******** REPORT ********

. MOHANNAD ASHRAF 4590
. AHMED HATEM 4593

DESCRIPTION:

An application that allows the user to simulate painting on the computer by using the mouse.

The images are generated as "bitmapped graphics," which are a matrix of picture elements (pixels).

You can draw multiple of shapes by choosing the desired shape from the panel shown to user.

Paint application allows the user to colour shapes, resize, move, or copy shapes.

You can save your work in any place you like on your computer.

FEATURES OF THE APP:

You can do multiple of things with this application, you can draw any shape you like by choosing the desired one from the panel shown.

You can draw the desired shape in any size you prefer, simply by releasing your hand from the mouse at the desired place using mouse dragging.

You can edit your work , change colour, move, copy, delete or resize your work.

You are allowed to save your work at any folder you like.

OVERVIEW:

The design follows the MVC architecture model represents an object, view represents the visualization of the data that model contain and Controller acts on both model and view. It controls the data flow into model object and updates the view whenever data changes and keeps view and model separate.

MODEL:

The model contains one main interface named Shape which is implemented by six different shapes (Circle,Rectangle,Square,Triangle,Line,Ellipse) each one implement its own color, properties and position.

VIEW:

The view contains one frame and three different panels : first panel contains the menu, second contains drawing buttons and the third contains the drawing canvas.

CONTROLLER:

Controller contains one main interface (Drawing Engine) and implemented by abstract class (Control) to save common variables for the children .

Control is implemented by : (Command Edit) for undo and redo options , (FActions) : for main actions like: move ,draw, copy, resize, color , delete , implemented each action in class and called using Factory dp , (SaveXml) and (SaveJson) for saving to json file or xml file and called using class (Strategy context) .

Undo and Redo feature is done using Memento design pattern using three main classes (Memento,MementoCareTaker,MementoOriginator) where mementoCarTaker is used to save the previous state of the shape into arrayList . And Memento Originator used to set the state to the memento.

Factory class is only used return the action used in the program ex : FActions of type move.

Second interface in controller is the Command interface having one function name execute() implemented by 2 classes (CommandUndo) and (CommandRedo) to call either undo function or redo function in (CommandEdit) class.

REFERENCES:

We used some help from Stack and Flow in the algorithms of

Save & Load functions

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DIVISION OF WORK:

Mohannad Ashraf - 4590 :

==> Designing and modeling shapes ,saving and loading to json and xml ,implementing singleton and strategy dp , report part 1

Ahmed Hatem - 4593 :

==> Implementing all actions and editing shapes ,undo and redo, implementing factory,command and memento dp. , report part 2

ASSUMPTION:

- Draw shape by mouse dragging • Edit size of the shape
- Change Color of the shape
- Delete shape
- Undo and Redo using Memento • Save shapes

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DATA STRUCTURE USED:

- **Array List** to save shapes
- **Array List** to save memento
- **Stack** to undo and redo

IMPORTANT FUNTIONS USED:

Select(MouseEvent) : takes mouse event as an argument and searches in the arrayList of shapes to check if the contains the mouse point.

Move(MouseEvent) : after selecting the shape from the arrayList move sets the shape to mouse at its center and moves with mouse until releasing mouse

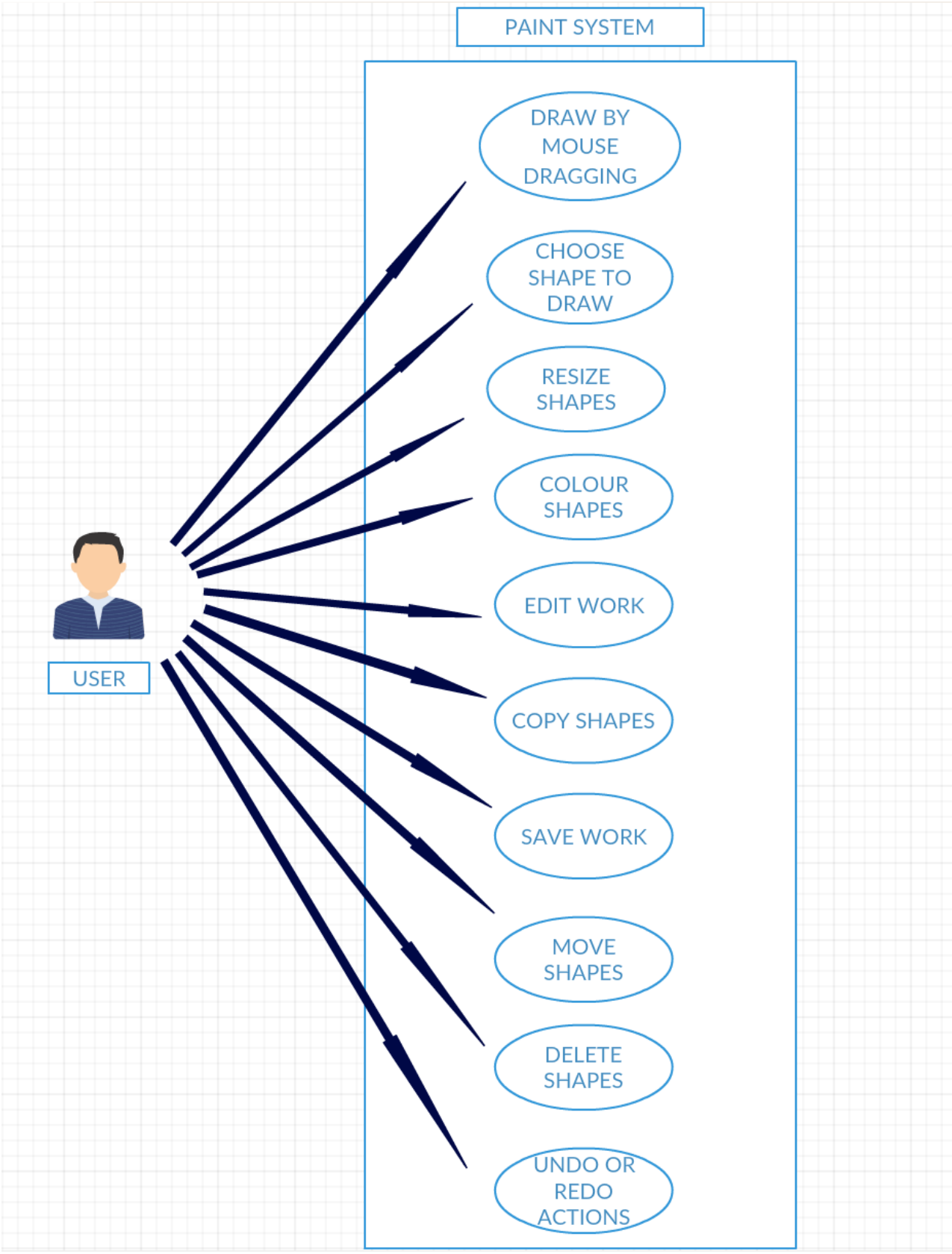
Copy(MouseEvent) : select the object and then calls function clone to make a hard copy for the shape.

Refresh(Graphics) : redraw all shapes in the arrayList on the canvas.

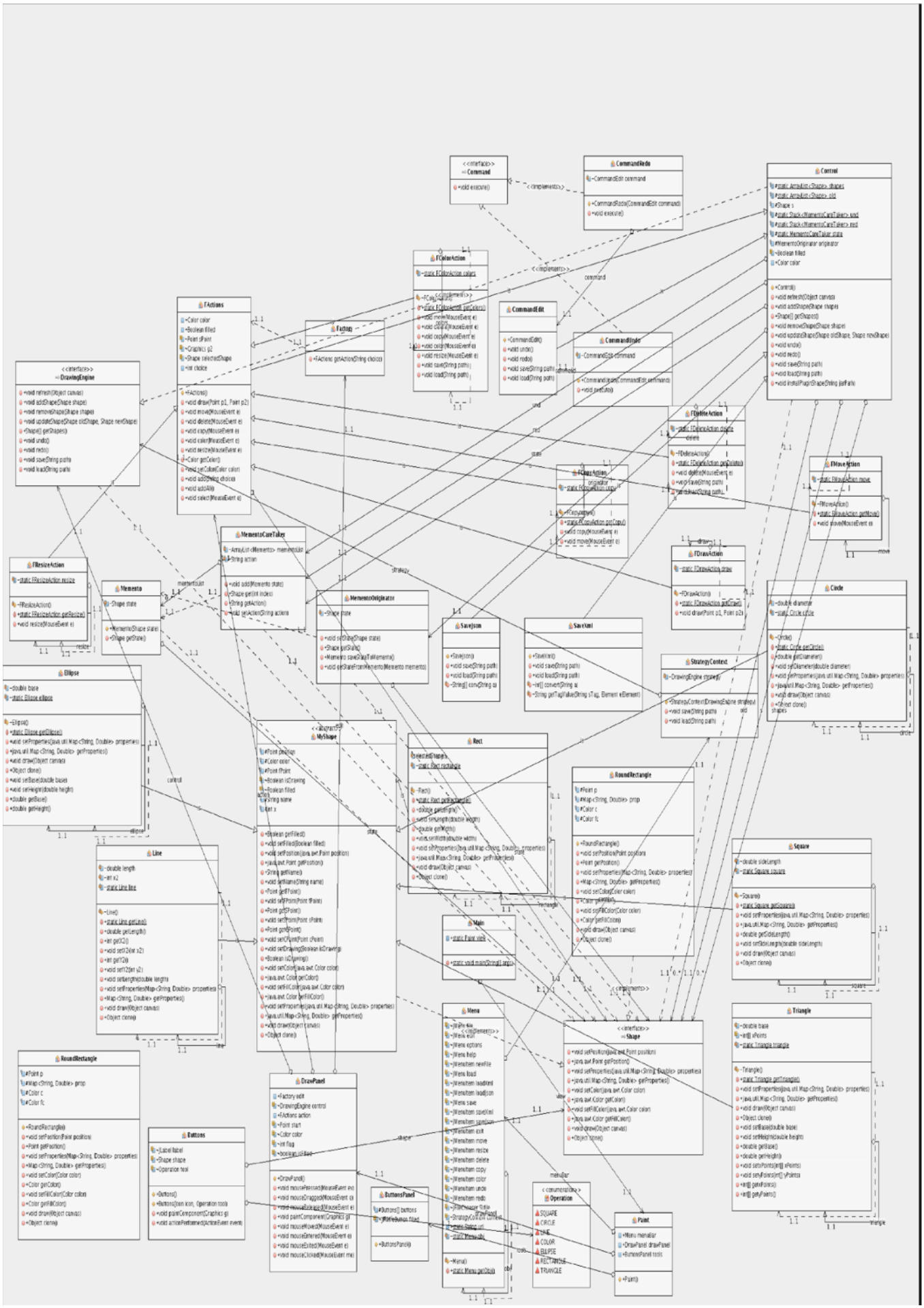
Remove(Shape shape) : searches for the shape in arrayList and remove it.

Resize (MouseEvent) : sets the properties of everyShape according to difference between position and mouse position.

