Final's Project – Graphics

Paint Project

Create a paint project that draws circles, rectangles, lines, characters, and random shapes using the mouse as a pen. Figure 1 shows the intended GUI layout design of the project.
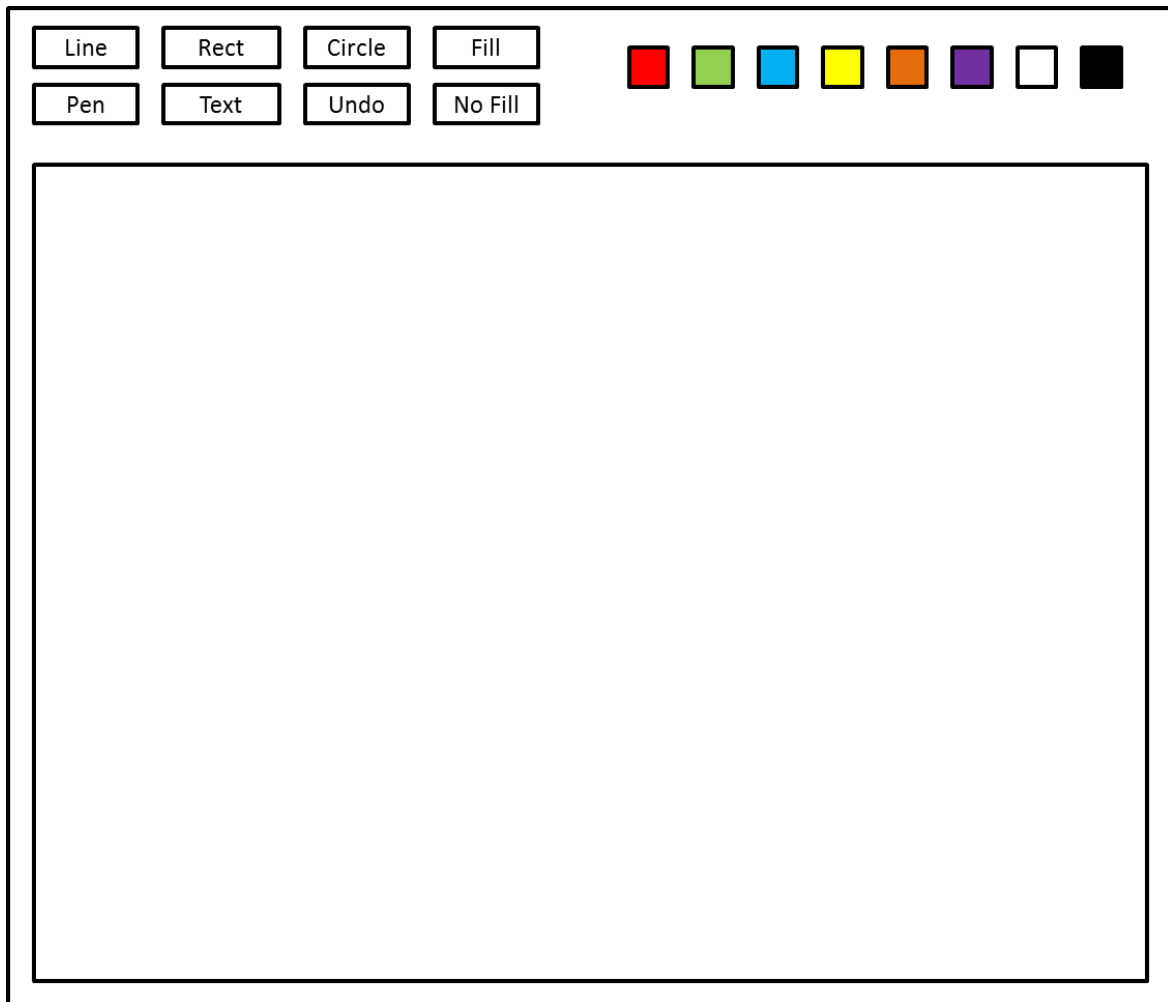

Figure 1 - Paint project design

Project details:

1. Programming language: C++, allowed libraries: glut, stdio, stdlib, and math.

2. The top right area of the window contains 8 buttons to select the color, from a simple palette, before drawing any shape. If no color is selected, black is automatically used.

3. Eight buttons are created at the top left part of the window; their functions are as follow:

   a. The line button draws a line using the mouse. The line is created using the drag/drop property. The user clicks somewhere, indicating the starting point of the line. Next, the endpoint is selected by dragging and dropping the mouse into another location.

   b. The Rect button draws a rectangle using the mouse. The rect is created by drag and drop. The user clicks, indicating the starting corner of the rectangle, then dragging and dropping indicate the end corner of the rectangle.

   c. The circle button draws a circle using the mouse. The circle is created by drag and drop. The user clicks, indicating the center of the circle, then drag, then drop indicating the radius of the circle.

   d. The fill and no fill buttons select before drawing rectangles and circles if they are a solid color or no fill (the shape is hollow). If it is not selected, no fill is used automatically.

   e. The pen button is used to draw a single pixel at a time. Dragging the mouse while the pen button is selected draws a continuous shape.

   f. The text button writes characters using the keyboard. The user selects a place in the canvas to write by simply clicking. Then the keyboard is used the write characters in the chosen position.

   g. The undo button deletes the last drawn shape.

4. Any drawn shape is not erased from the canvas except using the Undo button.
5. Below the buttons, there is the canvas (drawing area). No shape could be drawn outside that area.
6. The color of any selected button must be changed after clicking. And when the mouse hovers over any button, the button's color must be changed to a different color, as seen in figure 2.
7. If two shapes are overlapped, the recently drawn must reside on the top.

Figure 2 - Example of a button when clicked (left), and the same button when the mouse hovers over it (right).