

Assignment 2

**Vector Based Drawing
Application**

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Vector Based Drawing Application

Part 1: Geometric Shapes Data Model Description:

Geometric shapes belong to different groups (ex: Elliptical Shapes, Polygons, Sectors...etc). Members of these different groups are related to each other in the sense that they share common properties. In order to be able to implement an efficient and object oriented drawing application. It is essential to design a model that takes these relations into consideration. So our design creates a super class called "Our Shape" that implements shape interface and contains the common properties and all shapes classes extend these super class. Functionalities that controls drawing in canvas (ex : add shapes, refresh, delete, save, load...etc) on all shape are the same so they are all in the same class that implements "DrawingEngine" interface which used in GUI classes.

Part 2: Drawing and Painting Application Description:

Design and implement a GUI that allows the following functionalities for the user on all the shapes defined in part 1: Draw, Color, Resize, Move, and Delete which can be done by using cursor to select a drawn shape to show its properties and allow him to change what he wants. Also the application would allow the user to undo or redo any action performed. The GUI design consists of:

- 1- Main frame contains 3 parts:
 - (1) Menu bar contains:
 1. Save icon
 2. Redo icon
 3. Undo icon
 4. File list
 - (2) Panel contains list of available shapes
 - (3) Drawing area (canvas)
- 2- Properties panel which opens when a drawn shape is clicked or when creating a new shape and contains:
 - (1) The properties of the shape
 - (2) Delete button
 - (3) Clone button
 - (4) Choose colors button
- 3- Choose color panel opens when clicking in its button in properties panel
- 4- Clone panel is used to enter the new position of the shape.

Part 3: Save and load Description:

One of the main features in any paint application is saving user's drawings in a file and modifying it later. So our Application provide an option in GUI to save the drawing in XML and JSON file which can be loaded later to modify it. There is shortcut of save icon in menu bar or user can find it in file list in the menu bar. Load icon exists in file list in the menu bar.

Design decisions:

- 1- User should follow the instruction when enters properties of any shape to have the best results.
- 2- The application provides a panel with huge number of colors to meet user needs.
- 3- There is a clear list of shapes that user can use to draw.
- 4- In save and load file dialog box opens to choose the path of the file.

User guide:

- **Start program**

1. User starts the program then select shape he wants to draw (eg: circle).
2. Window will appear showing the shape properties.
3. The user must enter the color of borders or fill or both , enter position (x & y) and rest of properties of the shape (eg : width , height for rectangle or radius for circle).
4. Press "ok" button to draw the shape.

- **Clone shape**

1. If user wants to clone any of the drawn shapes, he should press on the desired shape.
2. The window of properties will appear.
3. Press on "clone" button and window will appear to make user enter the new position for this clone of shape then pressed on "ok" button in this window
4. User should press on "ok" button in window of properties.

- **Delete shape**

1. If user wants to delete any of the drawn shapes, he should press on the desired shape.
2. The window of properties will appear.
3. Press on "delete" button to delete the shape.

- **Redo and undo**

1. If user wants undo any step click on undo icon in menu bar.
2. If user wants redo any step click on redo icon in menu bar.