USE CASE:


PAINT SYSTEM
DRAW BY MOUSE DRAGGING
CHOOSE SHAPE TO DRAW
RESIZE SHAPES
COLOUR SHAPES
EDIT WORK
COPY SHAPES
SAVE WORK
MOVE SHAPES
DELETE SHAPES
UNDO OR REDO ACTIONS
USER

CLASS DIAGRAM:



SOME SCENARIOS:

- Drawing a **CIRCLE**

1- Go to Edit

2- Select colour

3- Go to the “Colour Palette” and choose your desired colour

4- Select either “Filled” or “Hollow”

5- Go to the Circle shape , and press on it

6- Start drawing by dragging the mouse from your desired place

7- Release your hand from the mouse when you finish

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- Editing an **ELLIPSE (move)**

1- Go to Edit

2- Select move

3- Go to the Ellipse shape , and press on it

4- Start moving by dragging the mouse from your desired place

5- Release your hand from the mouse when you finish

- Saving a shape using **JSON** file

1- Go to File

2- Select “save as”

3- Select “JSON file”

4- Choose the folder where you wish to save in

5- Click on save

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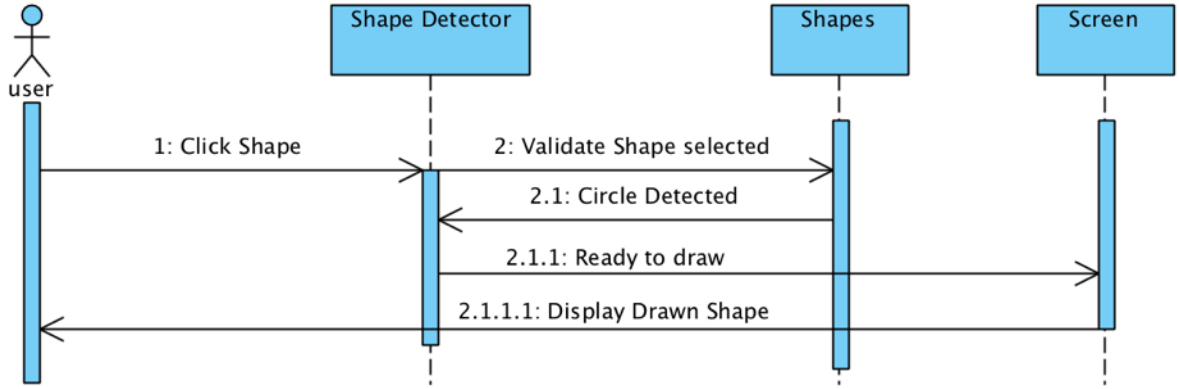
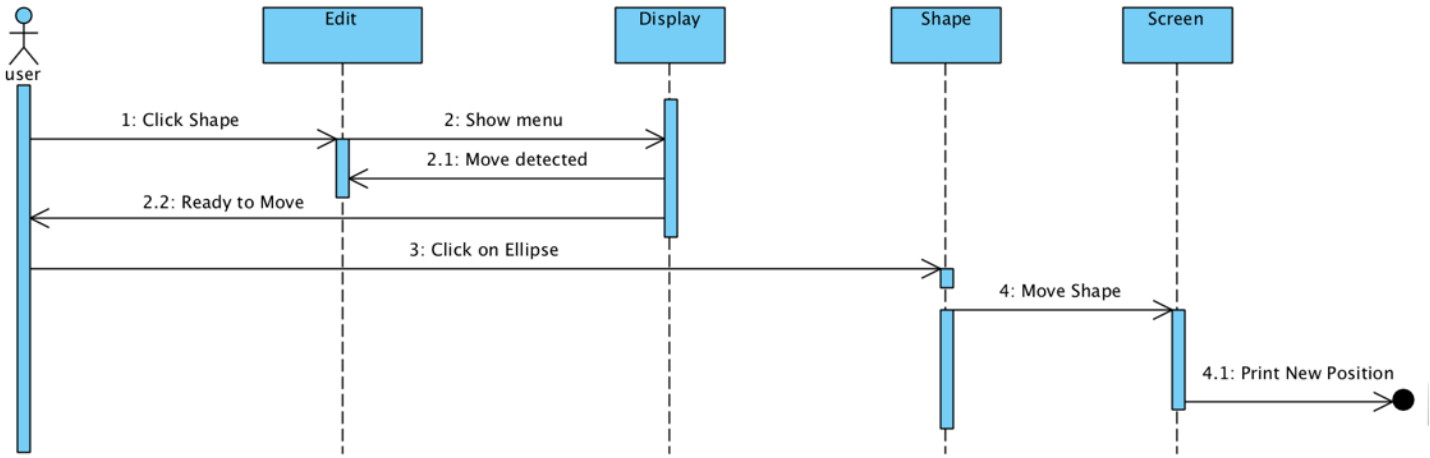
SEQUENCE DIAGRAMS:

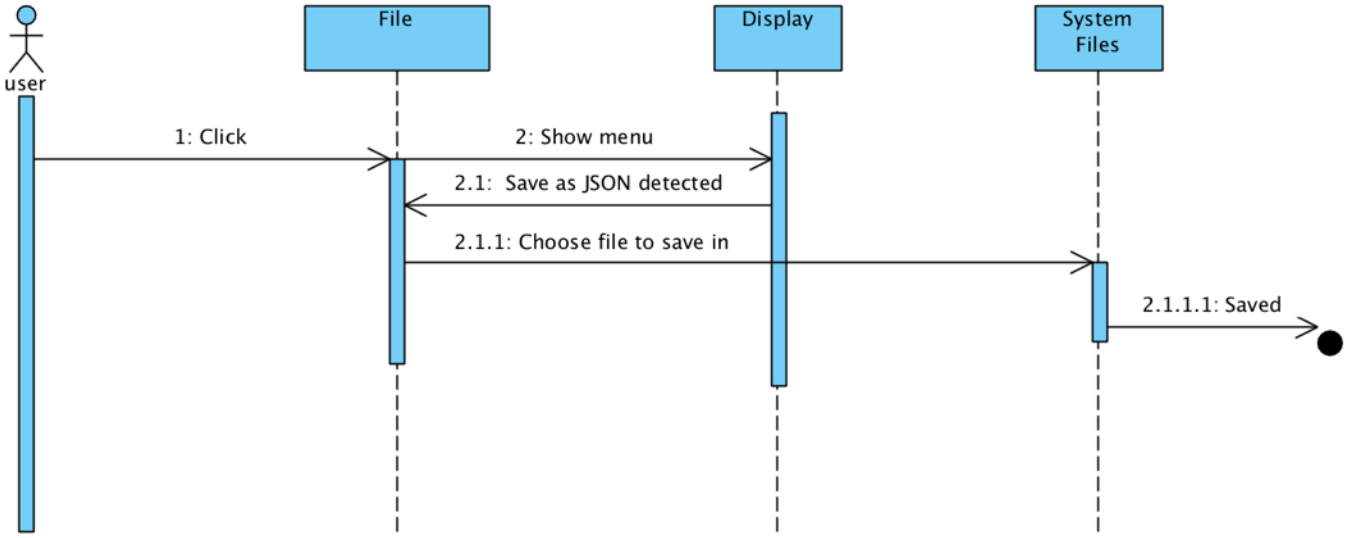
Drawing a **CIRCLE:**



Editing an **ELLIPSE (Move):**



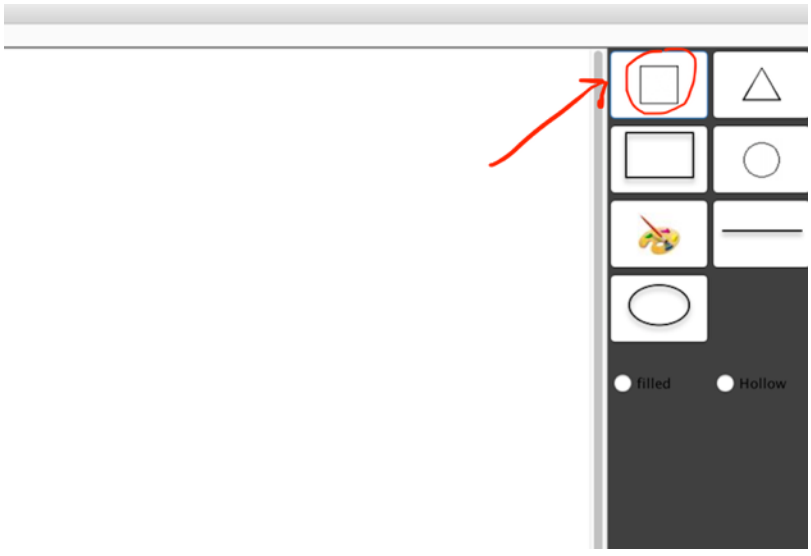
Saving a shape using **JSON** file:



USER MANUAL

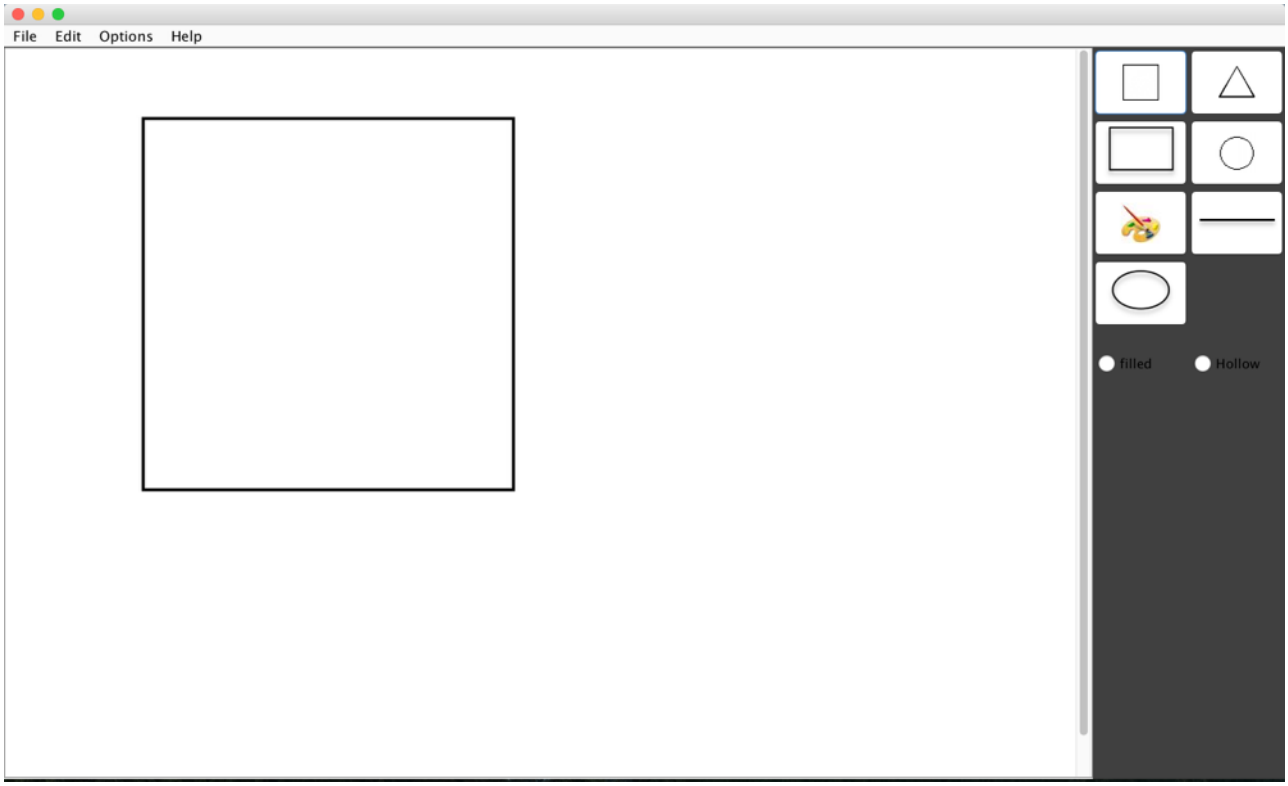
First of all when you open up the application, the following screen will appear:

Now you can start using the paint application , you can choose any shape you prefer from the panel shown on the right side of the application:

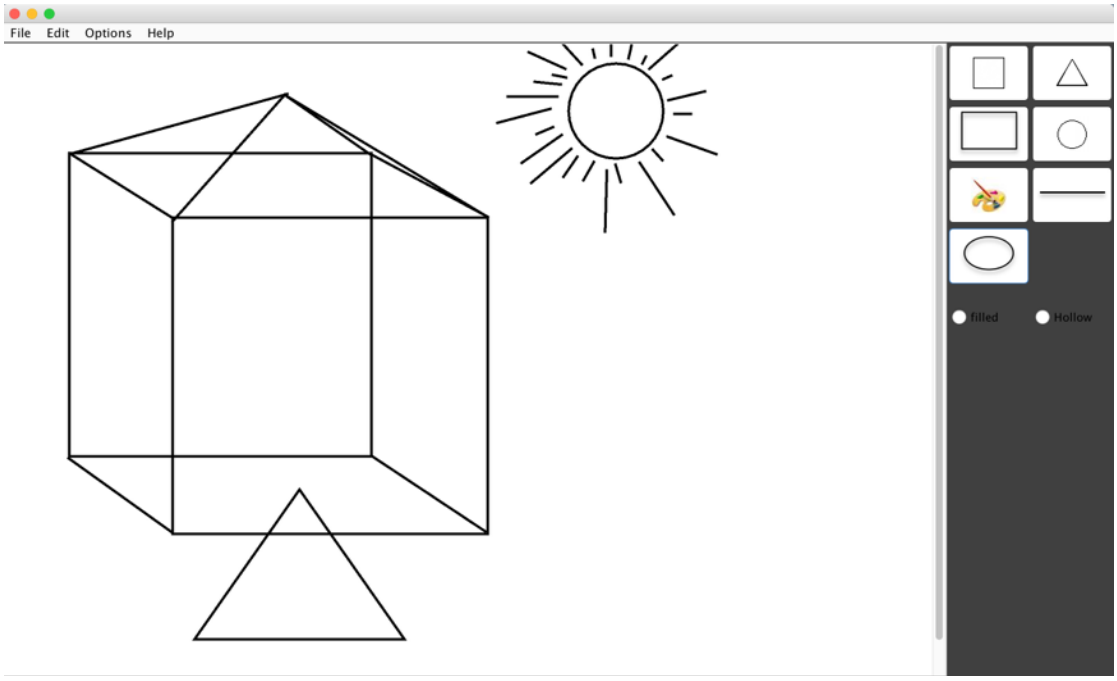


Now you start dragging your mouse on the screen in order to draw your desired shape with the desired size.

Just keep holding your mouse on the drawing field, extend your size, then release your hands from the mouse when you finish your end point:

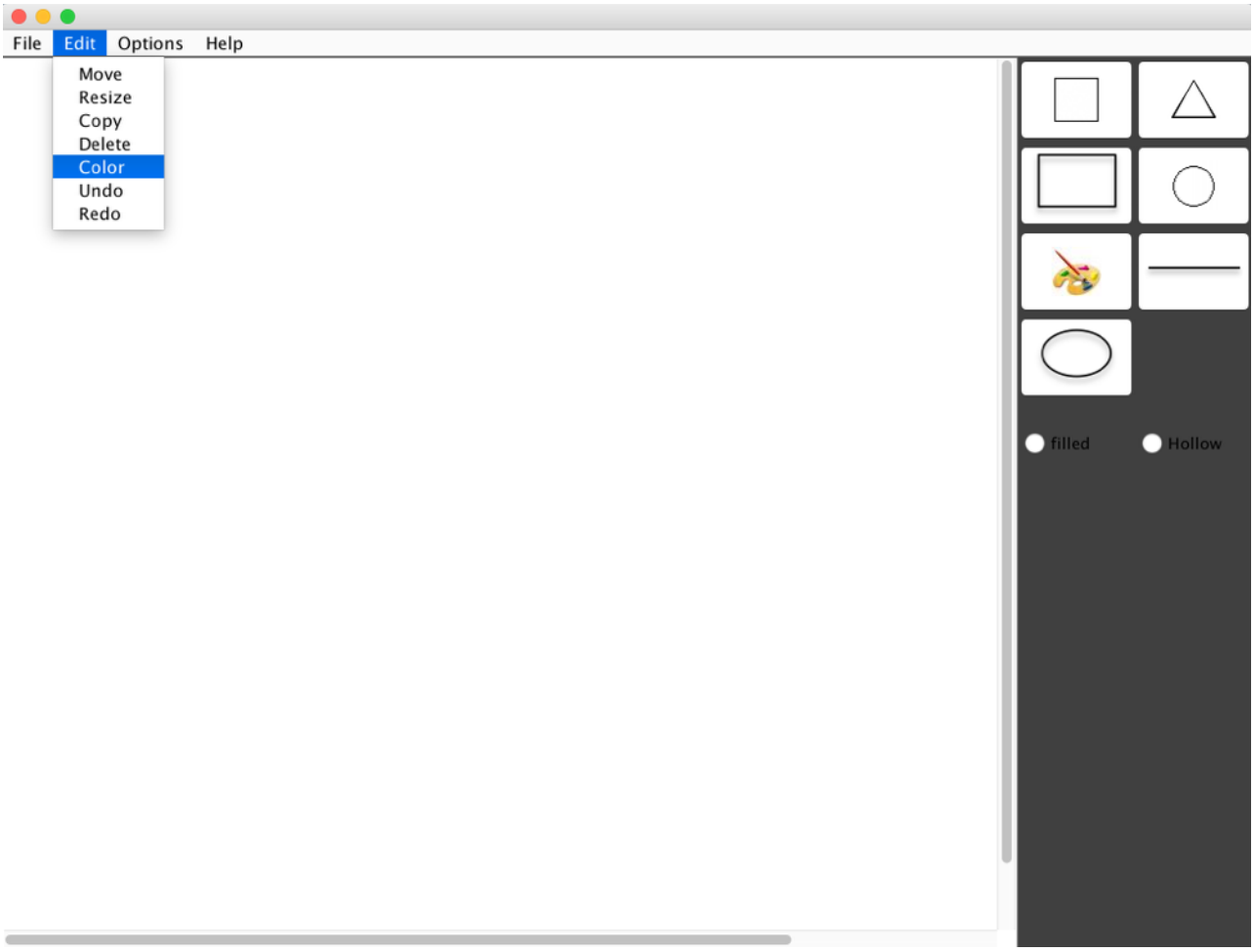


You can insert many shapes as you like into the drawing field in one time, so that you could design any shape you like:

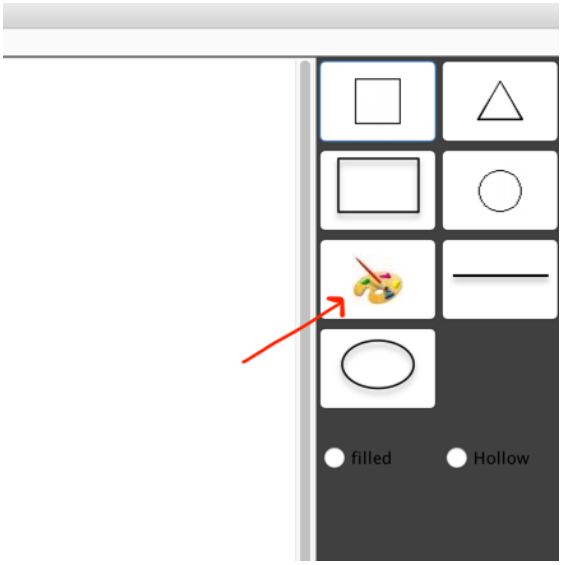


You can also draw using colours, just by selecting :

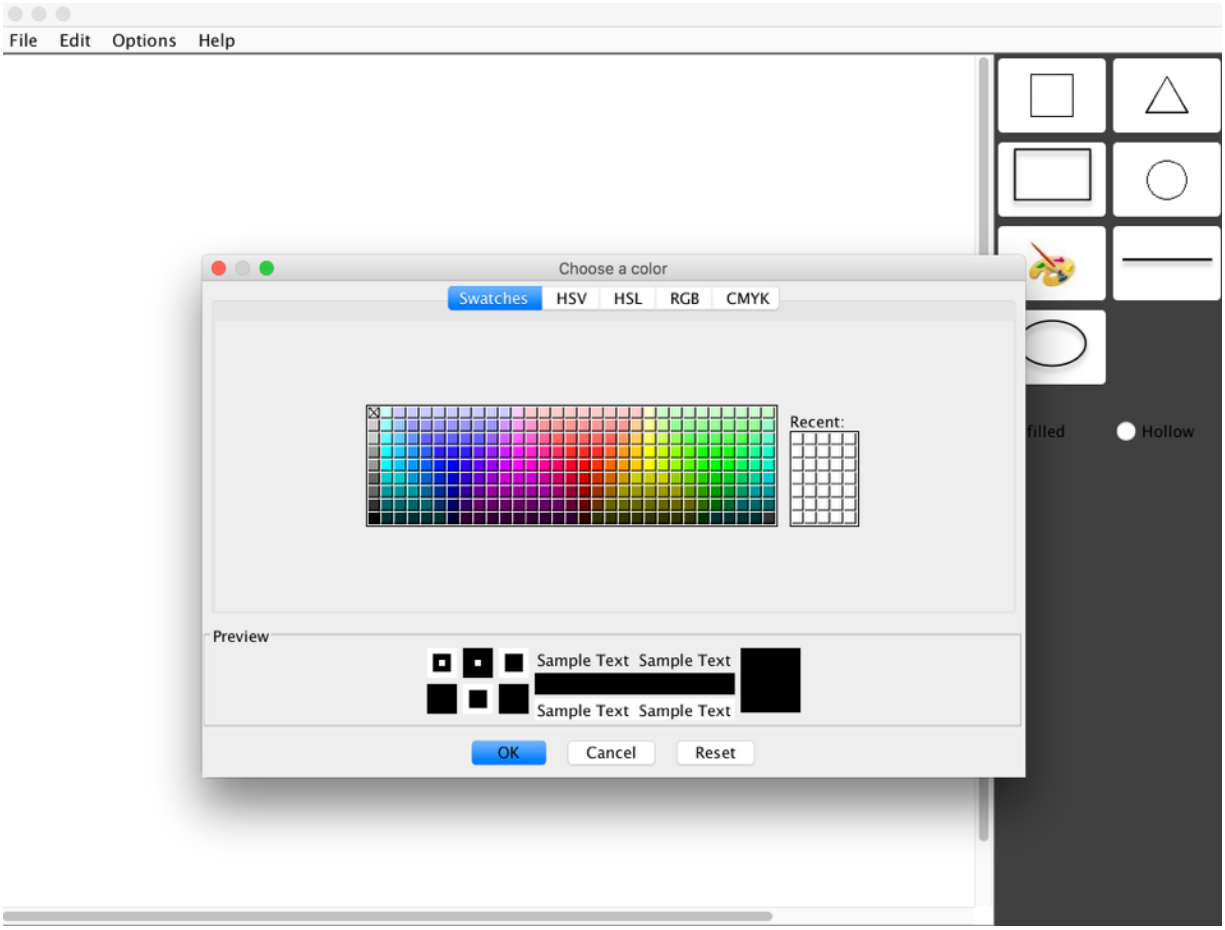
1-Edit
2-Colour



Then You choose the colour you wish your shape will be from the colour palette icon on the right panel of the application:

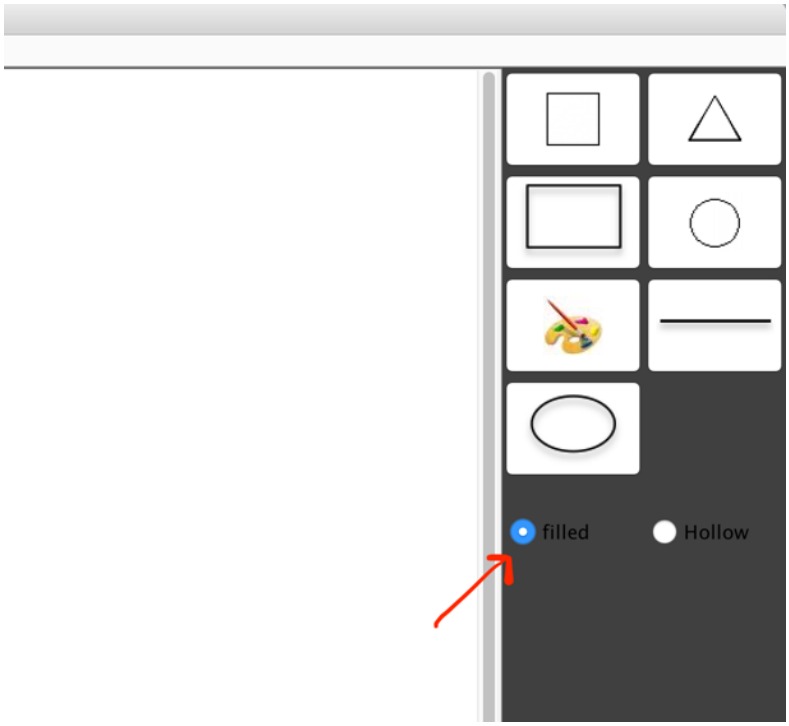


Then you pick your desired colour:

