CS1110 Lab 4: Practice for A3 (Mar 1-2, 2016)

First Name: _____ **Last Name**: _____ **NetID**: _____

The lab assignments are very important. Remember this: *The lab problems feed into the assignments and the assignments define what the exams are all about.*

Start *before* your lab meets.

We recommend spending an hour or two on the lab *before* coming to your section, so you can use your in-person time to ask questions most efficiently.

Also, this strategy of starting beforehand increases your chances of checking in at your lab section, which will probably take less time than waiting in line at consulting hours!

Getting credit

Complete all required blank boxes and lines on this handout. When you are finished, show your written answers to one of the CS 1110 lab staff in <u>your</u> section on March 1-2 or in any consulting hours up to and including March 7 (earlier days will probably have shorter lines). The staff member will ask you a few questions to make sure you understand the material, and then swipe your Cornell ID card or directly make a notation in CMS to record your success. This physical piece of paper is yours to keep.

Getting set up

From the Lab webpage, download `SimpleGraphics.py` and `ShowForGraphics.py` into a folder (say) `Lab_4`. In the command shell, navigate the file system so that this folder is THE CURRENT WORKING DIRECTORY.

1   String Methods

Assume that `s = 'February 16, 2016'`

	Expression	I Think the Value Is	Python Says	Notes
1	`s.count('1')`			
2	`s.find('f')`			
3	`s.replace(' ','/')`			
5	`s[s.find('16')]`			

2 Boolean Things

1. Suppose `s1` and `s2` are non-empty strings. Why is the Boolean expression

$$\texttt{s1.find(s2)>0 and s2.find(s1)>=0}$$

always `False`?

2. Rewrite this function so that it does exactly the same thing but has just one `return` statement. You may assume that `B1`, `B2`, and `B3` are Boolean-valued.

```
def f(B1,B2,B3):
    if B1:
        return 1
    elif B2:
        return 2
    elif B3:
        return 3
    else:
        return 4
```

3 Loops of the form `for c in s`

1. Without using the computer, what would be the output if the following script is run?

```
s = 'abcd'
t = ''
for c in s:
    t = c + t + c
print t
```

2. Correct the implementation of this function so that it lives up to its specification. Do this without using the computer and no fair using the string method `count`!

```
def MyCount(x,S):
    """Returns an int that is the number of times x occurs in S

    PreC: x is a character and S is a string
    """
    for c in S:
        if x==S:
            N = N+1
            return N
```


3. Assume that `S` is a string. Describe (in English) what the following script prints if it is run. Hint: Hand execute with some simple examples like `S = 'a'` and `S = 'abcde'`.
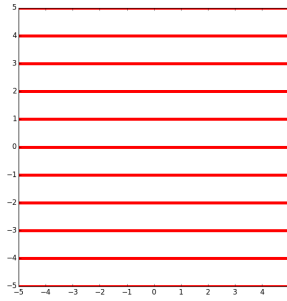
```
k = 0
T = ''    # The empty string
for c in S:
    if k%2==0:
        T = c + T
    k = k+1
print T
```
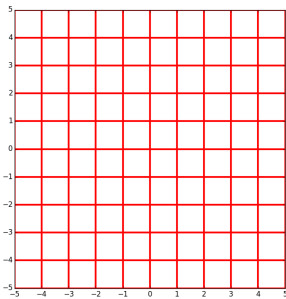

4 Graphics with For-Loops

In the following problems, color is not important. Start by taking a look at `ShowForGraphics.py`.

4.1 Grid Lines

If you run `ShowForGraphics` you will see that it produces a bunch of horizontal grid lines:

Add a `for`-loop `ShowForGraphics.py` so that it also draws vertical grid lines. Put copy of your loop in the box.

4.2 Border Stars

A border star has radius 0.5 and is centered in a box that is on the border of the window. Add a single loop to `ShowForGraphics.py` so that it also draws all possible border stars. Put a copy of your loop in the box.