Web Based Drawing Program

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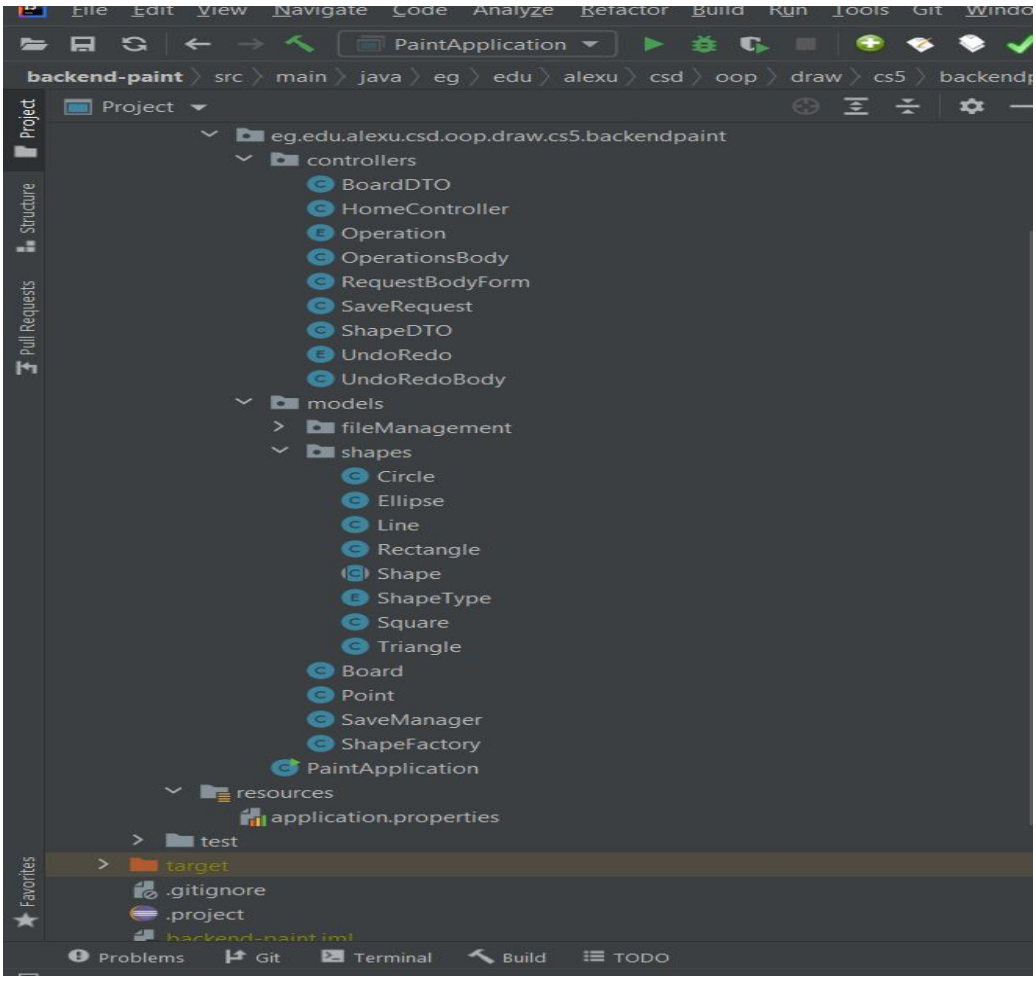
Description:

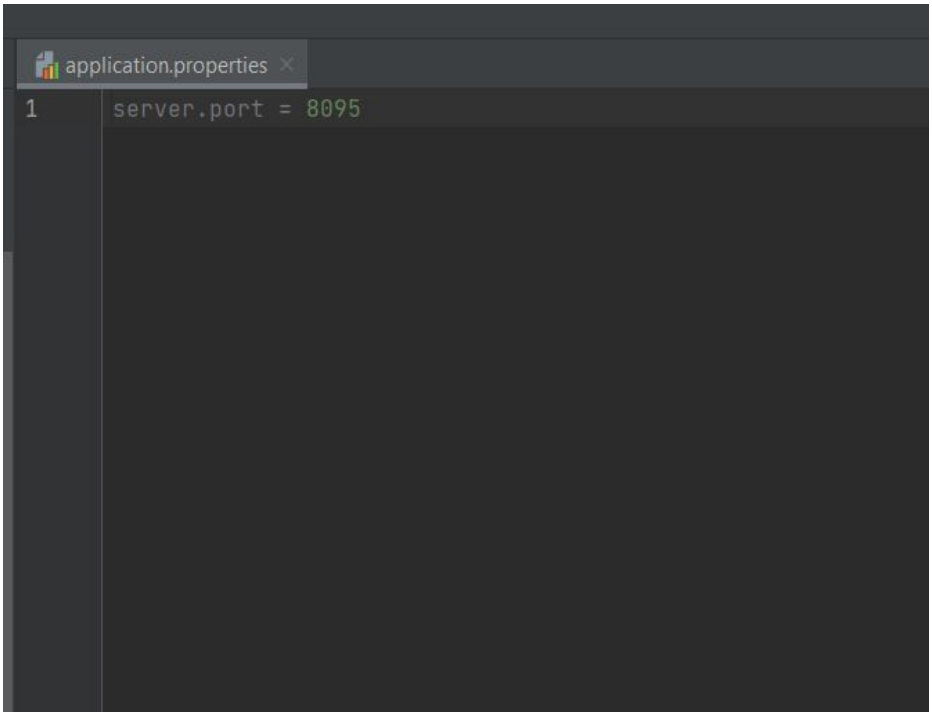
Drawing and painting applications are very popular and have a huge user base; they generally offer a big number of features that includes but is not limited to: Drawing, Coloring, and Resizing. They also include several built in, and possibly extensible set of geometric shapes, and classically, they allow the user to undo or redo any instructions to make the application more usable.

List of the steps required to run the code:

- **Import backend-paint folder to IDE (like intelliJ)**



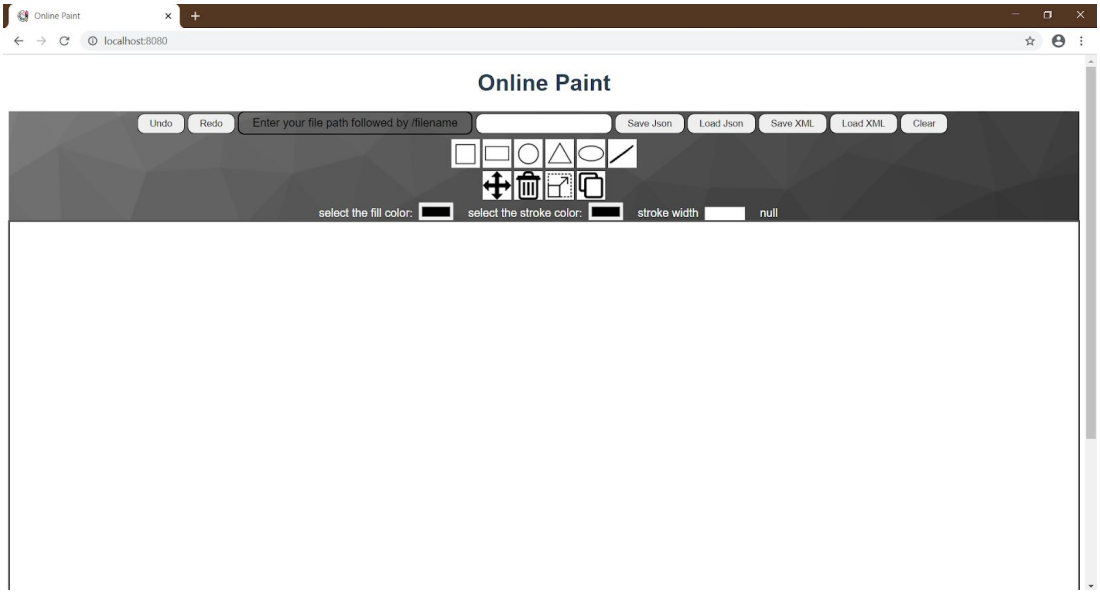
- **Run the backend**
- **It will run on server port 8095**