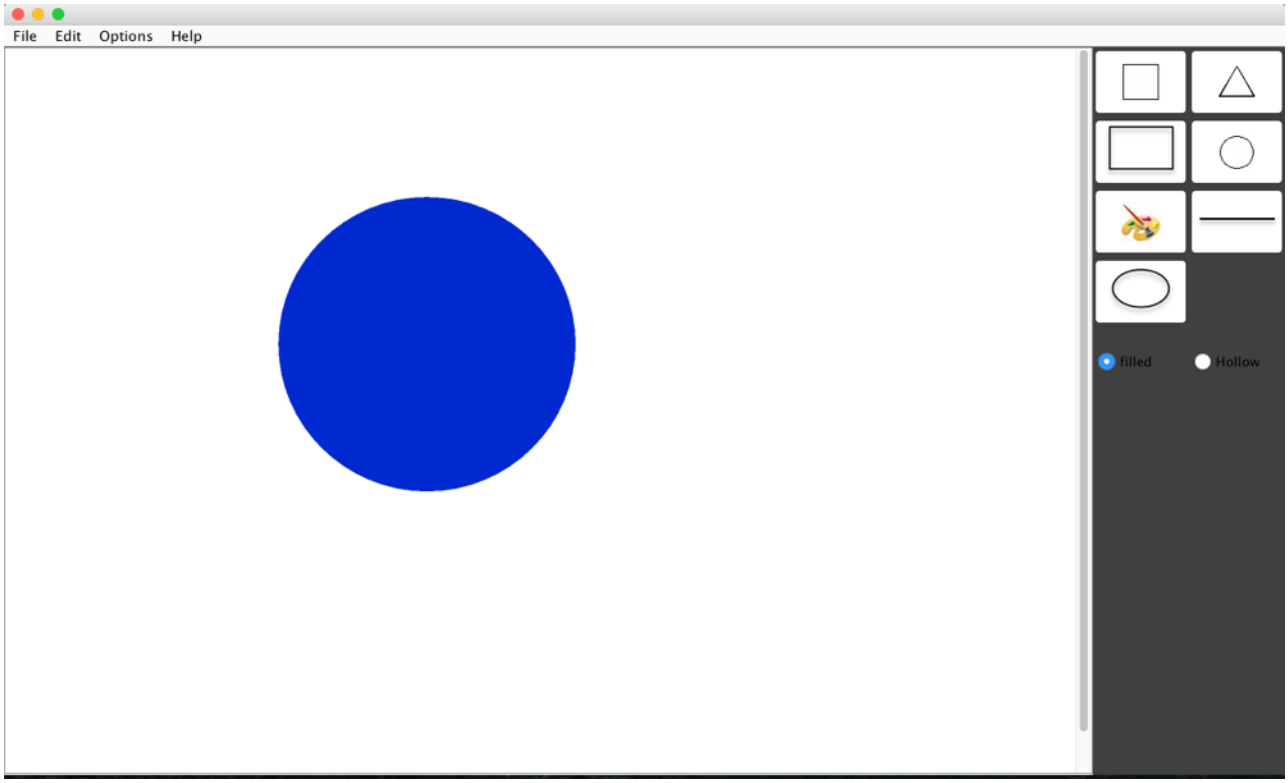


Then you Choose from the right panel whether you like the colour to be :

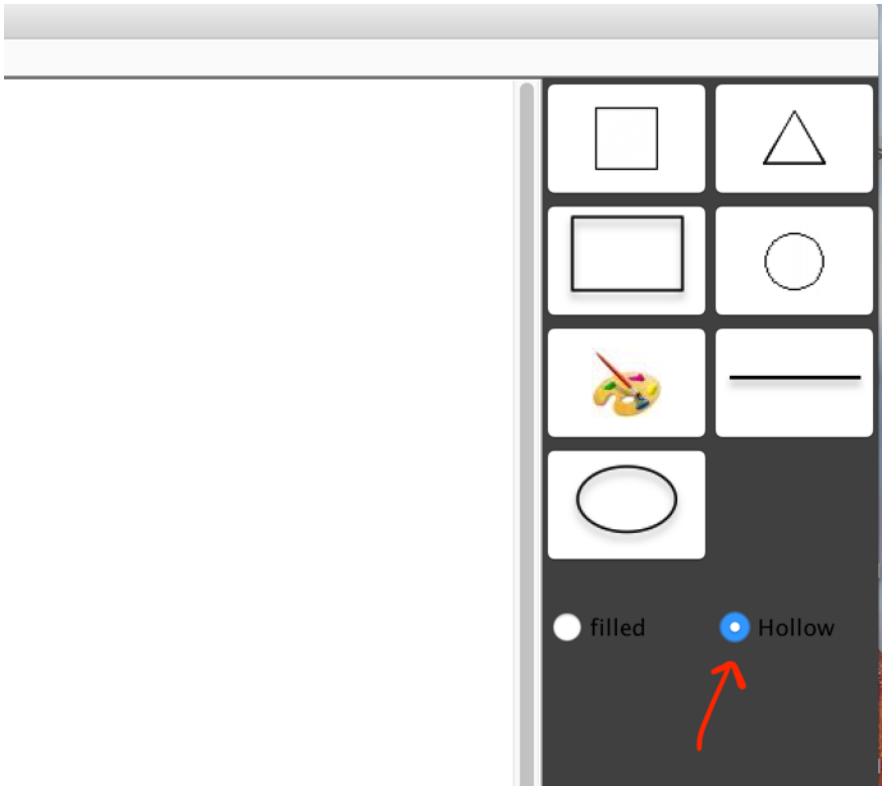
1) **FILLED :**



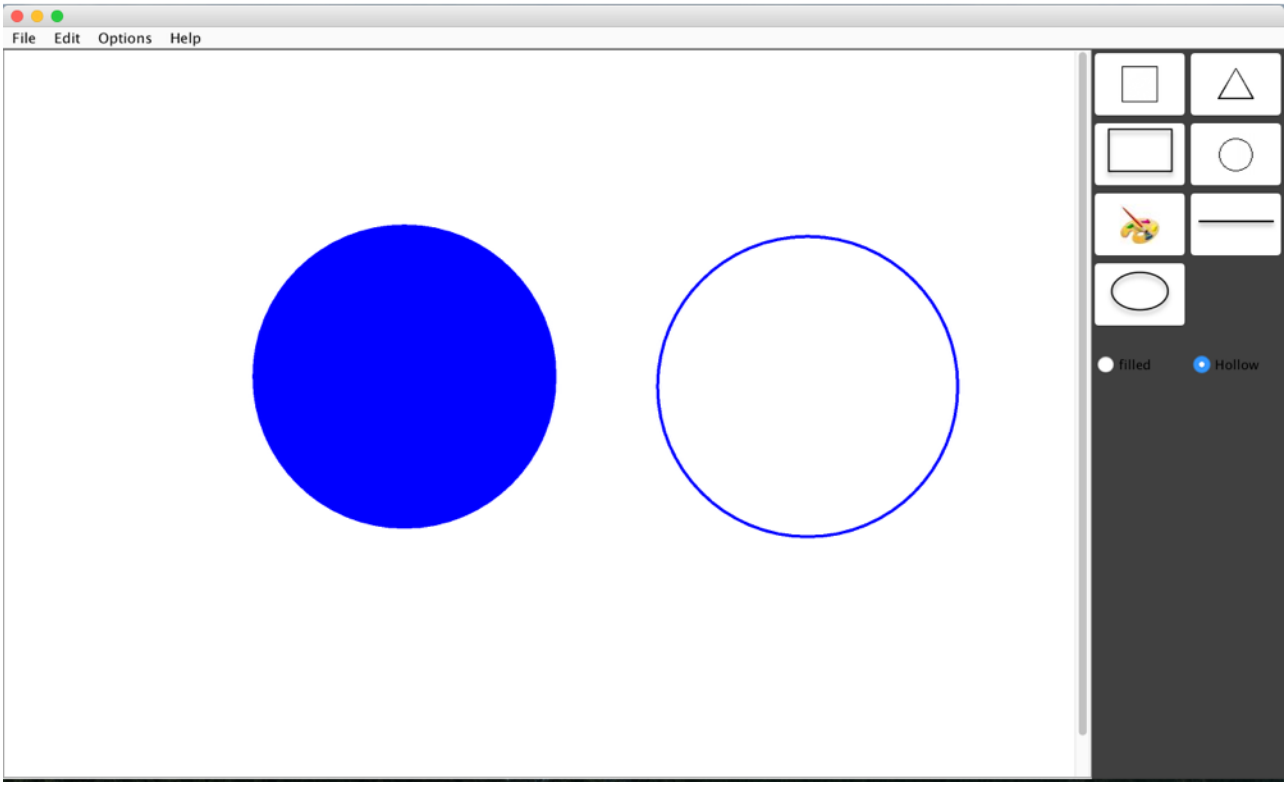
You first choose the shape you wish to draw, then you start drawing your shape:



2) HOLLOW:

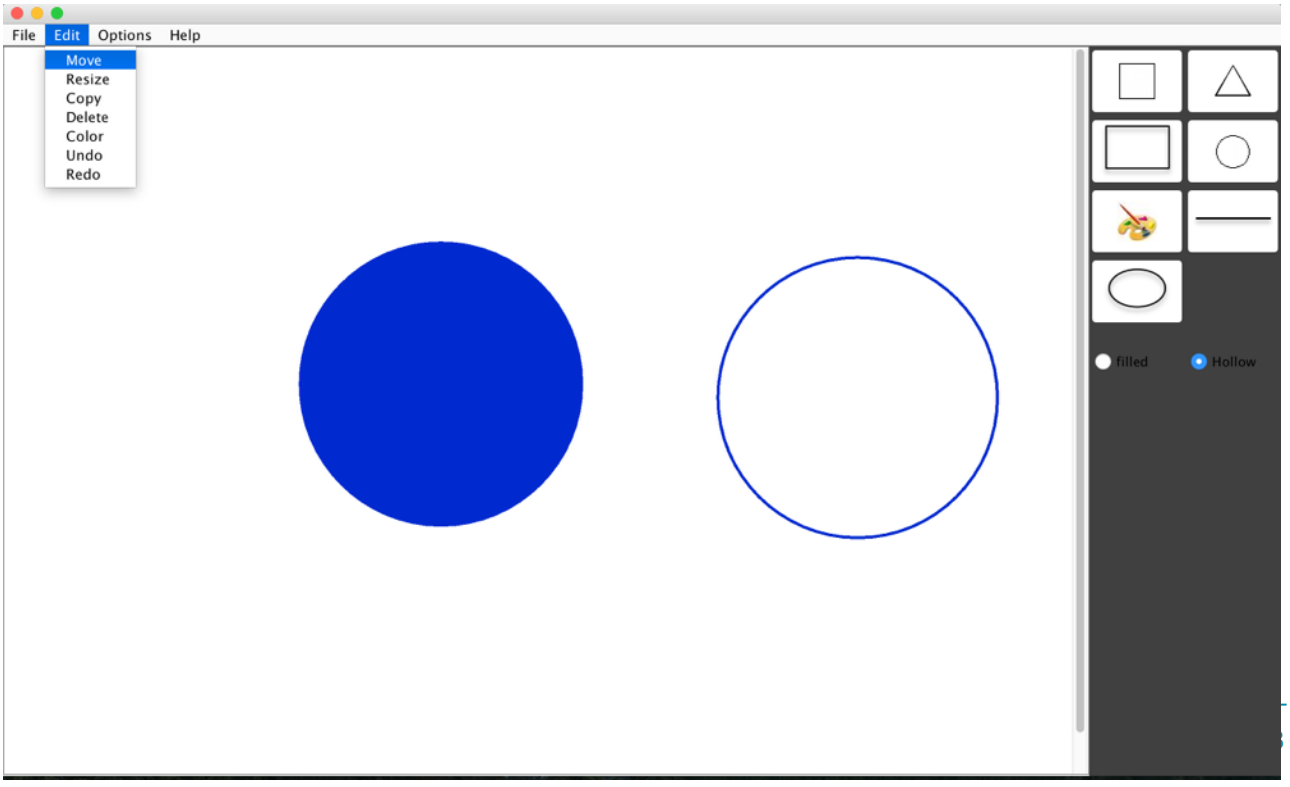


You also choose the shape you wish to draw, then you start drawing your shape:

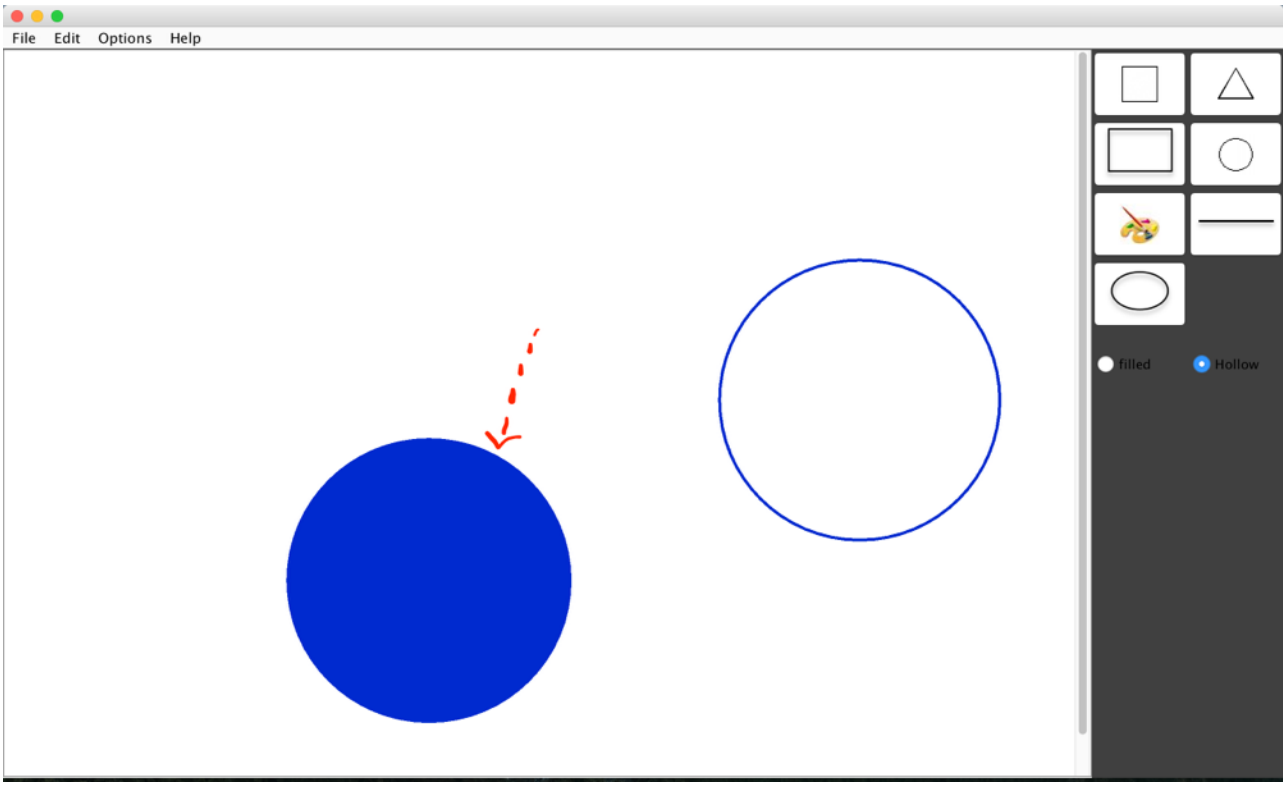


You can MOVE your shape by simply going to:

1) Edit
2) Move

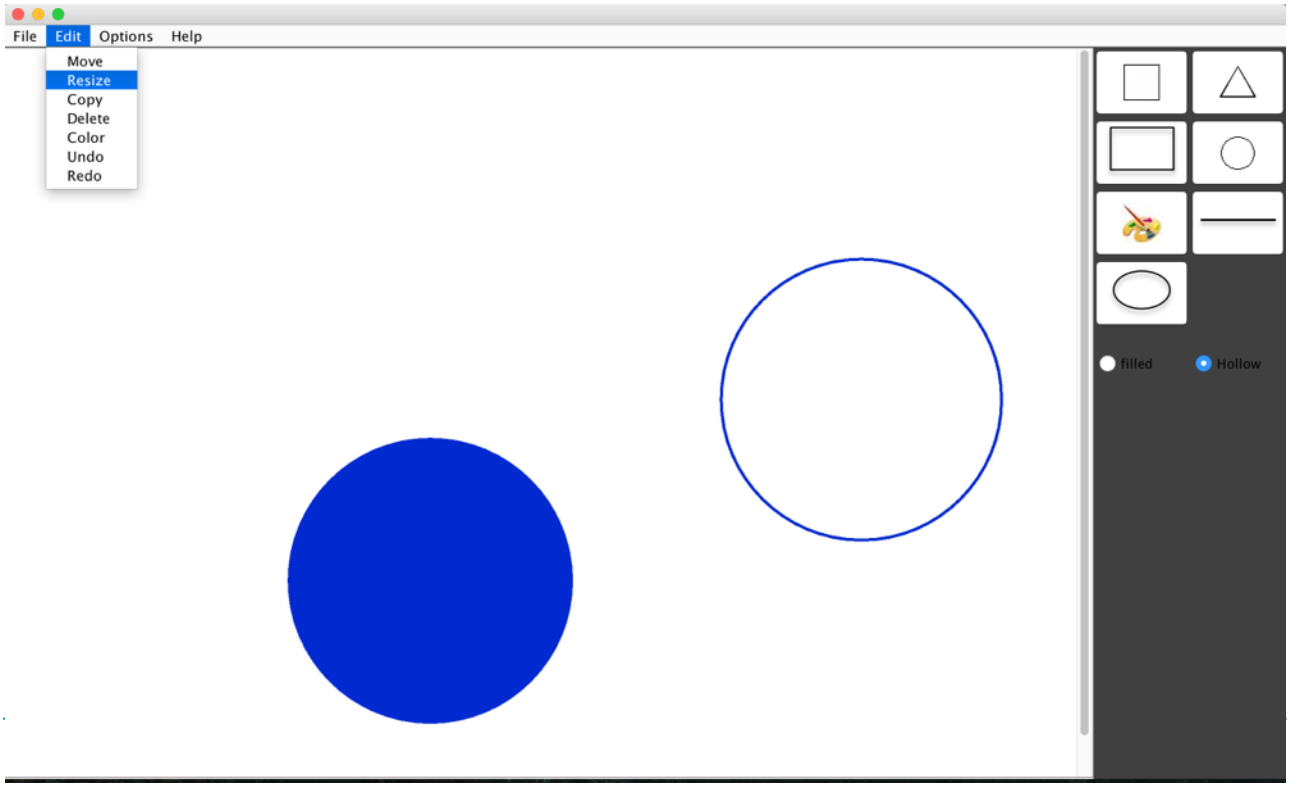


Then hover on the shape you would like to move, then press the mouse on it and keep pressing while dragging it into the desired place:

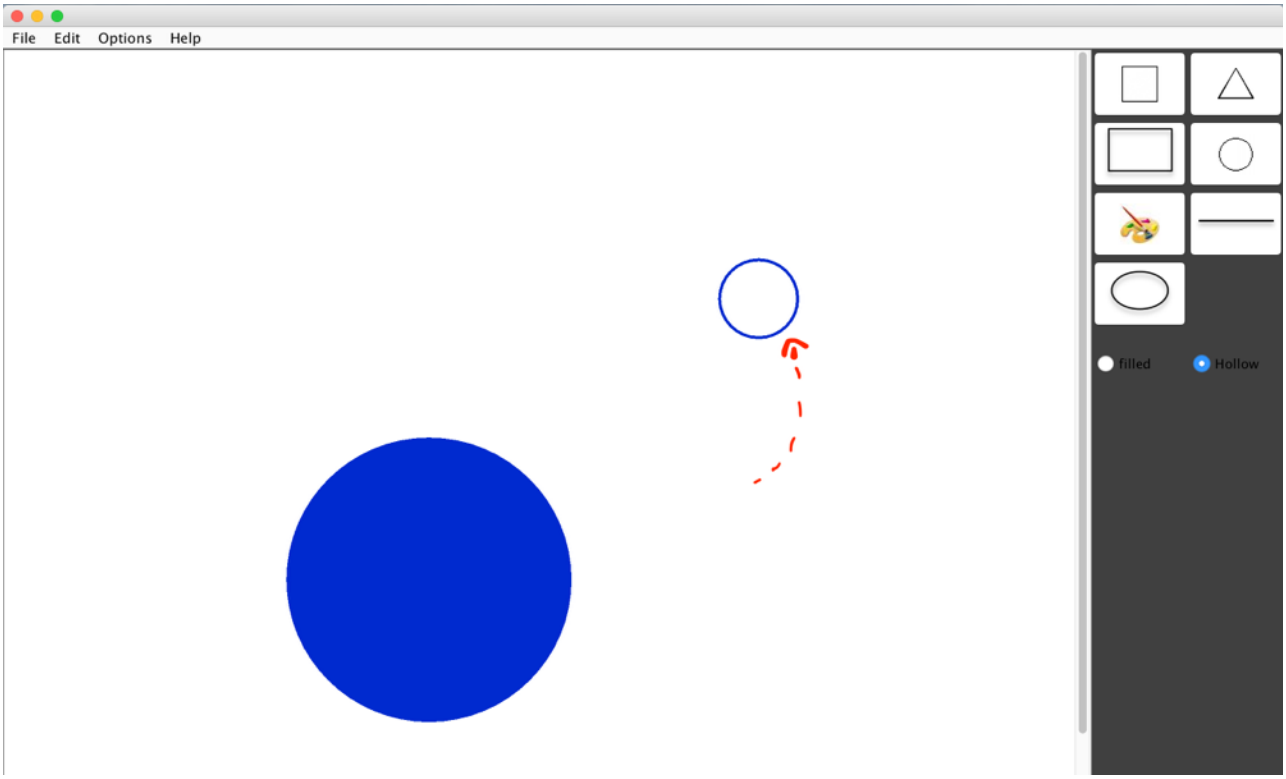


Also you can resize any shape by going to :

