CS 1200 SP19 Homework 1

Due 2019-02-04 (Monday) at 11:59 PM

Submit your assignment to Canvas:

1. A PDF file that contains all the answers to the individual questions, all pictures, all code, and all code output. This should all be well-organized. Points will be deducted for sloppy or disorganized work.

2. All the Python codes (.py file) (You may put all codes in one .py file).

If you need a program that helps you put PDF files together into a single PDF file, try http://www.pdfsam.org/. The program there is open source and available for free.

1. (35 points) Simple questions about Python.

   (a) (16 points: two points each) Let text="Hello CS1200".

   - i. What is text[0]?
   - ii. What is text[-1]?
   - iii. What is text[0:4]?
   - iv. What is text[2:8:2]?
   - v. What is text[::-1]?
   - vi. What is text[:]?
   - vii. What is text[:3]?
   - viii. What is text[9:3:-2]?

   (b) (5 points) Given the following function :

```
def daynumber(n):
    if n == 0:
        print("Today is Sunday!")
    if n == 1:
        print("Today is Monday!")
    if n == 2:
        print("Today is Tuesday!")
    if n == 3:
        print("That is Wednesday!")
    else:
        print("Sorry, I do not know.")
```

What will be displayed by the call daynumber(2)?

(c) (6 points) Trace the output of the following program:

```
for a in ["x", "y"]:
    for b in [2, 5]:
        print(a*b, end=" ")
```

(d) (4 points) Given the following program:

```
a = ["Good", 2]
b = []
b.append(a)
b.append(a)
a.append(7)
```

What are a and b?

(e) (4 points) What will be displayed by the following code?

```
def f1(x = 1, y = 2):
    x = x + y
    y += 1
    print(x, y)

f1()
```

2. (10 points) Use a loop (for loop or while loop) to print the decimal representations of $1/2, 1/3, \ldots, 1/15$, one on each line, then calculate the sum of those numbers.

3. (10 points) Write a function called pickWord() that takes a string as its only parameter. You may assume that the string will be a single word, containing at least one letter. Your function should return a new string that represents the pickWord version of the word. To do this, remove the first letter, add it to the back of the string, and add "ay" after it. Return this new string. Example test cases:

```
>>> x = pickWord("Run")
>>> print(x)
unRay
>>> y = pickWord("a")
>>> print(y)
aay
```

4. (15 points) If you are given three sticks, you may or may not be able to arrange them in a triangle. For example, if one of the sticks is 12 inches long and the other two are one inch long, it is clear that you will not be able to get the short sticks to meet in the middle. For any three lengths, there is a simple test to see if it is possible to form a triangle:

If any of the three lengths is greater than the sum of the other two, then you cannot form a triangle. Otherwise, you can. (If the sum of two lengths equals the third, they form what is called a "degenerate" triangle.)

(a) Write a function named isTriangle that takes three integers as arguments, and that prints either "Yes" or "No," depending on whether you can or cannot form a triangle from sticks with the given lengths.

(b) Write a function that prompts the user to input three stick lengths, converts them to integers, and uses isTriangle to check whether sticks with the given lengths can form a triangle.

5. (10 points)Write a Python function called altDiff that produces the alternating difference of a list of numbers. For example,altDiff([17, 5, 8, 10])=17-(5-(8-10))=17-(5-(-2))=17-7=10; altDiff([6, 8,7])= 6 - (8 - 7) = 5 - 1 = 2; altDiff([4, 5]) = 4-5 = -1.