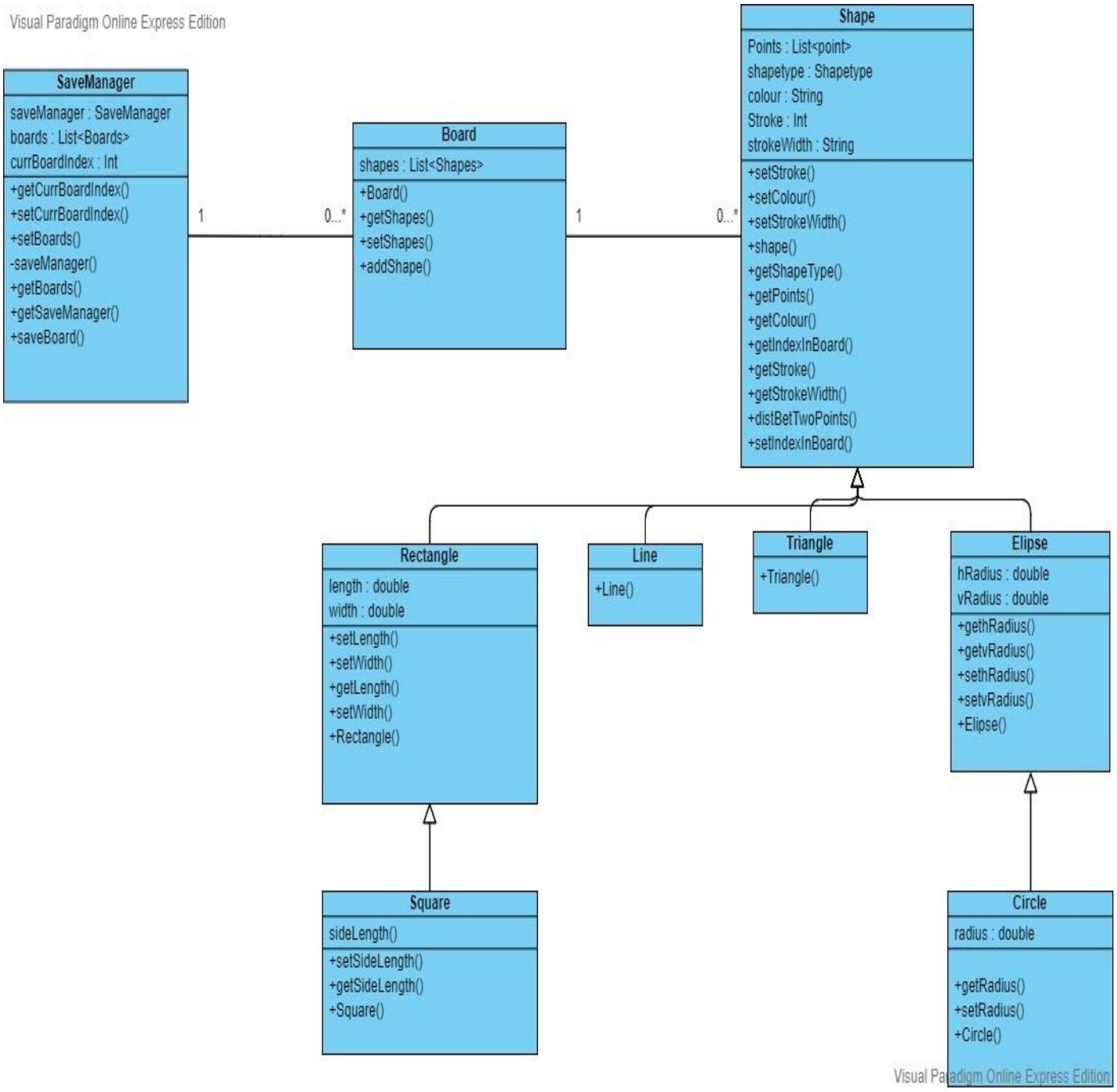
- **Import frontend-paint to visual studio code**
- **Write in terminal**

