Programming Project 05

This assignment is worth 40 points (4.0% of the course grade) and must be **completed and turned in before 11:59 on Monday, February 16th 2009.**

Assignment Overview

The goal of this project is to gain more practice with List. In Python, the List type is a container that holds a number of other objects, in a given order. This data structure is so useful and powerful that you can find it in almost every algorithm.

In this project, we want to generate a Pascal's triangle. You can get the detailed explanation from Wikipedia (http://en.wikipedia.org/wiki/Pascal's_triangle), and the figure below is a simple Pascal's triangle whose height is 7.

<div align="center">

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

</div>

You are going to write a program that asks for the height of Pascal's triangle, then generate the triangle and output it in the same style as above example.

Project Specification

1. Your program will ask the user to input a positive number that will be used as the height of triangle. Check for this condition
2. To generate the triangle, you start from the first row, which is always 1, and the second row which is always 1 1.
3. After the first two rows, each row at level h is generated from the values at row h-1. Note that the leftmost number and the rightmost number in any row are always 1. Note that, in row h, there are h numbers.
4. We will use a list to represent a row. Because the triangle consists of multiple rows, We will require another list to hold all the lists that makes the triangle rows. Thus, we will have a list of lists.
5. Output: This is the example output in IDLE:

```
Python Shell - C:/Users/Yang/Desktop/CSE231TA/output.jpg                    [_][□][✕]

File  Edit  Debug  Options  Windows  Help

Python 2.5.1 (r251:54863, May  1 2007, 17:47:05) [MSC v.1310 32 bit (Intel)] on win32
Type "copyright", "credits" or "license()" for more information.

    ****************************************************************
    Personal firewall software may warn about the connection IDLE
    makes to its subprocess using this computer's internal loopback
    interface.  This connection is not visible on any external
    interface and no data is sent to or received from the Internet.
    ****************************************************************

IDLE 1.2.1      ==== No Subprocess ====
>>>
Please input the height of Pascal's Triangle: 7
       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
>>>
Please input the height of Pascal's Triangle: 10
          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
   1 7 21 35 35 21 7 1
  1 8 28 56 70 56 28 8 1
 1 9 36 84 126 126 84 36 9 1
>>>

                                                              Ln: 33 Col: 4
```

You can output any sentences in your program, but make sure your triangle looks similar to the example.

Deliverables

proj05.py – your source code solution (remember to include your section, the date, project number and comments in your program).

1. Please be sure to use the specified file name, i.e. "proj05.py"
2. Save a copy of your file in your CSE account disk space (H drive on CSE computers).
3. You will electronically submit a copy of the file using the "handin" program:
    http://www.cse.msu.edu/handin/webclient

Project Notes

1. The string method center will center a string within the indicated width. Thus 'abc'.center(50) will center the string 'abc' with blanks to a width of 50.
2. A list which has list as elements is no different than another list. One can:
    a. myList.append([1,2,3]) to add a list to the list
    b. myList[0] which yields a list