

Project ideas for 15-112

Arabesque

The idea

A special purpose drawing program that specializes in highly symmetric drawing. The program allows you to design beautiful artistic decorations and combine designs to form amazing pieces of art.

The program consists of two parts: a drawing window where the building block of one layer is drawn. General drawing can be done here too. It features the common functionalities of a lightweight drawing and painting program. The canvas here can be either rectangular or triangular depending on template.

The second part or the main canvas creates designs from combining layers where each layer is formed from repeating one building block several times symmetrically in a rectangular form or in a polar form. Symmetry can be rotational, reflective, translational or a combination of these. The program features templates for layer symmetry like: "polar layer with 6 lines of symmetry."

The program makes use of complex algorithms to draw Bezier curves and add the effect of transparency on layers when combining them.

Libraries:

- Tkinter
- PIL
- Math

Features list:

Part One: Drawing:

- Free-form line
- polygons
- circle
- arc
- Bezier curves
- fill color
- pen width
- pen color
- color picker
- eraser
- draw text

Part two: main canvas:

- multiple layers
- combine layers with pseudo-transparency (paint-like)
- transform layers individually
- resize canvas
- export as image
- Importing pictures from local disk

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Types of layers (templates):

- 1.
2. Free drawing
3. Polar form with n lines of symmetry
4. Polar form with n degrees of rotational symmetry
5. Simple linear with n blocks
6. Linear with n blocks, each with one line of reflection

When program starts the main-canvas windows is started with one blank layer. No drawing tools are on the main canvas window. The user clicks on add layer, then a new window pop-up. It asks the user to choose a template. When OK is pressed, a drawing window is created and the user draws there the building block of the layer. When finished and OK presses, the drawing window closes and the drawing is transformed to form the design of the template. The user can then move that layer around, add layers and transpose them.

Checkpoint 1:

Part one: a drawing program that returns an image when closed complete with features.