Yarn install

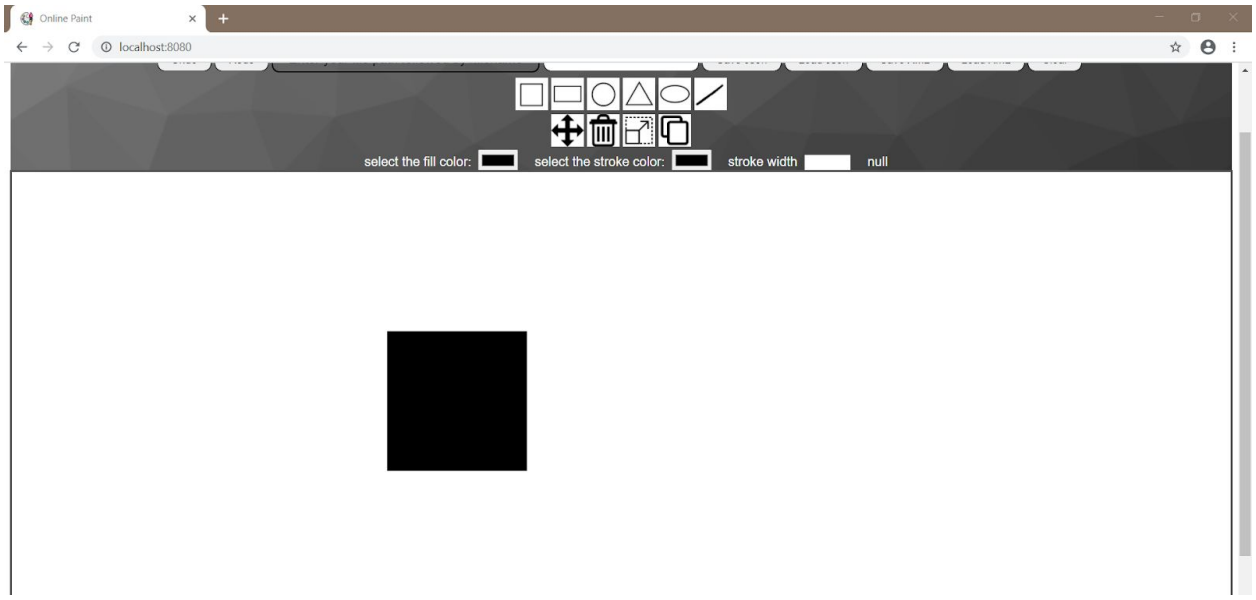
Yarn serve

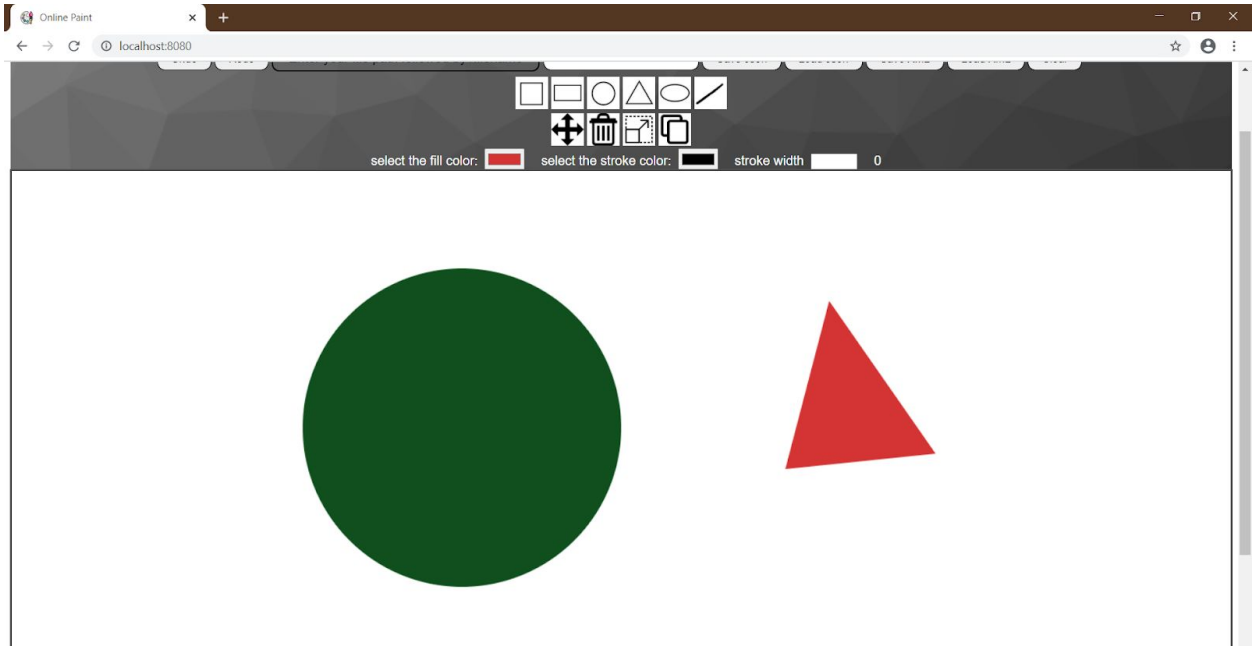


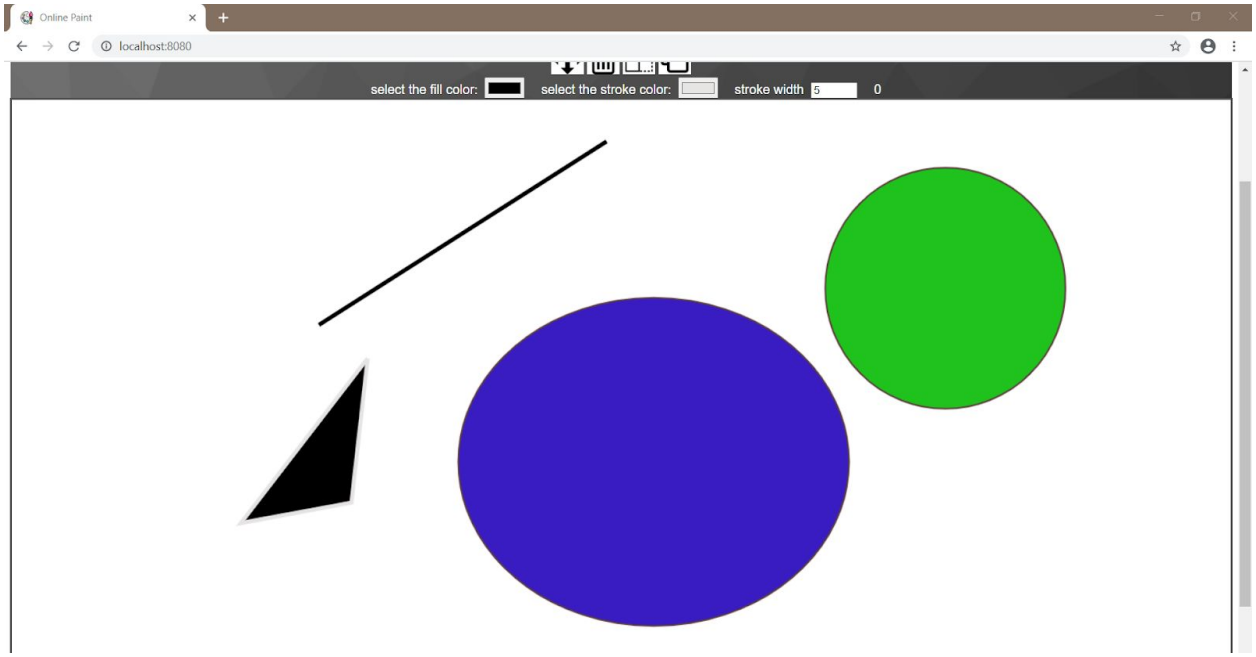
UML diagram


Visual Paradigm Online Express Edition
SaveManager
saveManager : SaveManager
boards : List<Boards>
currBoardIndex : Int
+getCurrBoardIndex()
+setCurrBoardIndex()
+setBoards()
-saveManager()
+getBoards()
+getSaveManager()
+saveBoard()
1
0...*
Board
shapes : List<Shapes>
+Board()
+getShapes()
+setShapes()
+addShape()
1
0...*
Shape
Points : List<point>
shapetype : Shapetype
colour : String
Stroke : Int
strokeWidth : String
+setStroke()
+setColour()
+setStrokeWidth()
+shape()
+getShapeType()
+getPoints()
+getColour()
+getIndexInBoard()
+getStroke()
+getStrokeWidth()
+distBetTwoPoints()
+setIndexInBoard()
Rectangle
length : double
width : double
+setLength()
+setWidth()
+getLength()
+setWidth()
+Rectangle()
Line
+Line()
Triangle
+Triangle()
Elipse
hRadius : double
vRadius : double
+gethRadius()
+getvRadius()
+sethRadius()
+setvRadius()
+Elipse()
Square
sideLength()
+setSideLength()
+getSideLength()
+Square()
Circle
radius : double
+getRadius()
+setRadius()
+Circle()
Visual Paradigm Online Express Edition

Screenshots of UI :





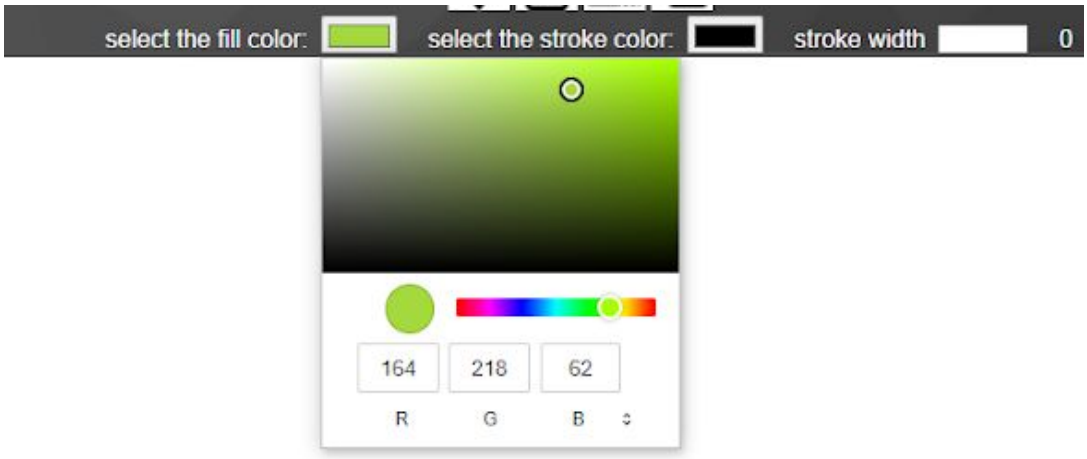


- **To draw shape**

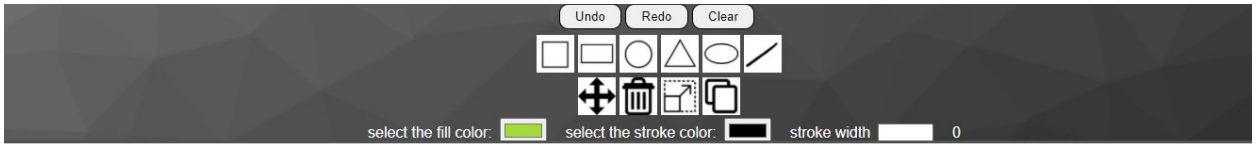
➢ Square: detect an origin point then another point and the side length will be the maximum difference between the origin coordinates and the second point coordinates.
➢ Rectangle: detect the origin point and its opposite point on the diagonal.
➢ Circle: detect center point and another point on the circumference.
➢ Triangle: detect the 3 vertices of the triangle.
➢ Ellipse: detect the center and 2 points on the circumference.
➢ Line: detect the 2 ends of the line.

