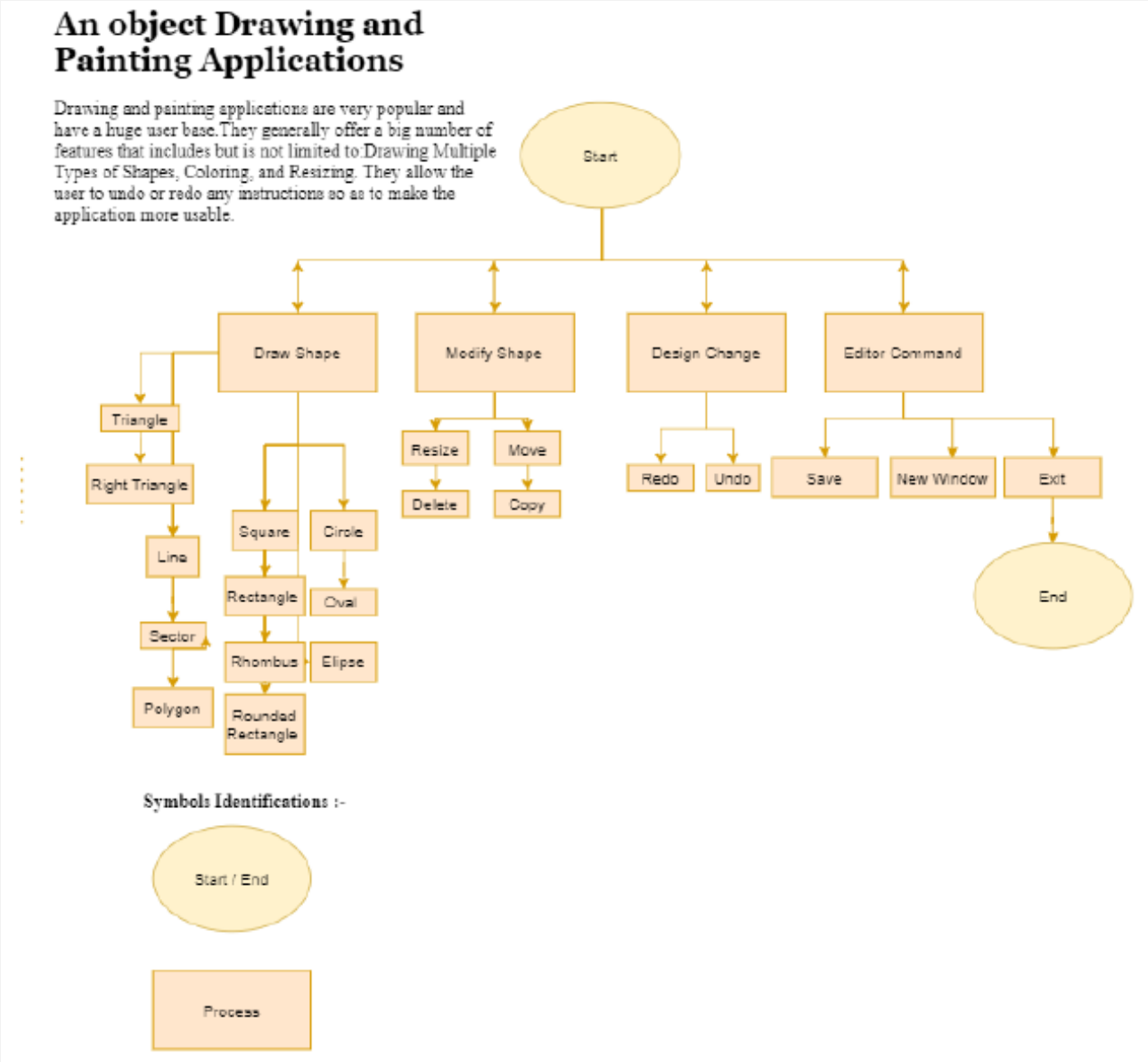


Figure 3.11

4. Class Diagram



5. Activity Diagram



6. Use Case Diagram