TCSS 305 Programming Practicum  
Assignment 6C – Paint

# Part C Due: Friday, 6 December

### Program Description:

You will add new features to your Paint program.

All part A and part B requirements are still in effect. Part C includes the changes described below.

### GUI Appearance:

The paint program will have the following new features:

* A ‘Background…’ Item added to the Options menu. This will be used to set a background color.
* An ‘Undo’ button added to the toolbar.

Below is a screen shot showing the new features:

|  |  |
| --- | --- |
| *GUI with Options menu open:* |  |
|  |  |

The window should have a menu bar with the following items.

Options

Thickness (a submenu containing a JSlider with the following properties:

The slider's minimum value is zero; the slider's maximum value is 25.

The slider has major tick marks (with labels) at increments of 5

The slider has minor tick marks at increments of 1

The initially selected thickness is 5. Changing the thickness affects future drawn items but not those that are already drawn. (If thickness = 0, the drawing tools should draw at thickness = 1.)

~~---~~ (separator)

Color… A menu item which invokes a color chooser dialog.

**Background… A menu item which invokes a color chooser dialog.**

~~---~~ (separator)

Clear (removes all drawn shapes)

NOTE: this menu item should be disabled when there are no shapes to 'clear'

Tools

Line (a radio button item; selects the line tool)

Rectangle (a radio button item, selects the rectangle tool)

Ellipse (a radio button item, selects the ellipse tool)

Pencil (a radio button item, selects the pencil tool)

Help

About... (pops up an option pane with the following title:

**TCSS 305 Paint**

and with the following message:

**<Your Name>**

**Autumn 2024**

You may add other information to this message if you wish.

The Icon shown on this message should match the one on the JFrame, but you may use a different size icon if you wish.)

### Implementation Guidelines and Hints:

The ‘Background…’ menu item should invoke a JColorChooser which can be used to select a background color for the drawing panel. The initial color of the drawing panel should be white (as it was for parts A and B of this assignment. The color chooser invoked by the ‘Background…’ menu item should not be the same color chooser object that invoked by the ‘Color…’ menu item. The reason for this is that color chooser for ‘Background…’ should display the current background color and the color chooser for ‘Color…’ should display the current drawing color.

Add an ‘Undo’ button and a separator to the toolbar to the left of the tool buttons. (The ‘Undo’ should be a JButton, not a toggle button.)

Each time the ‘Undo’ button is pressed the most recently draw shape should be removed from the drawing panel. If ‘n’ shapes have been drawn, then pressing the ‘Undo’ button ‘n’ times should remove all shapes.

The ‘Undo’ button should appear disabled initially.

When we draw any shapes then the ‘Undo’ and ‘Clear’ should be enabled.

If we ‘Undo’ all shapes or if we ‘Clear’ all shapes, then ‘Undo’ and ‘Clear’ should be disabled.

If we later draw new shapes, then ‘Undo’ and ‘Clear’ should be enabled again.

### Submission and Grading:

For Part C, all part A and part B requirements are still in effect. The requirements described in this document include modifications and additions to the previous assignment requirements.

When you are finished with Part C, commit your project and an executive summary on Canvas. The required filename for the Part C executive summary is “**username-assignment5-c.txt**”, where username is your UWNetID. As on previous assignments, executive summaries will *only* be accepted in plain text format.

The external correctness of your Part C submission will be graded on the GUI's behavior, which is observed by running the GUI, clicking various buttons, attempting to draw various shapes, and examining the result. Your GUI should match the expected layout and should be positioned, sized, and resize identically to expectations. Exceptions should not occur under normal usage. Your program should not produce any console output.

Internal correctness of Part C will be based on following the program specification, inclusion of reasonable comments, the use of meaningful identifier names, encapsulation, and the avoidance of redundancy. In addition, the output of the plugin tools will be used for Part C.

For Part C, the percentage breakdown is 10% executive summary, 60% external correctness, and 30% internal correctness.