After detecting any point a small dot appears to show the point until the shape is drawn then these small points will be removed.

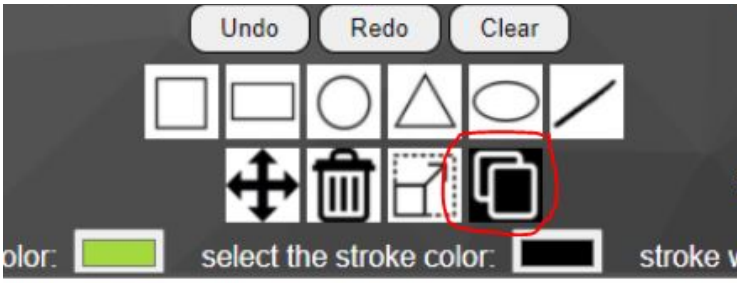
- **To fill the shape with color**
  - ➢ Select fill color before drawing



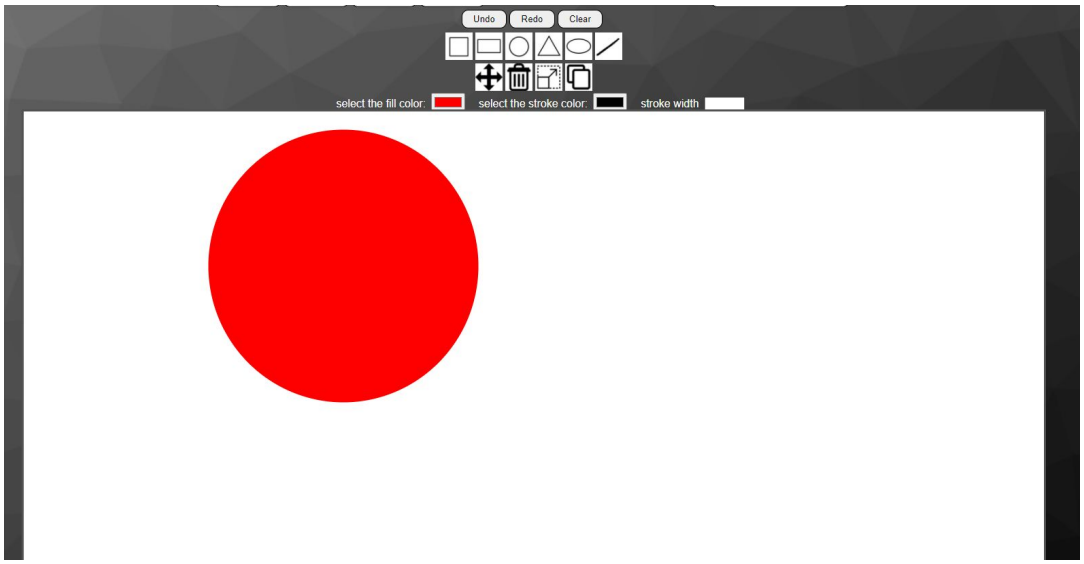
  - ➢ Then draw the shape

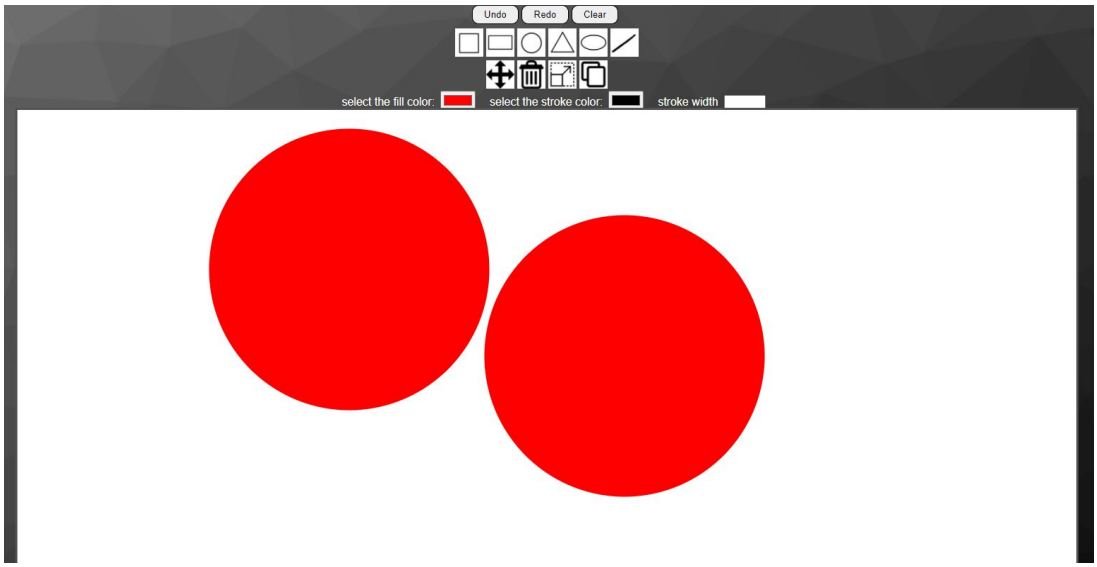


- **To copy shape**
  - ➢ Click the copy icon

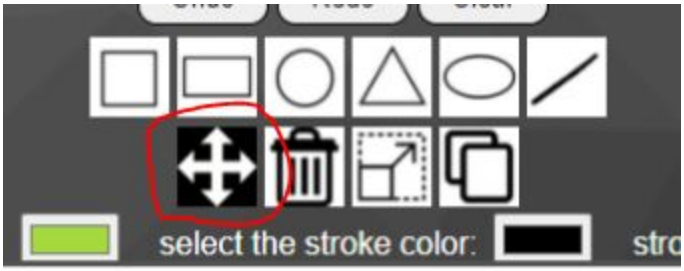


  - ➢ Then drag the shape you want to copy to the new place.