- **Exit program**

1. If user wants to exit the program then from file list in the menu bar click on exit.

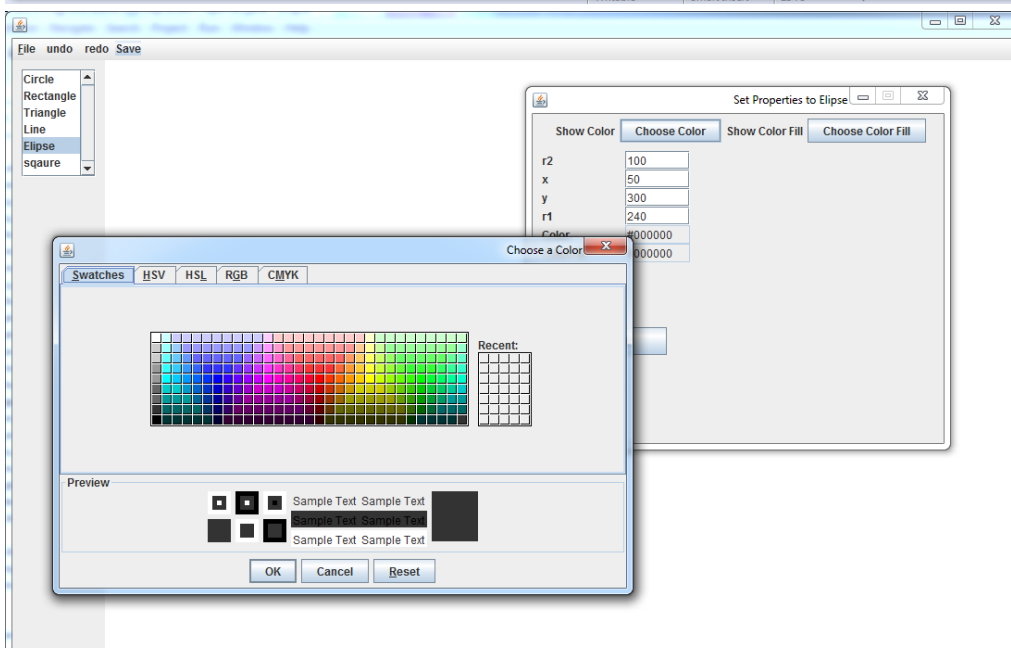
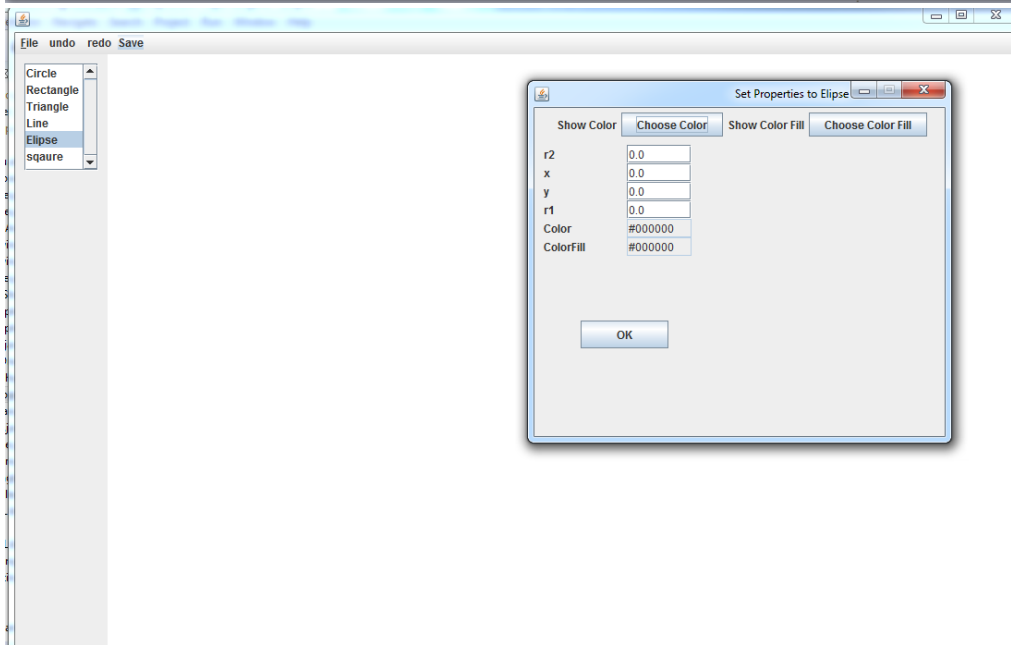
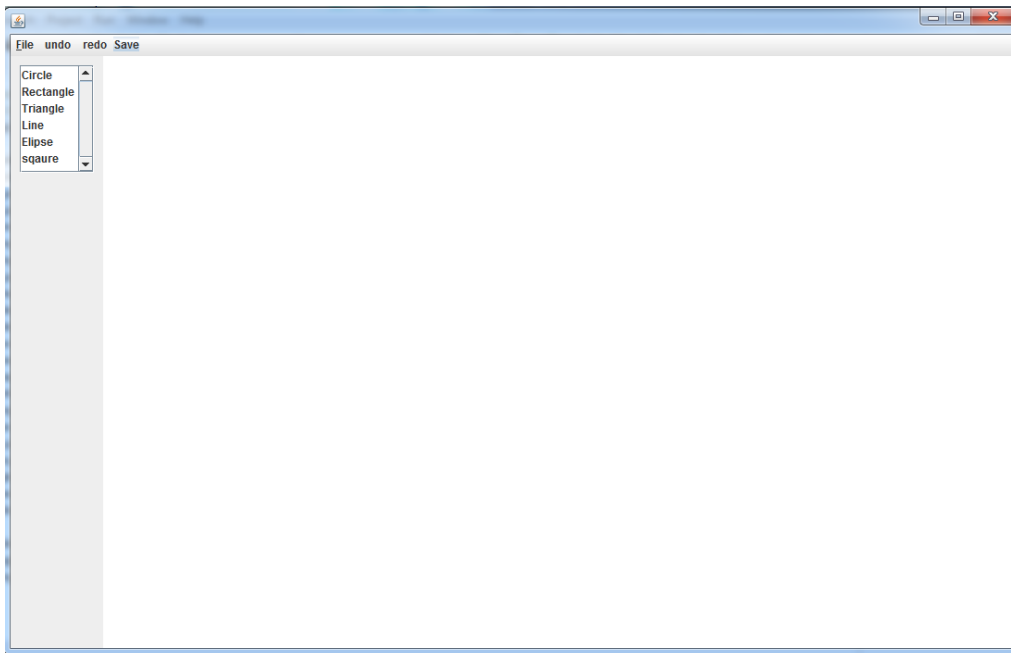
- **save program**

