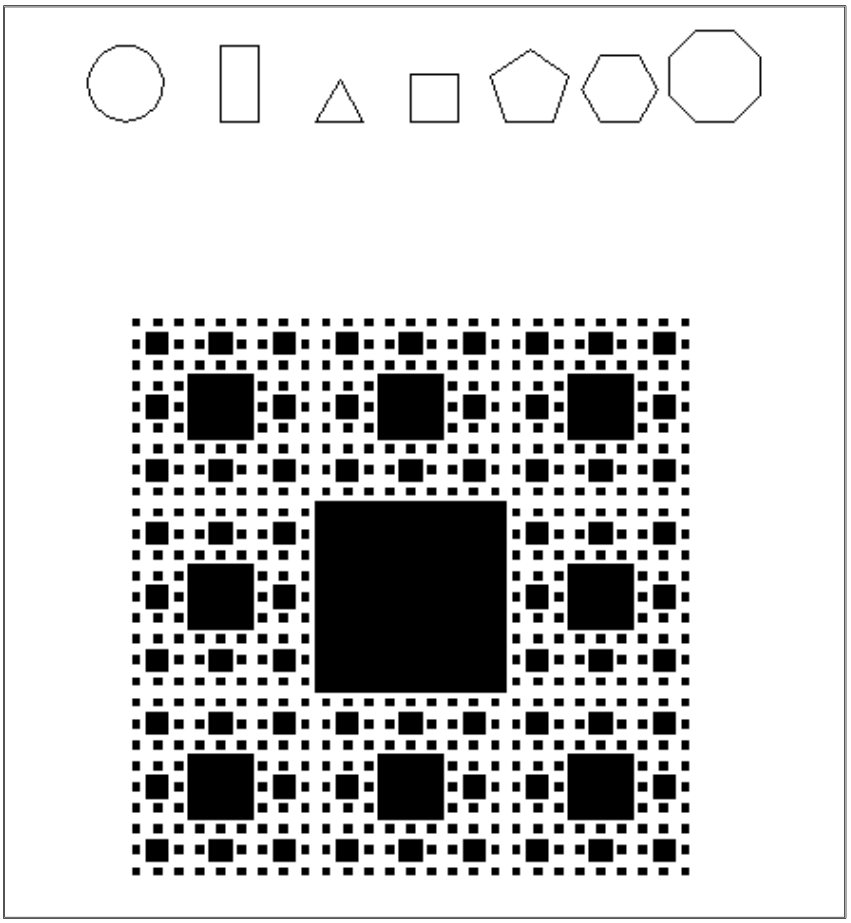
Fall 2013 CSCI2961: Programming in Python Homework 1

Part 1: Turtle Graphics

Using the standard Python turtle package,

1. Define a function, turtleRectangle(x, y, width, height), that draws a rectangle with the specified width and height.
2. Define a function, turtlePolygon(x, y, nside, sidelength), that draws a polygon at the specified position. The sidelength parameter specifies how long each side should be; the nside parameter specifies the number of sides.
3. Define a function, turtleSierpinskiCarpet(x, y, width), that draws a Sierpinski carpet (see: en.wikipedia.org/wiki/Sierpinski_carpet for details).
4. Define a function, turtleShapes(), that draws a circle, rectangle, triangle, square, pentagon, hexagon, octagon, and a sierpinski carpet. This function should make use of your turtleRectangle(), turtlePolygon() and turtleSierpinskiCarpet() functions. An example screen shot of the potential output of your turtleShapes() function is shown below.



Part 2: Addition Quiz

Define a function, additionQuiz, that consists of an interactive loop. Within the loop

1. Generate a one digit addition problem (e.g. "2 + 5")
2. Display the problem to the user
3. Prompt the user for a response
4. Provide feedback to the user to indicate whether or not the response is correct.

The loop should repeat these steps until the user enters a blank response.

An example session is shown below:

```
>>> additionQuiz()
Starting Addition Quiz...

3 + 2 =
? 5
Correct!

6 + 8 =
? 14
Correct!

0 + 6 =
? 17
The correct answer is:  6

4 + 9 =
? 36abc
Invalid number!

2 + 3 =
? 5
Correct!

0 + 1 =
?
>>>
```

General homework submission policies

This homework assignment is to be completed individually. Do not share code or review anyone else's code. Work on this assignment is to be your own.

Submit your homework via RPILMS before midnight on the due date. Put all of your code into exactly one Python file and name it with the homework number followed by an underscore, followed by your RCS userid. For example, if your RCS userid is mehtaa2, then your Python file name for your first homework assignment must be hw1_mehtaa2.py. In all homework submissions, your submitted file must use the clause

```
if __name__ == "__main__":
```

to conditionally execute any code that you are actively testing or want to demonstrate. This will allow the TA to import your module *without* starting the execution immediately and will allow for the evaluation of your submission using different test cases and code that was not written by you.

For example, the following code will cause your `additionQuiz()` function to be called when your program is executed.

```
if __name__ == "__main__":
    additionQuiz()
```

Pay attention to the naming conventions and function signatures that are specified in your assignment. You will lose points if your function names do not match specifications. For example, in hw1, the specifications ask you to define a function, turtleRectangle(x, y, width, height). The correct signature for this function is:

```
def turtleRectangle(x, y, width, height):
    # your implementation goes here
```

The following example definitions are <u>not</u> the same, and would lose points:

```
def turtle_rectangle(x, y, width, height): ...
def TurtleRectangle(x, y, width, height): ...
def turtleRectangle(x, y, w, h): ...
```

You are free to define and use additional helper functions, variables, modules, classes, etc. to construct your solution, as long as the functions explicitly requested in the assignment are defined and complete the tasks requested in the specifications.

Make sure you document your code and follow Python “pep8” style conventions.