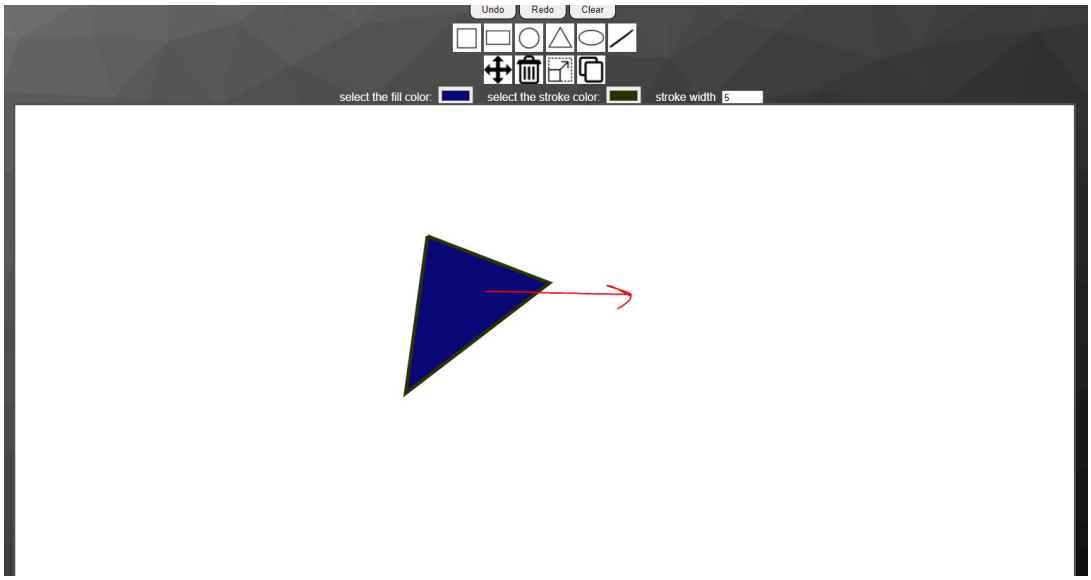


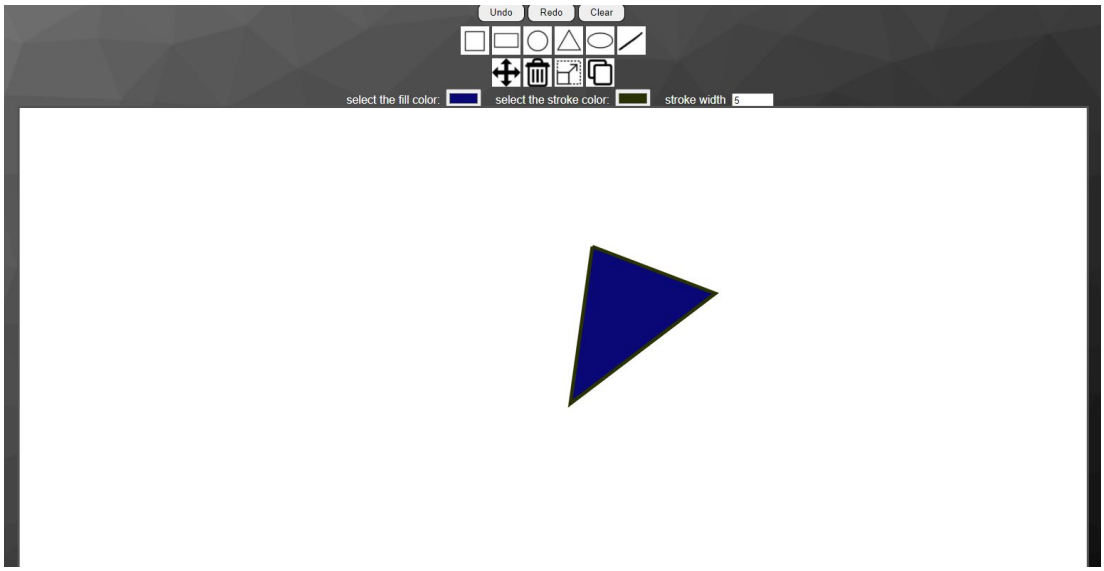


- **To move shape**
  - ➢ Click the move icon.



  - ➢ Then drag the shape you want to move to the new position.

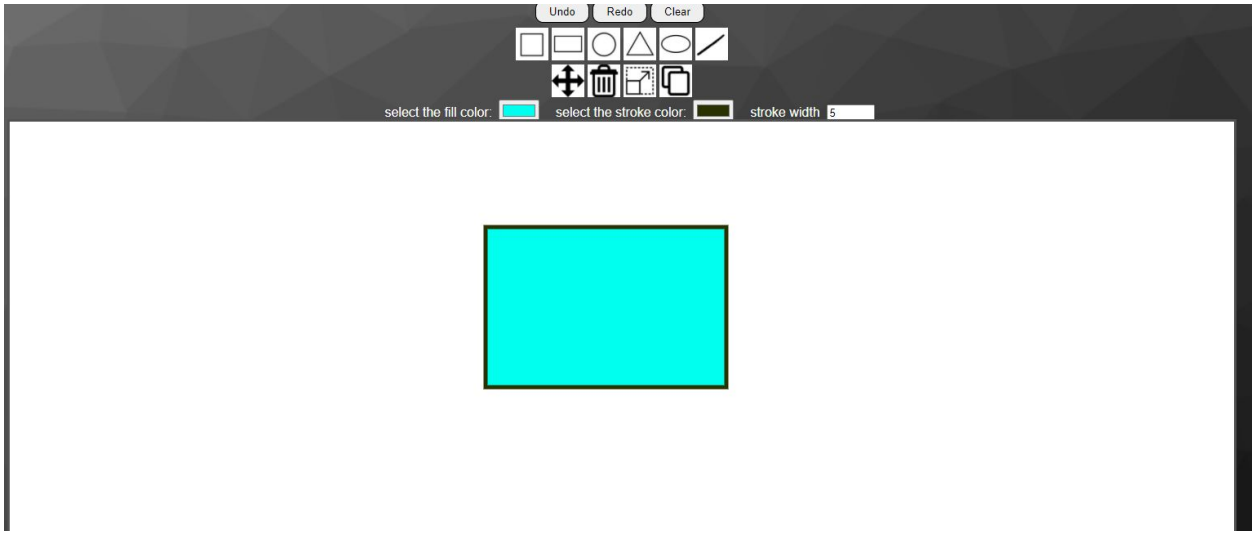




- **To delete shape**

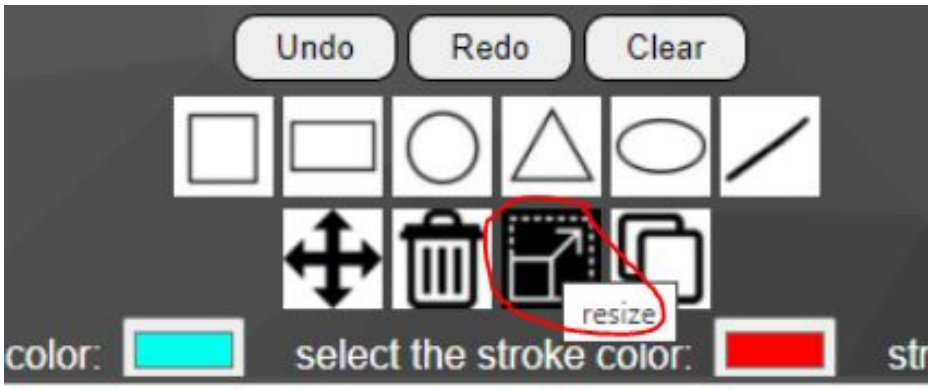
Click delete icon.

Then click the shape to delete it.