1) Edit
2) Resize

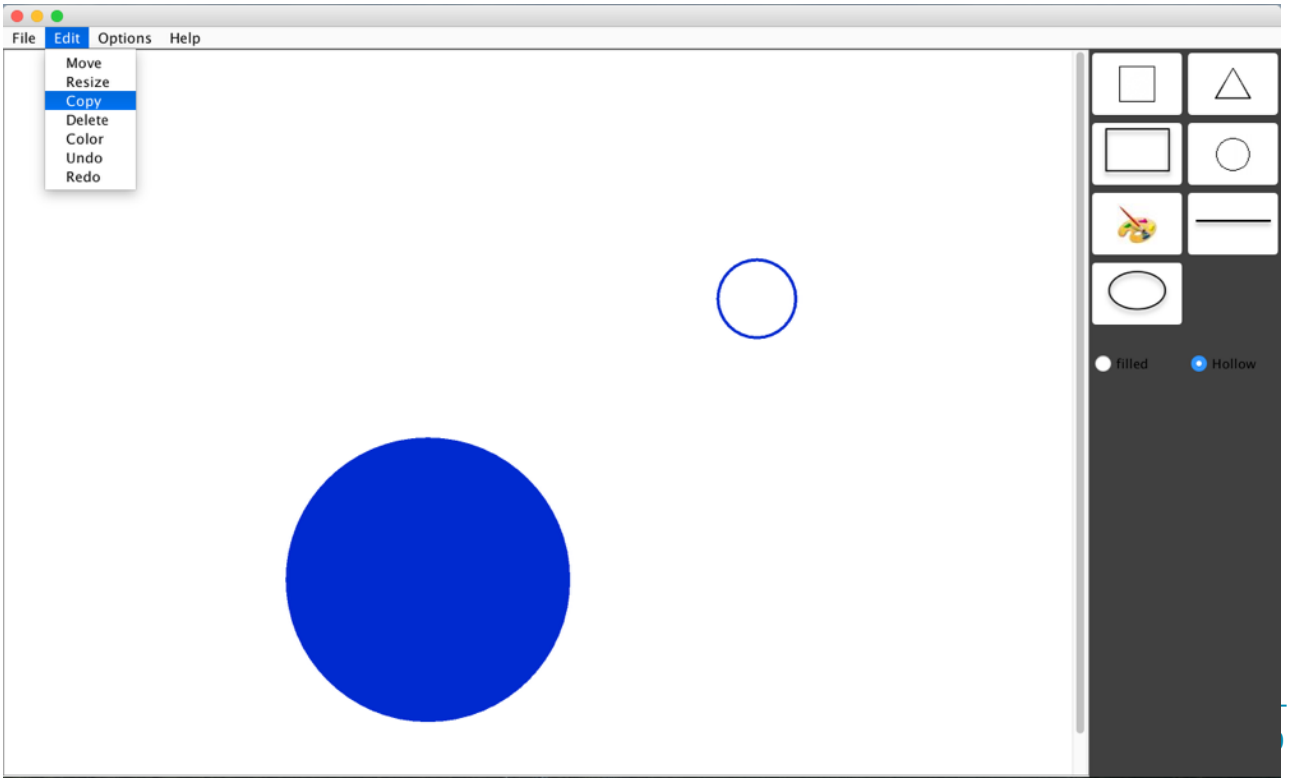


Then you just have to select the object you want to resize, by holding the mouse on it, then keep dragging till you reach your desired size:

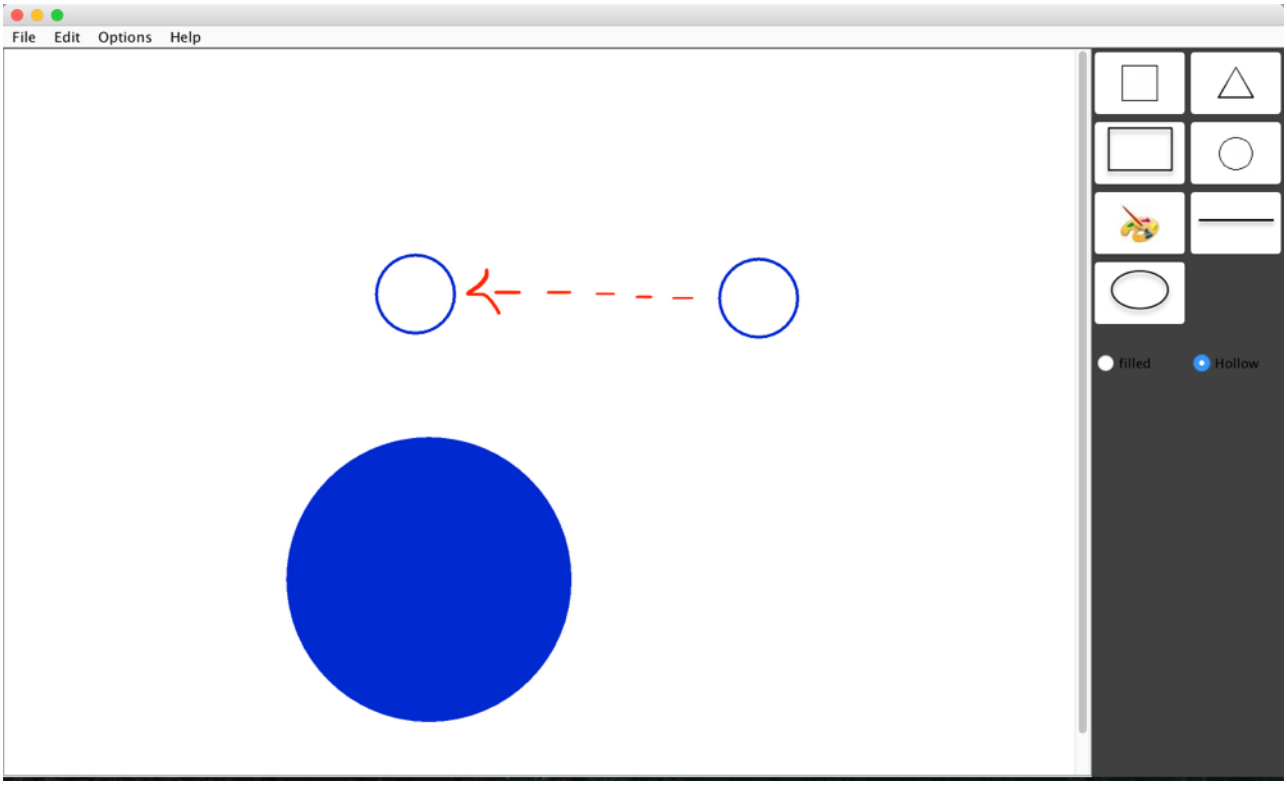


You can copy any shape you like by going to:

1) Edit
2) Copy

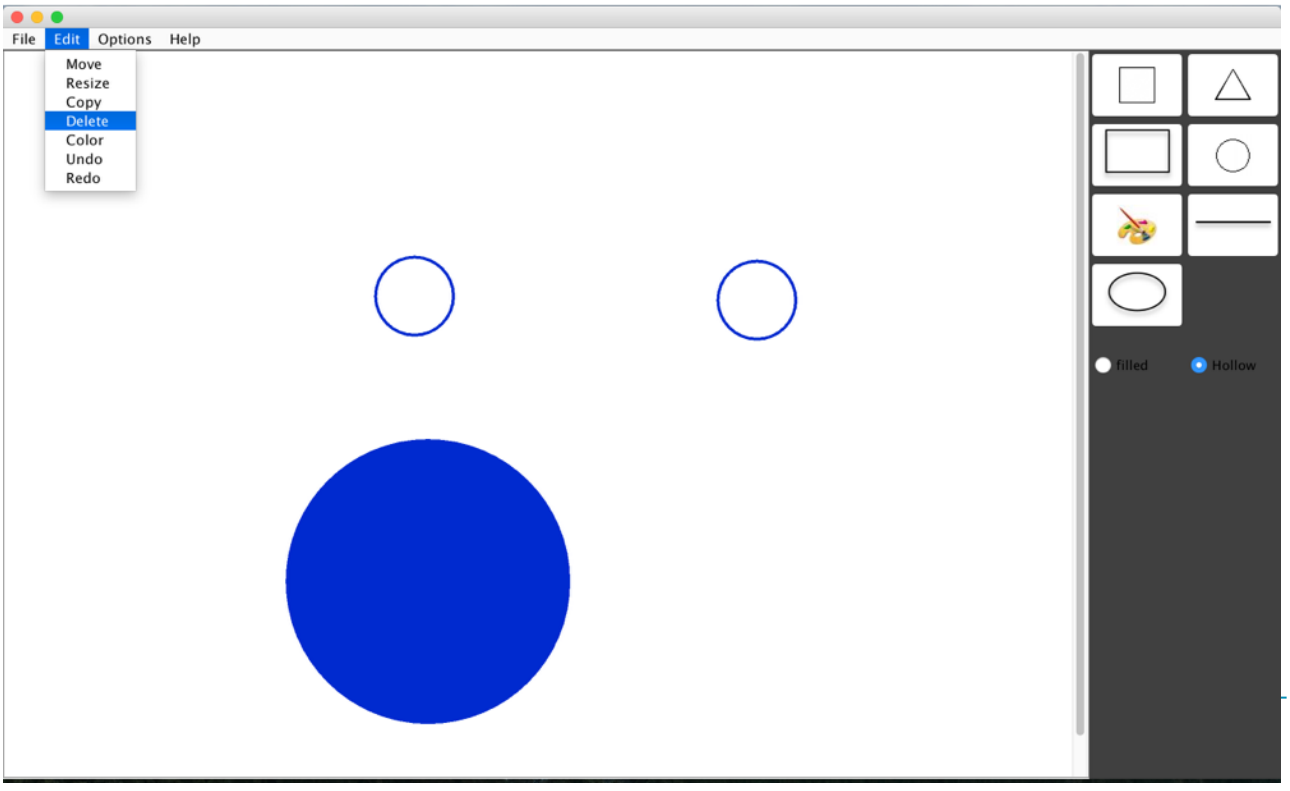


Just select the shape you wish to copy , then keep holding on it white dragging your mouse, then release your copy in the place you like:

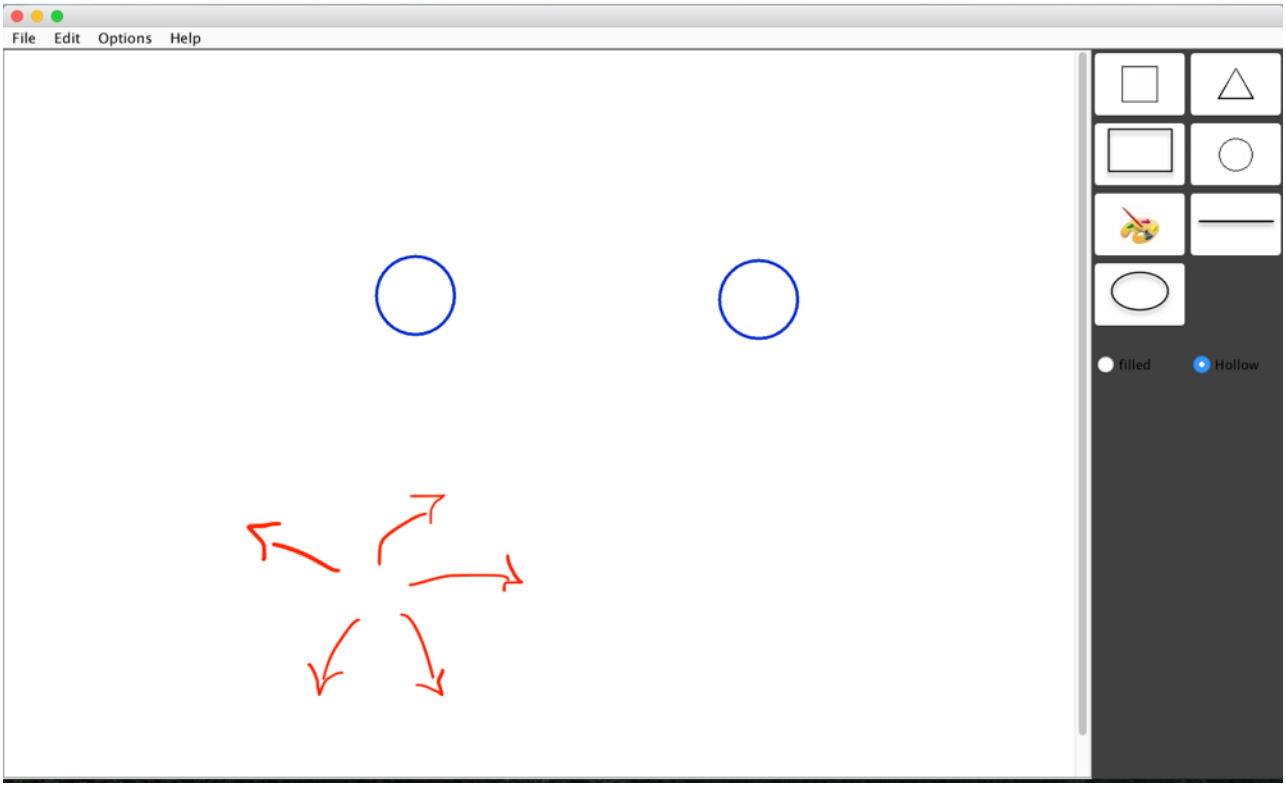


You can delete any shape by simply going to:

1) Edit
2) Delete

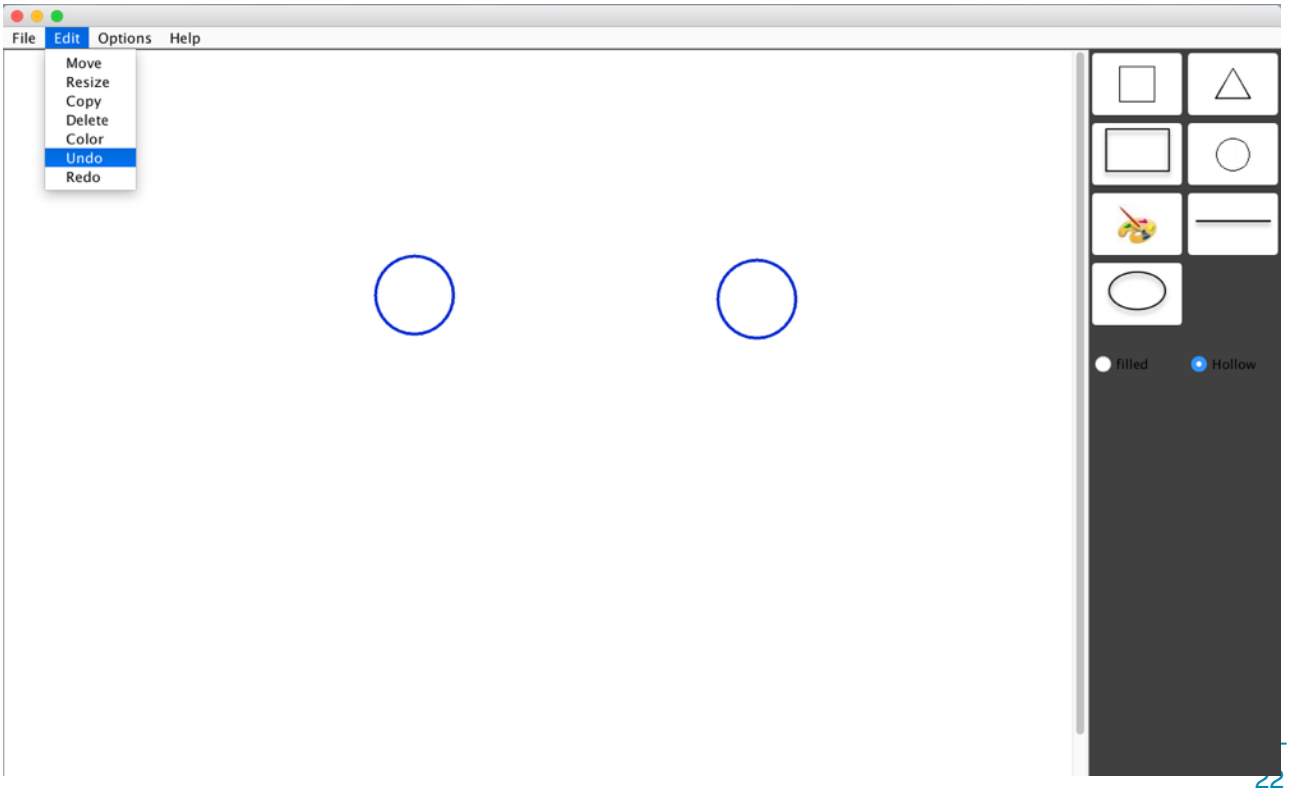


Then just select the shape you wish to delete:

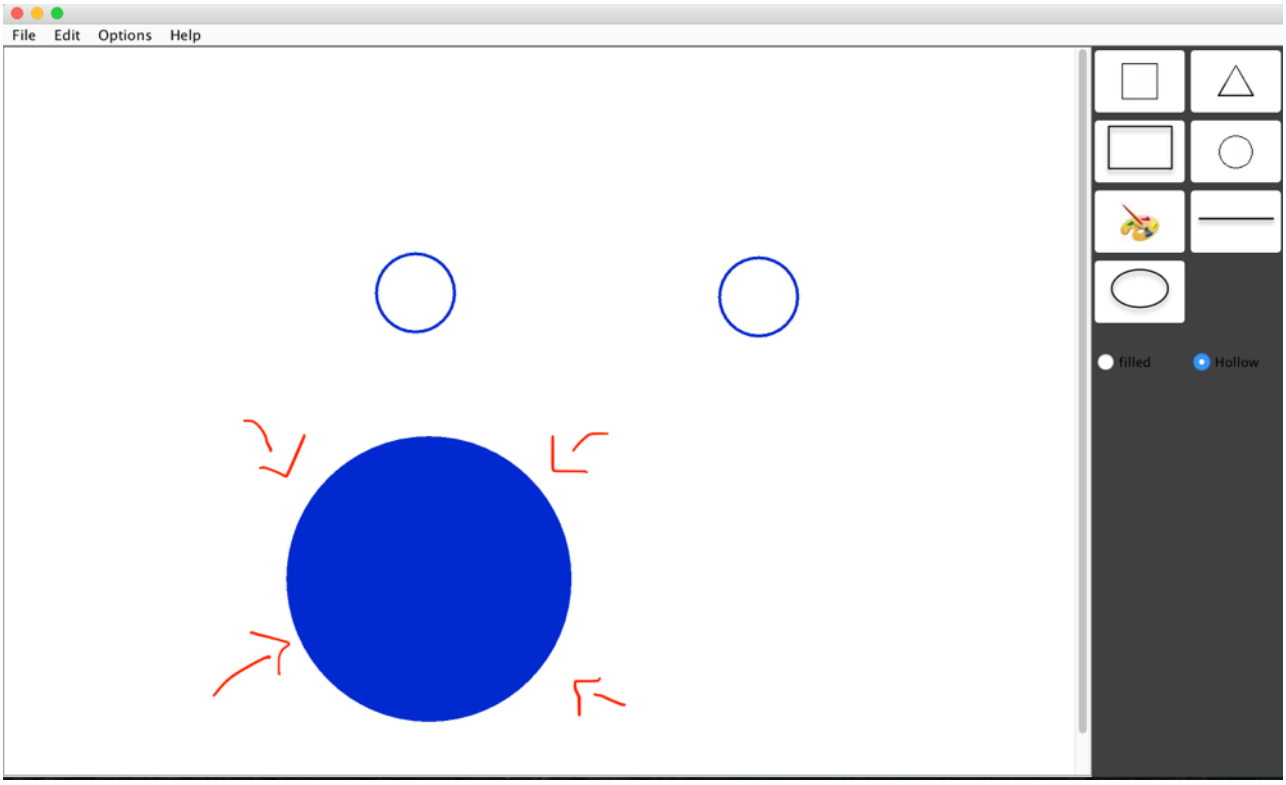


If you wish to undo your last action, just go to:

1) Edit
2) Undo

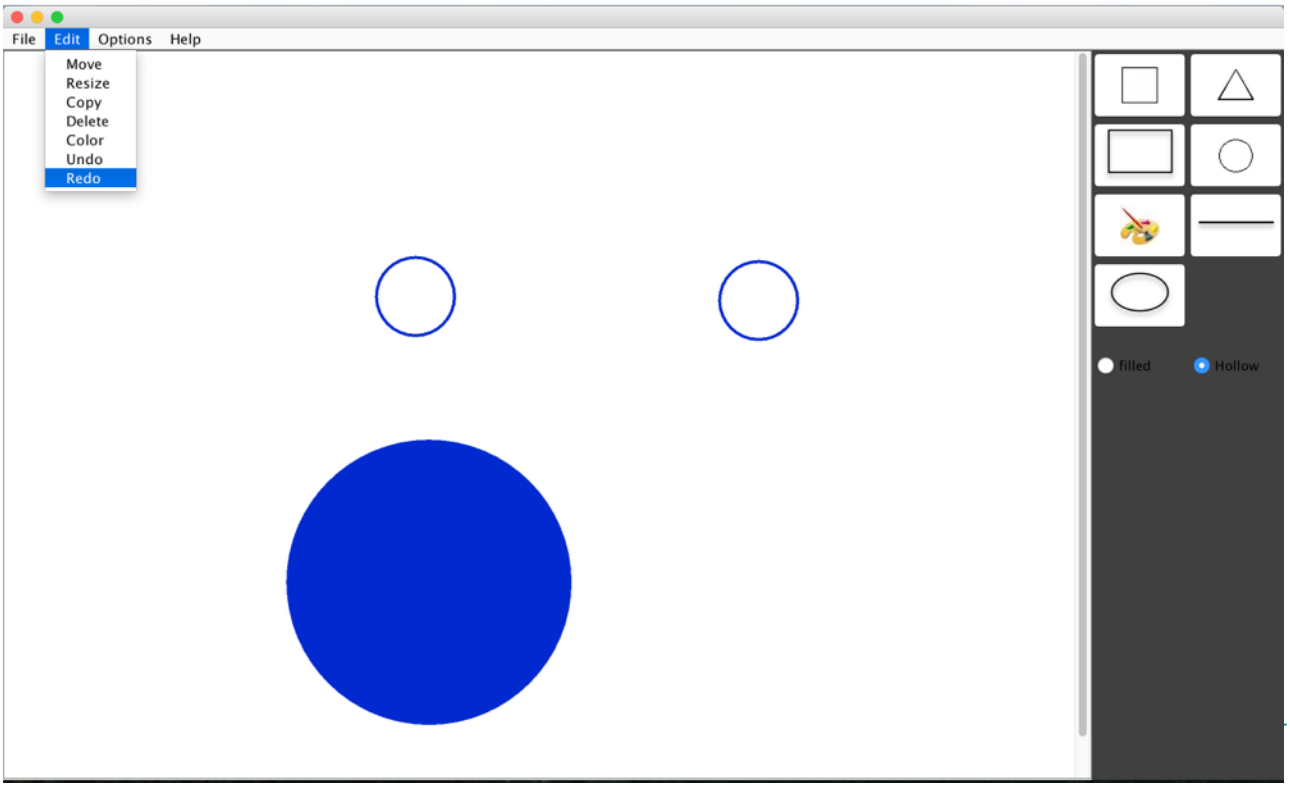


Then it is done !

