COSC 1P02 Assignment 2

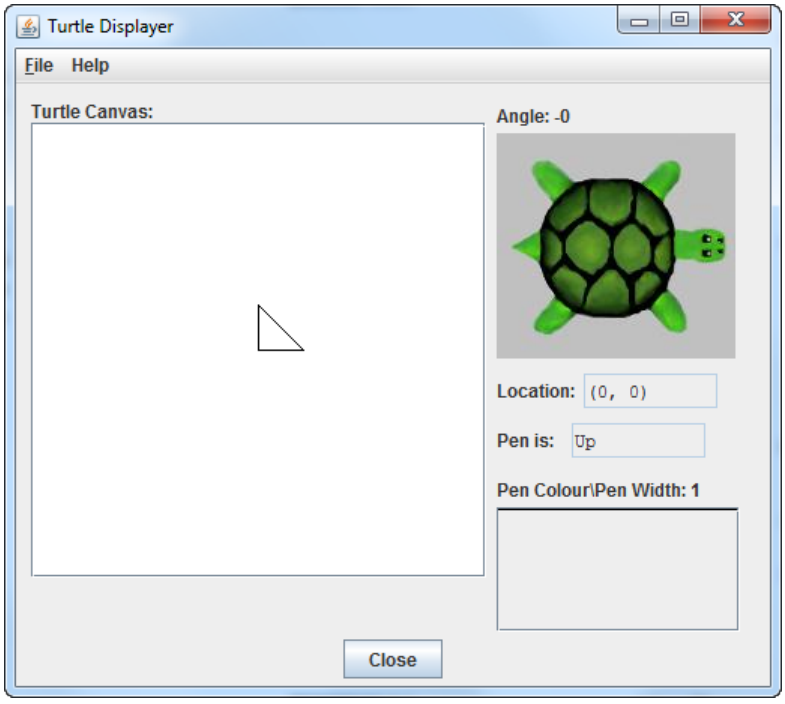
"I think I had a kitchen floor like that in the 70s"

***Due: Oct. 5, 2018 @ 4:00 pm** (late date Oct. 9 @ 4:00 pm)*

The emphasis in this assignment is to use methods to build (compose) a complex pattern from constituent parts. In preparation for this assignment, create a folder called `Assign_2` for the DrJava project for the assignment. The problem is described in four parts however, you only submit the final solution from Part D. The file `MethodTemplate.txt` in the assignment folder is a skeleton of a Java program using Turtle Graphics and methods and can be copied and pasted as a starting point for your program.

Part A

As part of a package called `Assign_2`, write a Java class called `Cover`. For the first part, the class will draw an isosceles triangle on the display as shown below.

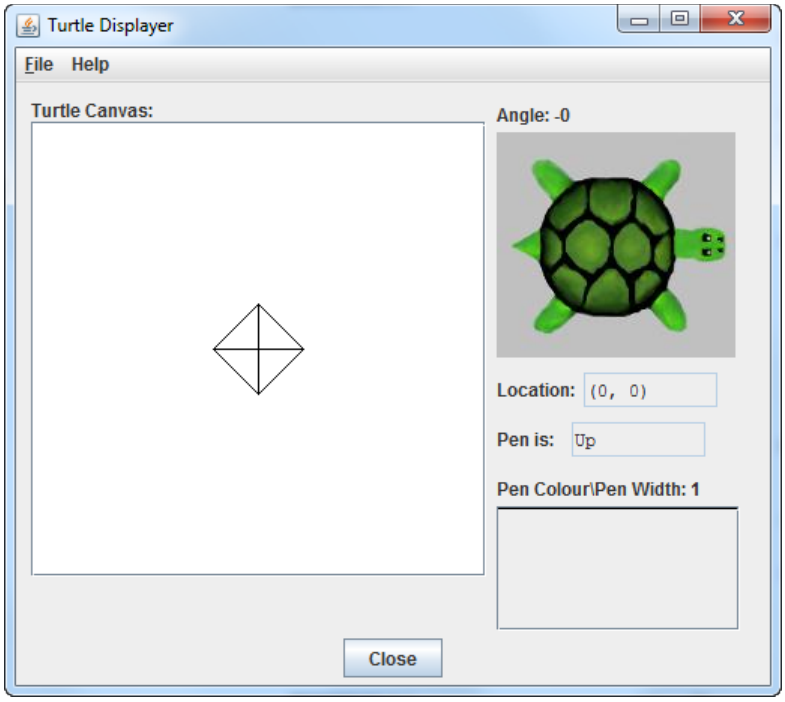


Write a method called `drawTriangle` to draw the actual triangle. The triangle has two sides of length 30 making the hypotenuse $\sqrt{1800}$. Drawing from the center of the canvas, the exterior angle between the sides at the right vertex and top vertex are $3\pi/4$ and the exterior angle between the sides at the bottom vertex is $\pi/2$. To make the Part B easier, make sure leave the turtle back where it started (i.e. at center facing right).

Part B

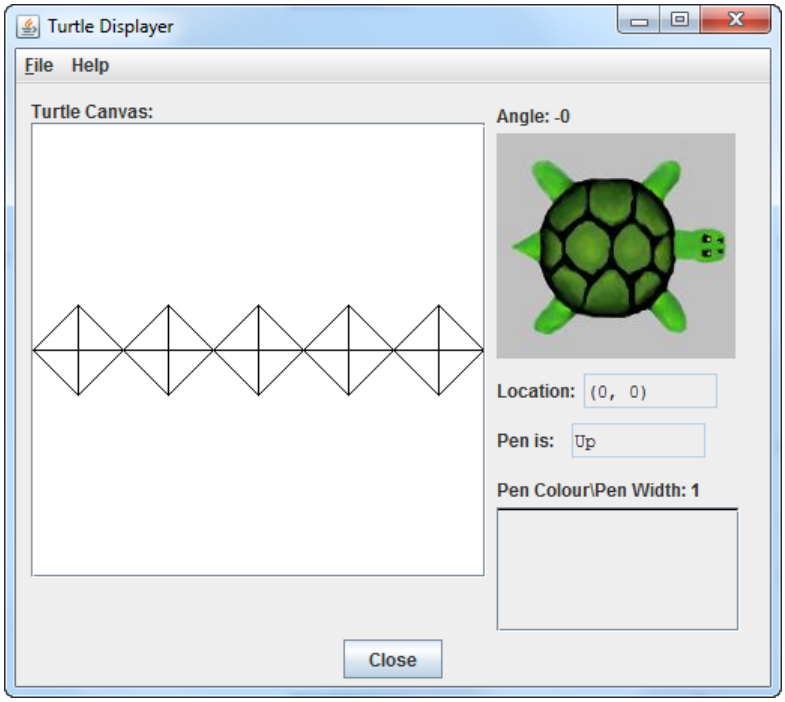
As the second part of the assignment, modify the `Cover` class written in Part A so that it draws a patch (diamond-shape) as seen below.

Write a method `drawPatch` that draws the patch using the method `drawTriangle` from Part A. The patch consists of 4 triangles, equally spaced, drawn from the center of the canvas. Again, to make the Part C easier, be sure to leave the turtle where it started.



Part C

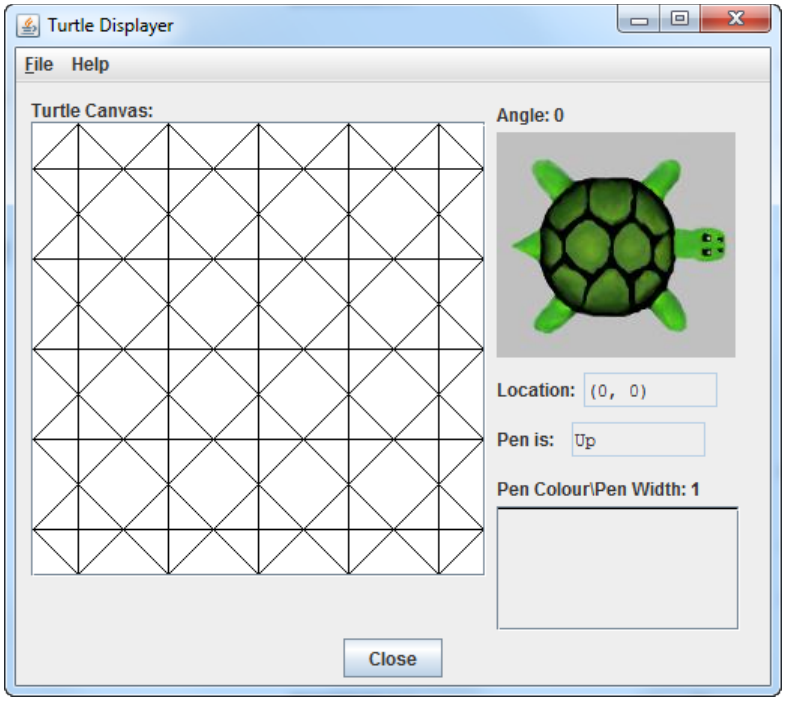
As the third part of the assignment, modify the `Cover` class written in Part B so that it draws a row of patches as seen below:



Write a method `drawRow` that draws the row using the method `drawPatch` from Part B. The row consists of 5 patches. To make the Part D easier, be sure to leave the turtle where it started.

Part D

As the final part of the assignment, modify the `Cover` class written in Part C so that it covers the canvas with rows of patches as seen below:



Write a method `drawCover` that draws the covering using the method `drawRow` from Part C. The covering consists of 5 rows. Since the cover consists of a lot of lines, draw it using a FAST `Turtle`. (See Lab 3).

Suggestions:

- The separation into multiple methods is mandatory—for a good reason. Build up the program as outlined above rather than trying to get the final result. Procedural abstraction allows you to ignore the details of say how the row is drawn, when writing the code to draw the cover.
- To make procedural abstraction effective, it is necessary to know where the turtle starts drawing and where it ends up after each method (e.g. after `drawRow`). Then all you have to do in `drawCover` is make sure you put the turtle where desired after each row.

Submission:

Details regarding preparation and submission of assignments in COSC 1P02 are found on the COSC 1P02 Sakai Site as `Assignment Guidelines` under `Course Documents`. This document includes a discussion of assignment preparation, programming standards, evaluation criteria and academic conduct (including styles for citation) in addition to the detailed assignment submission process copied below.

To prepare and submit the assignment electronically, follow the procedure below:

1. Ensure your folder (say `Assign_2`) contains the DrJava project for Part D of the assignment.
2. Using DrJava, print (as a pdf file, e.g. using "printer" `Microsoft Print to PDF` or similar) the `.java` file for Part D for your assignment using the name *`ClassName`*`.pdf` where *`ClassName`* is the class name (i.e. same name as the `.java` file) and save the `.pdf` file at the **top level** of the assignment folder (i.e. directly within `Assign_2`).

3. Run the program for Part D. When the display is finished (i.e. `Close` button visible), select `Print Image of Window...` from the `File` menu on the `TurtleDisplayer` and direct the output to `Microsoft Print to PDF` and saving the `.pdf` file at the **top level** of the project folder using an appropriate name (e.g. `Output.pdf`).
4. Create a `.zip` file of your submission by right-clicking on the top level folder (i.e. `Assign_2`) and selecting `Send to/Compressed (zipped) folder`. A zipped version of the folder will be created. Use the default name (`Assign_2.zip`).
5. Log on to Sakai and select the COSC 1P02 site.
6. On the `Assignments` page select `Assignment 2`. Attach your `.zip` file (e.g. `Assign_2.zip`) to the assignment submission (use the `Add/Rremove Attachments` button and select `Browse`). Navigate to where you stored your assignment and select the `.zip` file (e.g. `Assign_2.zip`). The file will be added to your submission. Be sure to check the `Honor Pledge` checkbox. Press `Submit` to submit the assignment. You should receive a confirmation email.

DrJava

The `.zip` folder you submit should contain the project folder for Part D, including all files relevant to the project—the `.drjava`, `.java` and `.class` files for the assignment and `.pdf` files for program listings and output.

Other Platforms

If you are using an IDE other than DrJava to prepare your assignment, you must include the `.java` source files and the `.pdf` files described above as well as a file (likely `.class` or `.jar`) that will execute on the lab machines.