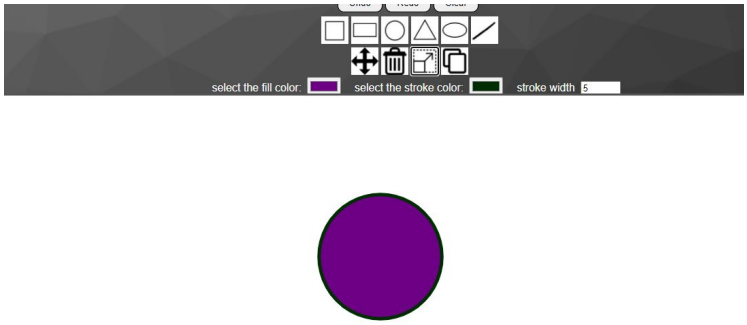
- **To resize shape**

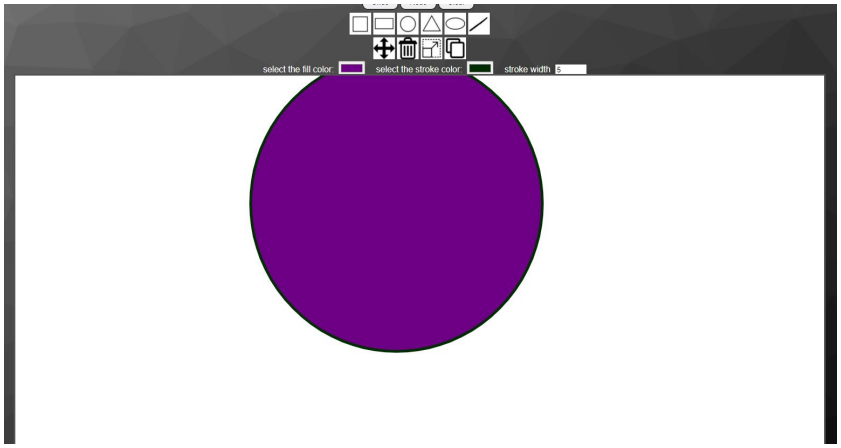
Click the resize icon.



Then enter the resize ratio.

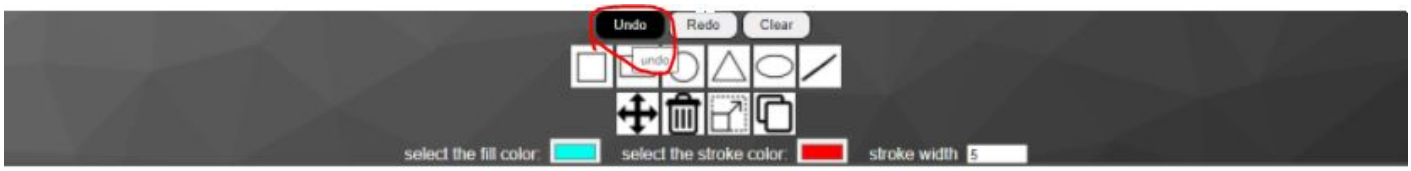
Then click the shape to resize it.

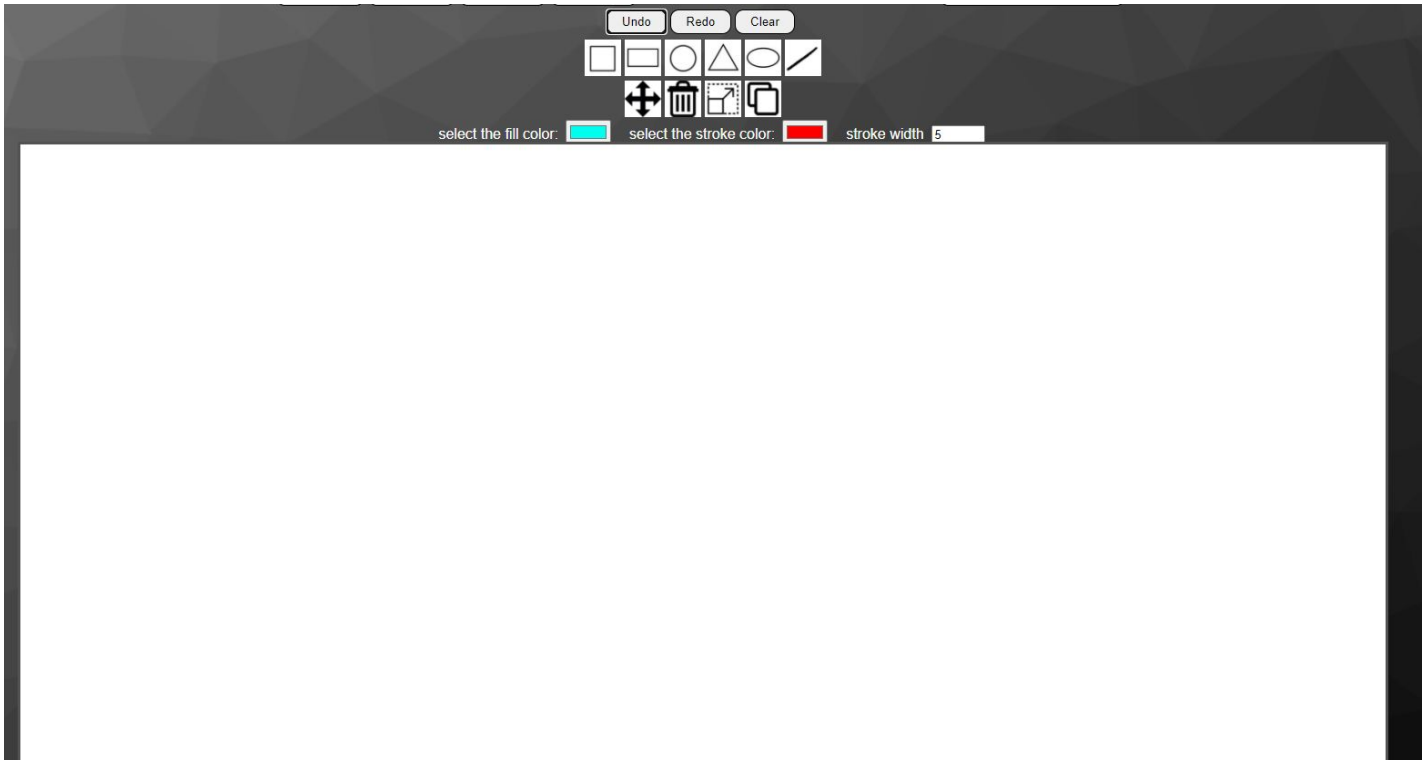




- **To Undo Operation**

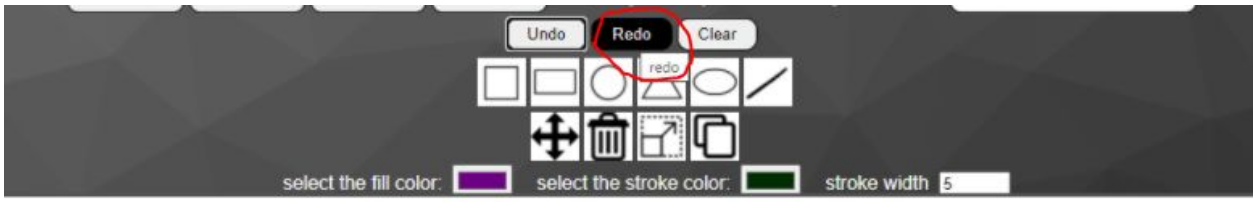
Click on the undo button.

