CSC 104 Assignment 2, Winter 2012

Due by the end of Wednesday February 29, 2012; no late assignments without written explanation.

1. Examine the names of some of the items in the menus one finds at the top of the windows of application programs on the CDF Linux computers. For example, in the ‘‘nedit’’ text editor there is a ‘‘File’’ menu with entries ‘‘New’’, ‘‘Open...’’, ‘‘Open Selected Filename’’, ‘‘Revert’’, ‘‘Close’’, ‘‘Save’’, ‘‘Save As...’’, and so on.

Some of these names end with an ellipsis (three dots) and some do not. What is the meaning of this ellipsis? Answer in a file named ‘‘q1’’. (Note: The ellipsis has a very precise meaning, although it’s possible that some programs incorrectly have or do not have an ellipsis on some menu items’ names—ask me if you want to confirm whether a particular one is erroneous.) (Hint: The ‘‘Save’’ item is anomalous and you might be best to ignore that particular item when investigating this issue.)

2. Note how there are often ‘‘shortcut’’ keys listed in these menus. For example, in the ‘‘nedit’’ text editor, in the ‘‘File’’ menu, the ‘‘Open...’’ command says that it can also be selected by pressing Control-O (hold down the Control key (like a shift key) and press the ‘O’ key).

How does this interact with the Xerox Star design principle of ‘‘seeing and pointing rather than remembering and typing’’? Answer in a few sentences or point-form notes, in a file named ‘‘q2’’.

3. ‘‘Squaring’’ a number is multiplying it by itself. Recall that the multiplication operator in Python is an asterisk (‘`*`’). Write a program which outputs the following, in which the numbers after the ‘‘23’’ are calculated (not copied by you from this assignment sheet):

```
I like the number 23
That number squared is 529
And that number squared again is 279841
```

Call your program file ‘‘calc.py’’.

4. Write a program named ‘‘story.py’’ to produce a short story based on user input. The user input part will look like this, where computer-output prompts are alternating with user inputs:

```
What is your name?
Sally
Are you a woman or a man?
woman
How old are you now?
18
At what age did you or will you first travel in an airplane?
17
```

After the successful input above, your program outputs a story which looks like this, with appropriate substitutions based on the input (you have to subtract the ages to get the number which is 1 below, and don’t worry about the fact that it says ‘‘years’’ where in English it should say ‘‘year’’, nor about the space before the period on the first line):

```
This is a story about a woman named Sally .
1 years ago Sally first took an airplane.
The end.
```

You need to use an ‘if’ statement to state correctly whether the date is in the past or future. If Sally had answered ‘20’ for the last question, the output would instead say ‘‘In 2 years Sally will first take an airplane.’’

5. Write a program named ‘‘count.py’’ to count from 1 to 10 using a loop. Its output will look like this:

```
1
2
3
4
5
6
7
8
9
10
```

Numbers such as 1 and 10 (or 11) will appear in your computer program, but the numbers inbetween should not.

(over)

6. Copy the file ‘‘stars.py’’ from /u/ajr/104/a2/stars.py on CDF, and run it and examine it. ‘‘sys.stdout.write’’ is used to output a single character, without a newline. Then the ‘‘print’’ command by itself outputs the newline.

Modify this program to make the triangle be ‘‘right-justified’’. That is, instead of this output:

```
*
**
***
****
*****
******
*******
********
*********
```

your version will have this output:

```
        *
       **
      ***
     ****
    *****
   ******
  *******
 ********
*********
```

This is accomplished by printing an appropriate number of spaces to the left of the first asterisk. The formula for the appropriate number of spaces is `9-i`.

Also, modify the program to prompt for and input the number of stars in the largest line. This is currently hard-coded as 9. (Note that in the current version of the program, to get a maximum of 9 stars, the number which actually appears is 10. Therefore in your version, adding one to the user input will be involved.)

Here is an example session with your completed program, in which the user types the ‘5’:

```
How many stars?
5
    *
   **
  ***
 ****
*****
```

Submission

Questions 1 and 2 will be answered by submitting text files on-line. You can use ‘‘nedit’’ to create your text files; if you create them using some fancier program, please use ‘‘cat’’ to verify that the files are plain text.

Use the file names ‘‘q1’’ and ‘‘q2’’ for your answers to the first two questions.

The subsequent four questions will be answered by submitting python programs on-line. I recommend using ‘‘Wing-101’’ to compose (and test) your python programs. The file names must be calc.py, story.py, count.py, and stars.py.

The submission commands are similar to those for the labs and assignment one; use ‘‘-a a2’’. Example commands:

```
submit -c csc104h -a a2 calc.py story.py count.py stars.py q1 q2
submit -c csc104h -a a2 -f story.py
submit -l -c csc104h -a a2
```