CSC241 Winter 2014 - Lab Assignment 3

1 Program 1 (2 points)

The DNA of living creatures consists of a double helix of four types of nucleotides, commonly referred to ATGC. They came in pairs A-T, T-A, G-C, C-G. This means that a ATGC sequence of one strand corresponds to the TACG on the other strand. Write a program that given one strand of DNA, in the form of one input string, computes the complementary strand. For example:

```
input: ATGCATGC
output: TACGTACG
```

The program file must be called `a3p1.py`
When done you can grade it automatically with

```
$ grade a3p1.py
```

2 Program 2 (2 points)

Consider a chessboard. Each cell in the chessboard has two coordinates (x,y) for example (0,0), (0,1),(1,1),(2,3),etc. Now consider a simple game where you start on cell (0,0). The game repeatedly asks you to input a string. If you input U it moves up (x=x+1), if you input D it moves down, if you input L it moves left (y=y-1), if you move input R it moves right, and if you input Q it prints the coordinates of the cell where where you are, in the form "(4,5)" (notice brackets but not spaces).

```
input: U
input: U
input: U
input: L
input: Q
output: (3,-1)
```

The program must be called (`a3p2.py`)
When done you can grade it automatically with

```
$ grade a3p2.py
```

3 Program 3 (2 points)

Write a program (`a3p3.py`) that inputs a string and prints 'True' if the world is a palindrome, 'False' otherwise.

```
$ grade a3p3.py
```

4 Program 4 (2 points)

Write a program (`a3p4.py`) Which contains the following code:

```
def getMetamorphosis():
    return open('/tmp/kafka.txt').read()

def countWord(s, p):
    counter = 0
    for k in range(0,len(s)-len(p)):
        # FILL HERE
    return counter

print(countWord(getMetamorphosis(), 'Gregor'))
```

This program is supposed to count the number of instances of the word "Gregor" in Kafka's Metamorphosis. Complete the body of the function countWord.

```
$ grade a3p4.py
```