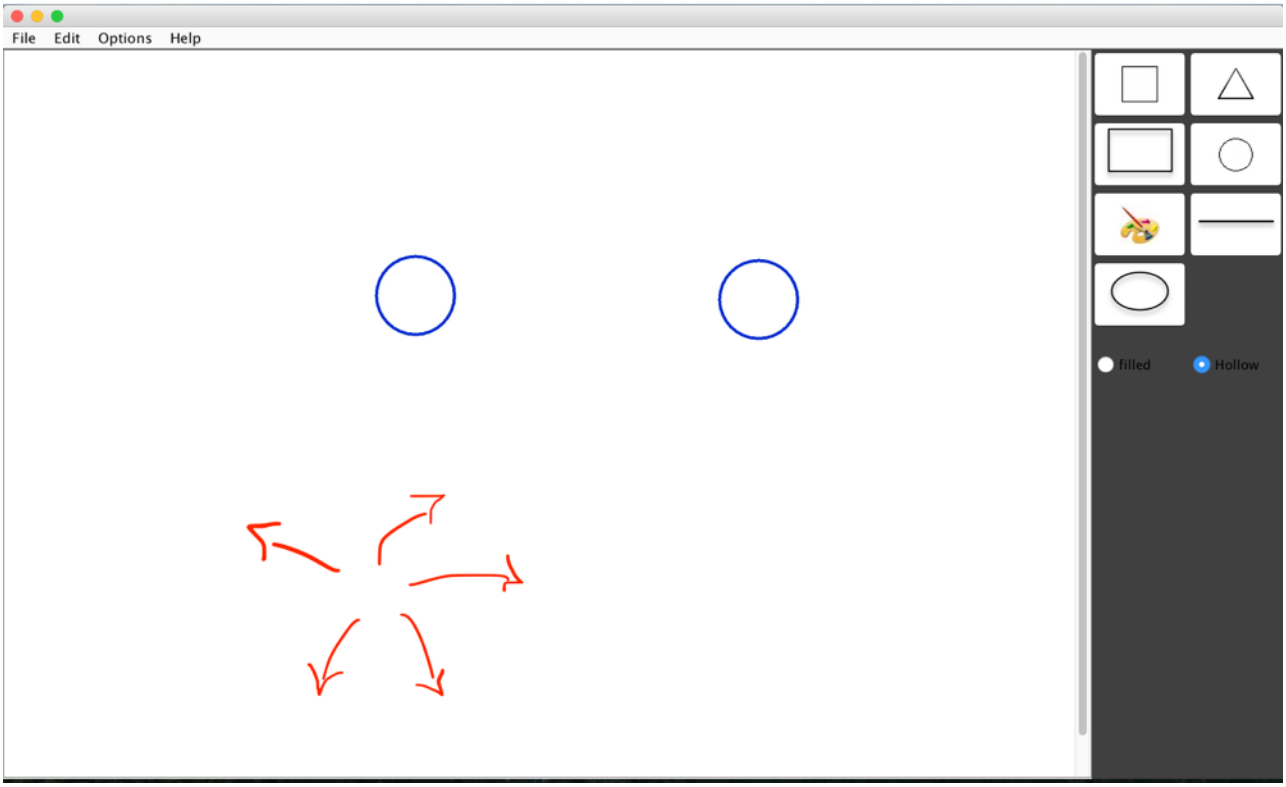


Or you can Redo your last action, just by going to:

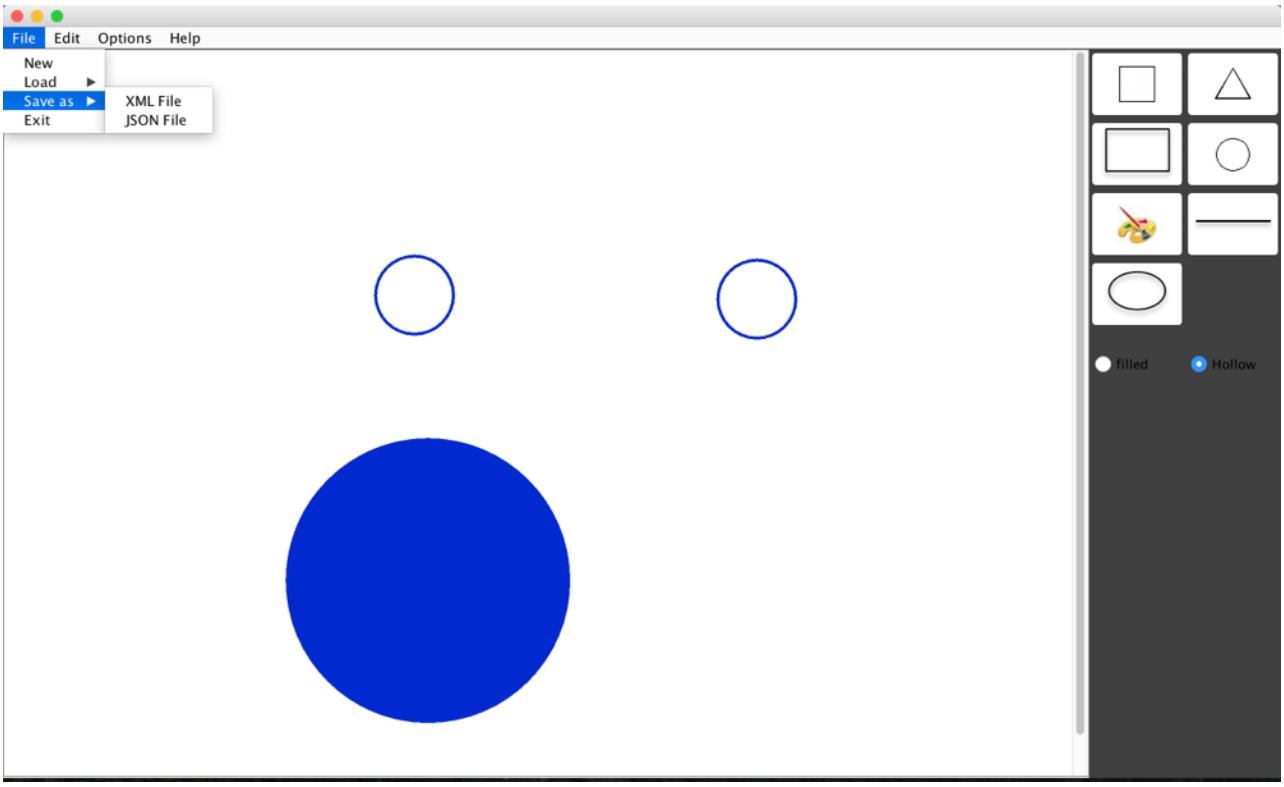
1) Edit
2) Redo



Then it will Redo the last action:

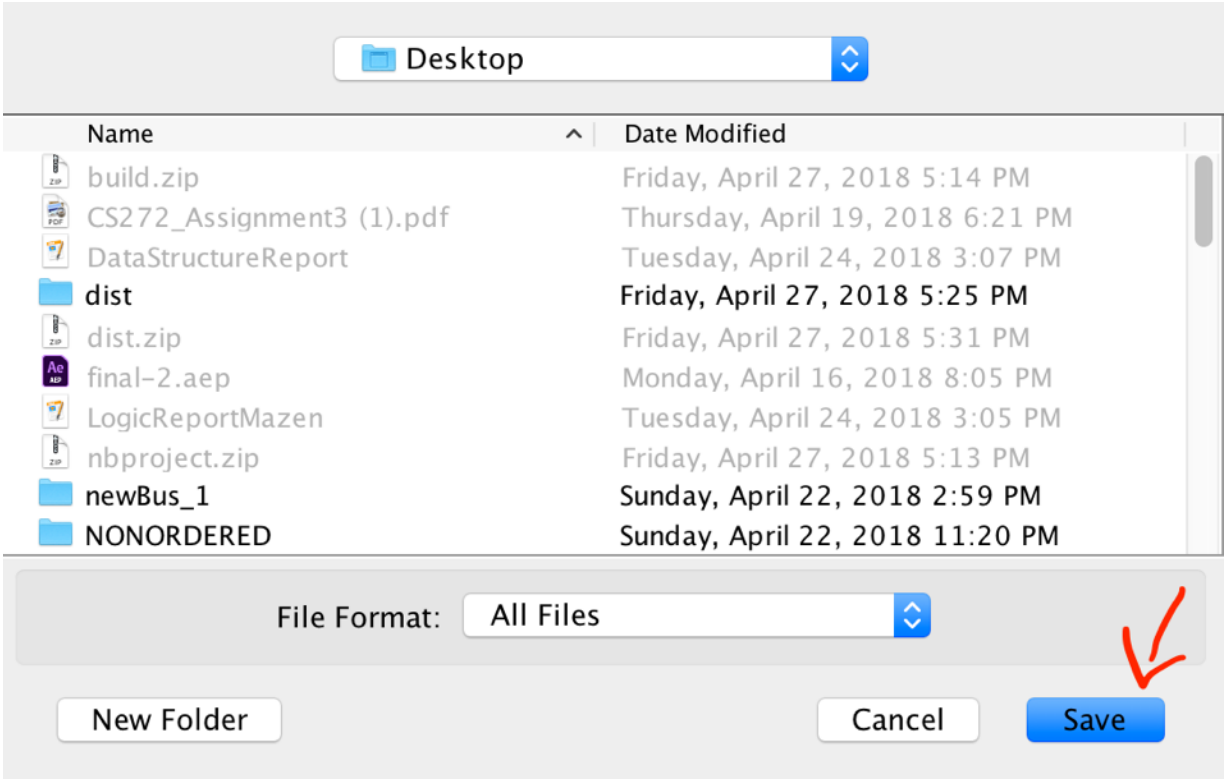


After you finish your drawing, you can save your work in any file from here:

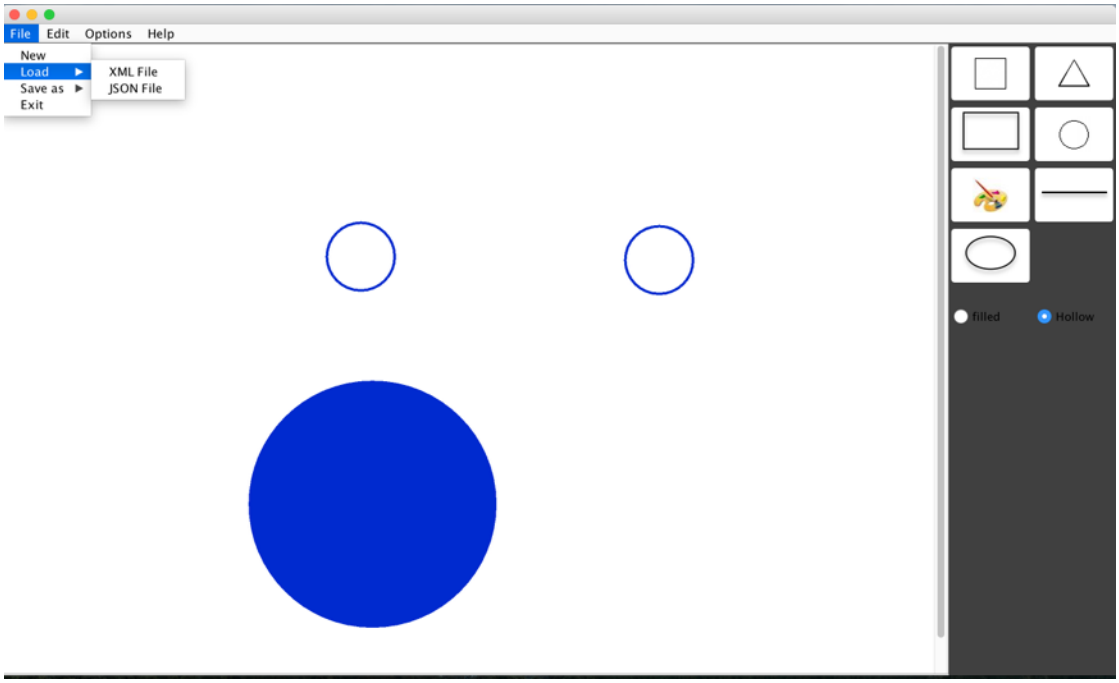


Just choose if you wish the file to be XML or to be JSON file.

Then press on “Save”:



Also you can Load previous projects you have done, so you could edit later, just by going to:



Then choose whether your file was an XML or was a JSON one, then load it up.