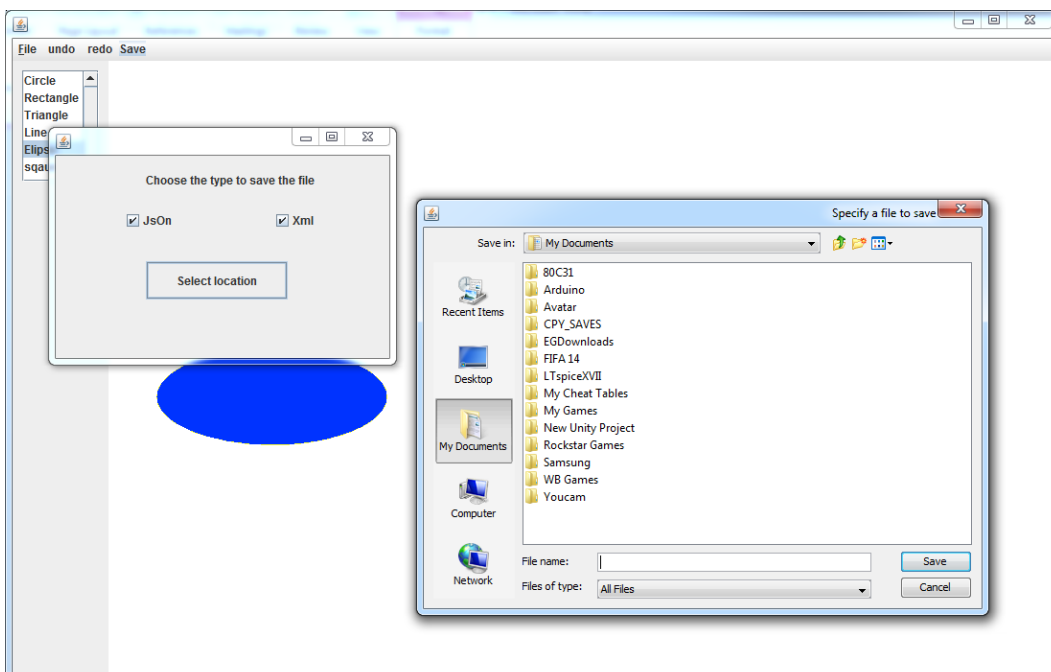
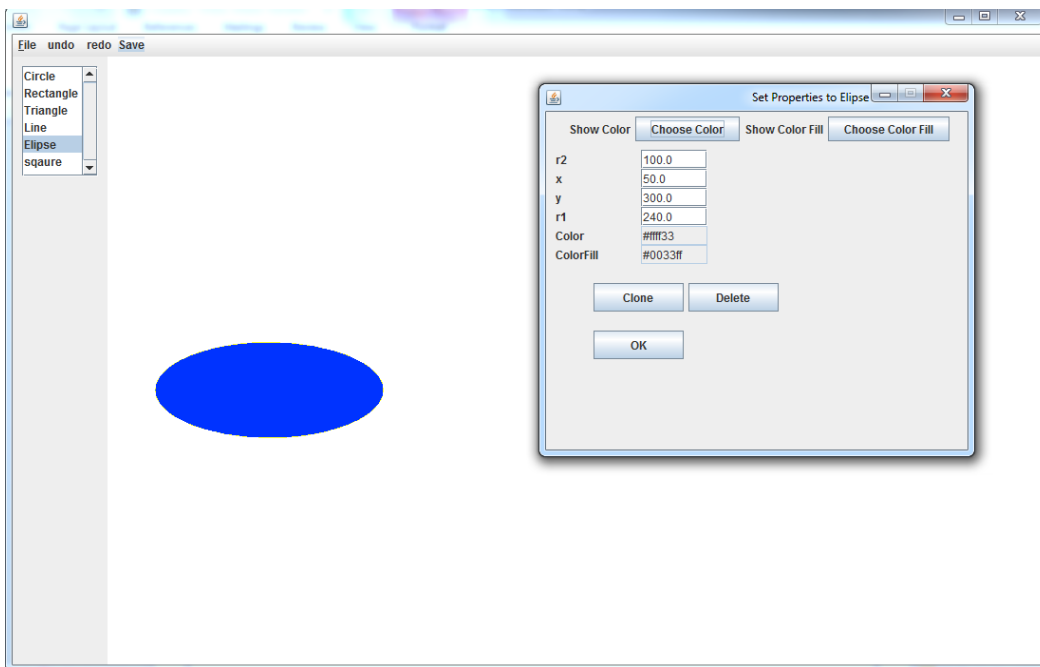
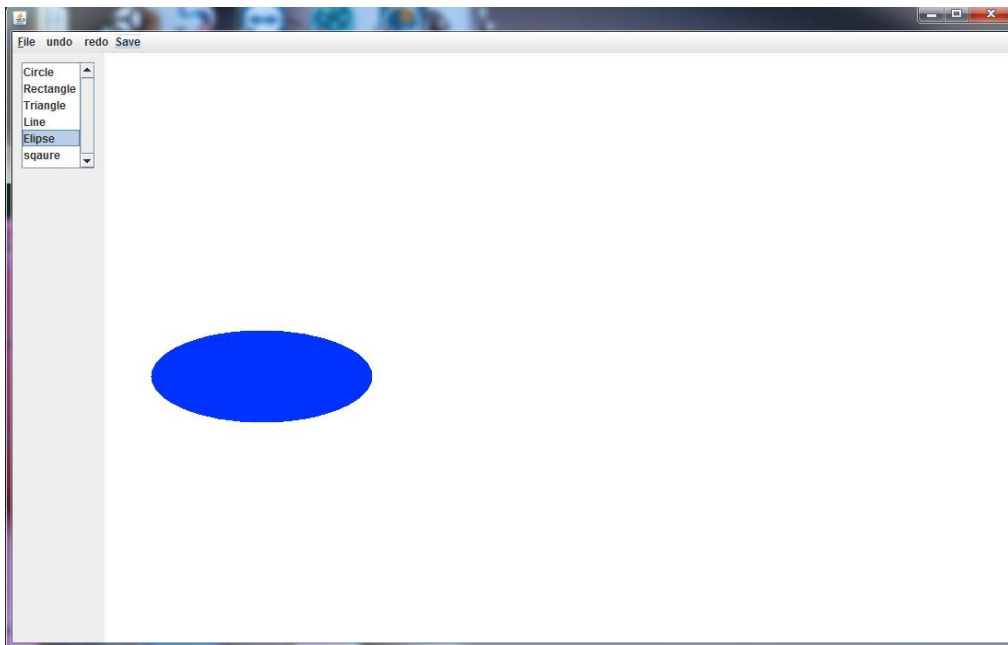
1. User can press on save icon in menu bar or in the list of file.
2. Window of save will appear and user choose the type of file he wants to save file (Json , Xml or both) .
3. User selects the location to save it by pressing on button of select location and writing the file name then click "save" button.

- **load program**

1. User must press on load which in the list of file in the menu bar.
2. Window will appear to choose the file.
3. Click "ok" button to load the chosen file.

Snapshots:





UML diagram:

