Lab 5

Learning Objectives

- Use the textbook author's graphics package.

Activities

Complete the following activities in the provided Python file. Make sure to include meaningful comments, input prompts, and output messages to receive full credit.

1. Unit conversion

   The provided function `converter()` creates a simple user interface in a graphics window. Modify this function to ask the user to input a number of kilometers, and then display this number converted to miles. All input/output should be through the graphics window. You may look up any relevant unit conversions.

2. Archery target

   Write a function `target()` that draws an archery target in a graphics window. An archery target consists of a yellow circle surrounded by concentric rings of red, blue, black, and finally white. The width of each ring is the radius of the yellow circle. The target should fill the window, and the window should remain open until the user clicks on it. Include a message instructing the user to click to close the window.

   Tips:
   - Graphical objects drawn later will appear on top of objects drawn earlier.
   - You can look up images of archery targets as a visual reference, but note that you don't need to draw any extra borders or lines that appear on those targets.

3. Construction map

   Your company is planning the construction of two new complexes in North Charleston. Your boss wants to get a rough idea of what the new complexes may look like on the map at different locations. Examine the provided function `map_plan()`, which draws an overhead map, and then extend the function with the following features:

   1. Let the user click twice to draw a red rectangle (complex #1) on the map. Use the click points as the corners of the rectangle.

   2. Repeat step 1 to allow the user to draw a second, blue rectangle (complex #2).

   3. After both rectangles are placed, draw a line between the centers of the two rectangles. In the middle of the line, display its length in miles (50 pixels = 1 mile). Recall that you can use the [Euclidean distance formula](#) to find the distance between two points, and the [midpoint formula](#) to find the center of two points.

   4. Before steps 1 and 2, display an instruction to the user to click to draw the complexes. After step 3, display an instruction to click to close the window.

Upload `lab5.py` to the OAKS dropbox before the deadline. Make sure you have most of the exercises completed before your lab meeting.