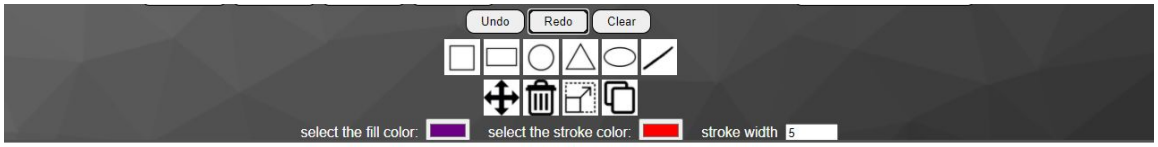


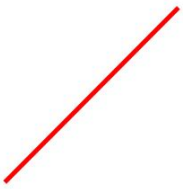


- **To Redo Operation**

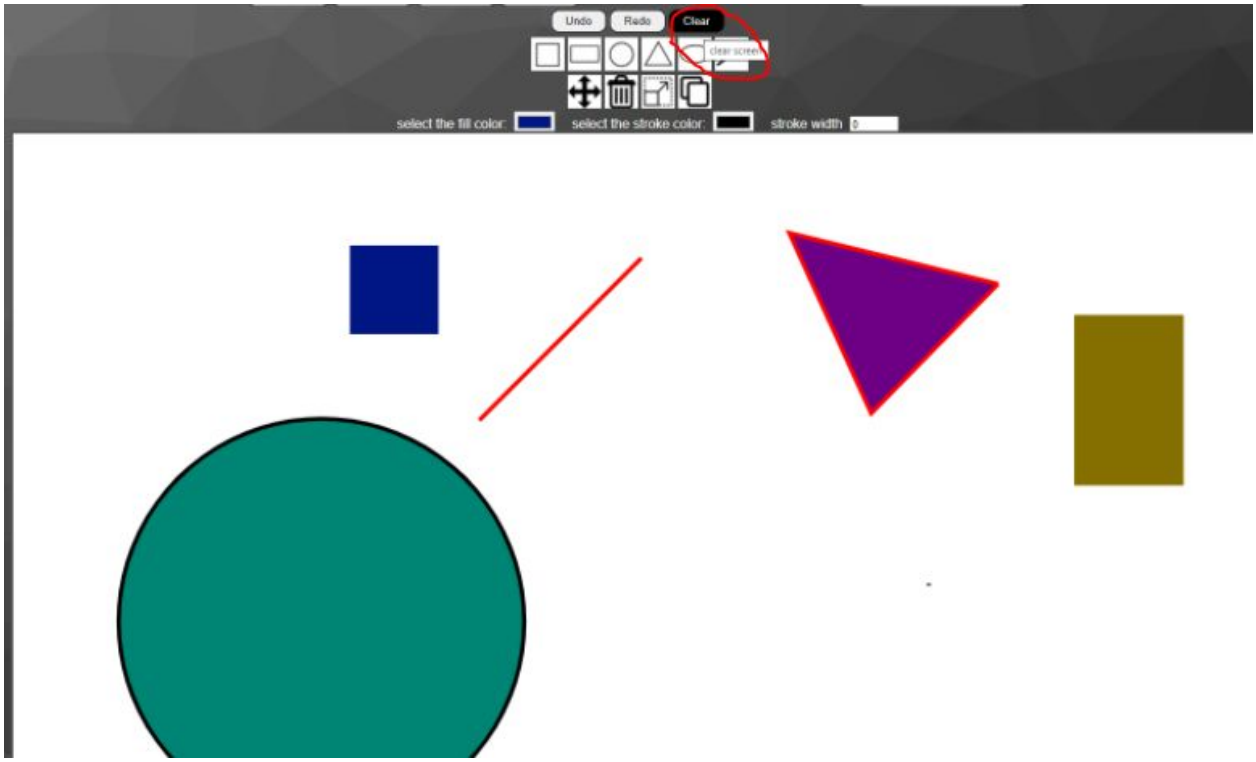
Click on the redo button.





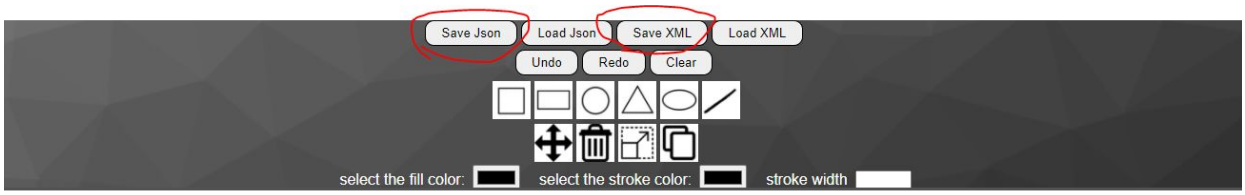


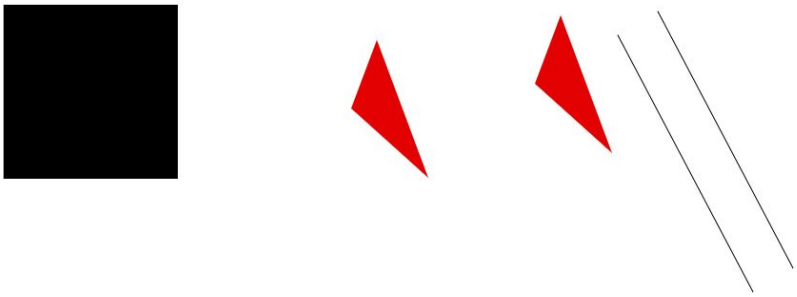
- **To Clear the board**
  - ➢ Click on the clear button



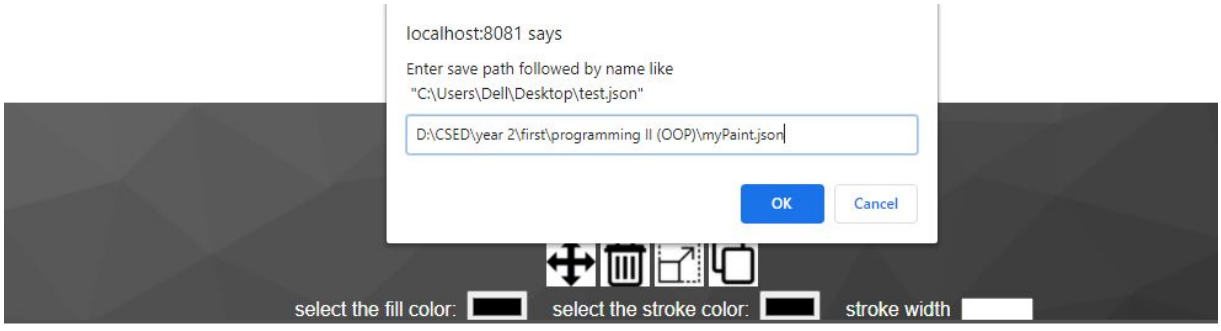
- **To save file**

Click the save button json or xml.





