Computer Science — Python — HW #4

Assigned on Wed, 2017-02-01. Due on Tue, 2017-02-~~07~~ 14.

The current means of turning in assignments is to email them to [jay.coskey@xxxx.xxx](mailto:jay.coskey@nyhs.org).

1. Read chapter 2 of Think Python, 2nd ed.
2. **[Turn in]** Write three small scripts. **Please submit them as email attachments.**
   1. **Script name:** counter.py.
      * Let print\_char\_count be a function that takes a string argument, and prints out the distribution of characters in that string. Have this function convert its argument to lower case, so that the arguments 'abcdABCD' and 'aabbCCDD' yield the same output.
      * Write a script that calls this function with the word “masslessness”.
      * Submit both the script and its output.
   2. **Script name:** reachone.py
      * Let f be the function that takes a positive integer n, and returns a value depending on this rule:

If n is even, then f(n) = n / 2

If n is odd, then f(n) = 3 \* n + 1

* Note that if you start with any positive integer, and apply f repeatedly, that you will eventually arrive at the value 1. For example, if you start with n = 17, you get the values 52, then 26, then 13, 40, 20, 10, 5, 16, 8, 4, 2, 1. So, if you start with n=17, then you arrive at 1 after 12 applications of f.
* Let g be the function that takes a positive integer, n, and returns the number of applications of f it takes to arrive at 1. So, for example, g(17) = 12. Write a Python script that defines the function g, and prints out the value of g(5777).
* Submit both the script and its output—the value of g(5777).
* (Feel free to choose more descriptive names than f and g, if you'd like.)
  1. **Script name:** pascal.py

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| Pascal's triangle is a triangle formed as shown in the diagram to the right, with centered rows of increasing length. The top row is called Row #0, the next is called Row #1, etc. Row #<n> has n+1 items.  The first and last items in each row equal one. Items in-between are the sum of the item directly to the "northwest" and the item directly to the "northeast". |  |

Write a Python script that uses two nested loops to print out the first seven rows (Row #0 through #6) of a comma-separated version of Pascal's triangle, with every row being left-aligned, like so:

1

1,1

1,2,1

1,3,3,1

1,4,6,4,1

1,5,10,10,5,1

1,6,15,20,15,6,1