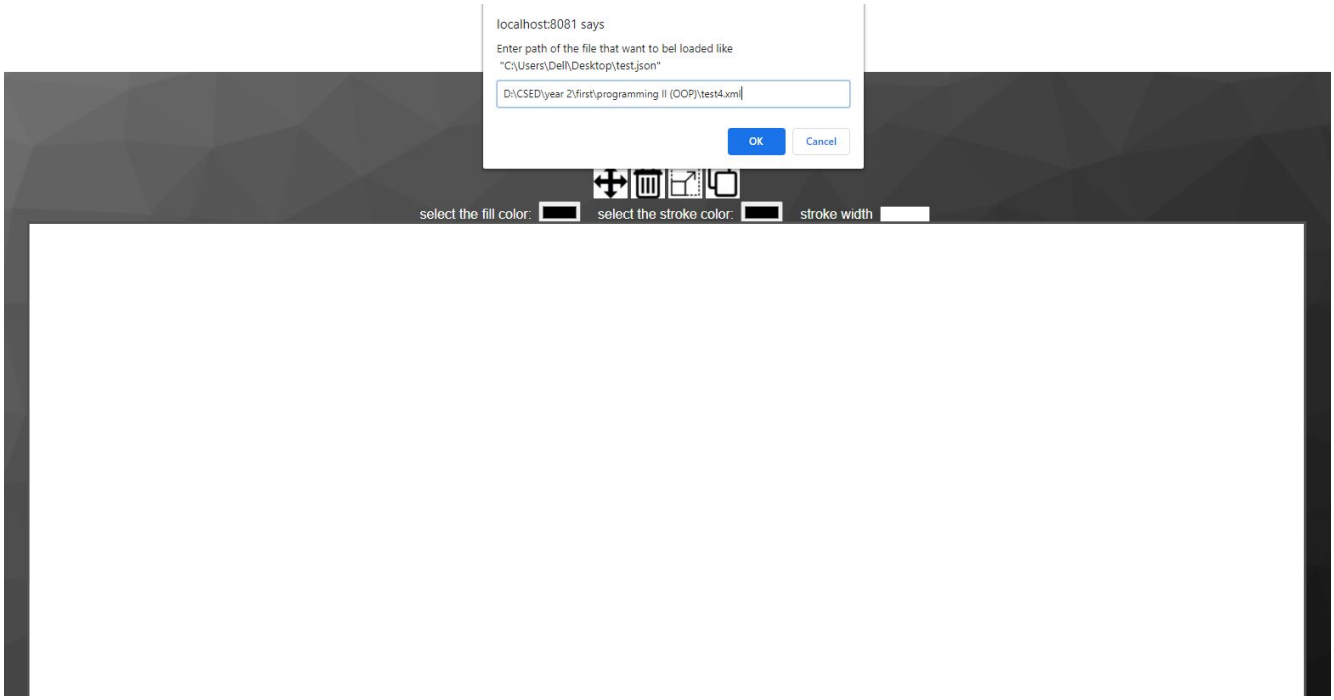
Then enter the file path followed by /"filename" , For example : C:\Users\Dell\Desktop\test.json

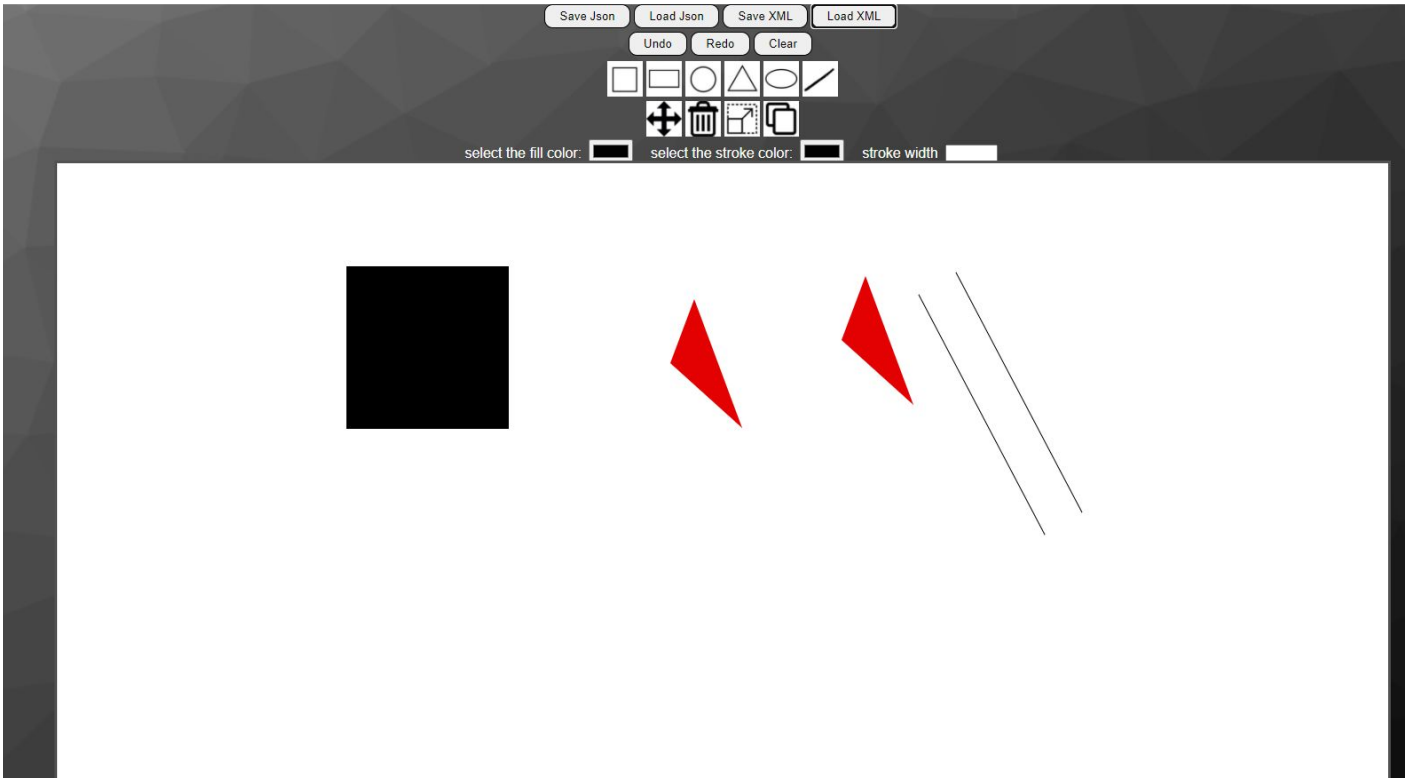


- **To load file**

Click the load button json or xml.

Then enter the file path followed by /"filename" , For example : C:\Users\Dell\Desktop\test.json




Save Json
Load Json
Save XML
Load XML
Undo
Redo
Clear
select the fill color:
select the stroke color:
stroke width

how applied the required design pattern in your code:

- **Singleton DP :**
  - ➢ SaveManager class

```
public class SaveManager {

    private static SaveManager saveManager;
    private static List<Board> boards;
    private int currBoardIndex;
    private int maxRedoIndex;

    public int getCurrBoardIndex() { return currBoardIndex; }

    public void setCurrBoardIndex(int currBoardIndex) { this.currBoardIndex = currBoardIndex; }

    public int getMaxRedoIndex() { return maxRedoIndex; }

    public void setBoards(List<Board> boards) { SaveManager.boards = boards; }

    private SaveManager() {
        boards = new ArrayList<>();
        currBoardIndex = -1;
    }
```

  - ➢ ShapeFactory class

```
import ...

public class ShapeFactory {

    private static ShapeFactory shapeFactory;

    private ShapeFactory() {

    }

    public static ShapeFactory getShapeFactory() {
        if (shapeFactory == null) {
            shapeFactory = new ShapeFactory();
        }
        return shapeFactory;
    }
```

- **Factory DP :**
  - ➢ ShapeFactory class

```java
import ...

public class ShapeFactory {

    private static ShapeFactory shapeFactory;

    private ShapeFactory() {

    }

    public static ShapeFactory getShapeFactory() {
        if (shapeFactory == null) {
            shapeFactory = new ShapeFactory();
        }
        return shapeFactory;
    }
```

```java
public Shape createShape(ShapeType shapeType, List<Point> vertices) {
    switch (shapeType) {
        case LINE:
            return new Line(vertices, shapeType);
        case CIRCLE:
            return new Circle(vertices, shapeType);
        case SQUARE:
            return new Square(vertices, shapeType);
        case ELLIPSE:
            return new Ellipse(vertices, shapeType);
        case TRIANGLE:
            return new Triangle(vertices, shapeType);
        case RECTANGLE:
            return new Rectangle(vertices, shapeType);
    }
    return null;
}
```

Some notes:

- The resize function may contain some bugs and unfortunately for lack of time we didn't fix it.. So if you try it and some bad scenarios happen the error is in the resize function only.
- We hope to earn some bonus points for the drawing with stroke , change its width and its color ,, the friendly interface and button styles.