2013 BHCSI Introduction to Python
Test #2 (100 points) Solutions
7/24/2013

1) (15 pts) Complete the program below so that it reads in a sentence entered on a line by itself by the user and reports the number of words in the sentence and the length of the longest word in the sentence.

```
def main():

    sentence = input("Please enter your sentence.\n")

    tokens = sentence.split()      # 3 pts
    numWords = len(tokens)         # 3 pts

    numChars = len(tokens[0])           # 1 pt
    for i in range(len(tokens)):        # 3 pts
        if len(tokens[i]) > numChars:   # 3 pts
            numChars = len(tokens[i])   # 2 pts


    print("Your sentence has", numWords, "words.")
    print("The longest word has", numChars,"characters.")

main()
```

2) (10 pts) Complete the program below so that it asks the user for a positive integer, and then prints out all numbers strictly less than it that divide evenly into it. For example, if the user entered 10, the program should print out 1, 2 and 5.

```
def main():

    n = int(input("Enter your integer.\n"))


    for i in range(1,n):      # 3 pts
        if n%i == 0:          # 4 pts
            print(i)          # 3 pts




main()
```

3) (12 pts) Complete the following function that takes in a list of numbers and returns the product of all of the numbers in the list.

```
#Takes a list of numbers and returns the product
def multiply(numbers):

    product = 1                              # 2 pts
    for i in range(len(numbers)):            # 4 pts
        product = product*numbers[i]         # 4 pts

    return product                           # 2 pt
```

4) (12 pts) What will be printed out when the following code is executed.

```
def edit_list(numbers):
      numbers.sort()
      numbers.reverse()
      for i in range(len(numbers)):
            numbers[i] = numbers[i] + 1

prices = [1,8,3,4,9,11]

edit_list(prices)
for i in range(len(prices)):
      print(prices[i], end = " ")
```

12 10 9 5 4 2 (2 pts for each)

5) (10 pts) What will the following code segment print (Don't worry about ordering for the last line)?

```
x = {'Pie':'Dog', 'Bro': 'Bacon', 'John':'Asia', 'Eggs':'Ralph'}

if 'Ralph' in x:
    print("Hello Ralph!")

if 'John' in x:
    print("John is here!")

print(x['Pie'])

for i in x:
    print(i, end = ' ')
```

John is here! # 2 pts, 2 pts for not having Ralph
Dog # 2 pts
Bro Eggs John Pie # 1 pt each

6) (13 pts) Complete the function below so that takes in a meal amount (an integer) and a percentage (float in between 1 and 100), and returns an integer representing the smallest tip of a whole dollar amount that is at least the designated percentage of the meal amount. For example, the function call `getMinTip(30, 15.0)` should return 5, since 15% of $30 is $4.50.

```
import math

def getMinTip(mealAmt, minTipPerc):

    for i in range(mealAmt+1):                # 5 pts
        if i >= mealAmt*minTipPerc/100:       # 5 pts
            return i                          # 3 pts

def getMinTipAlt(mealAmt, minTipPerc):

    return int(math.ceil(mealAmt*minTipPerc/100))
    # 6 pts for expression, 4 pts for ceiling, 2 pts int
    # 1 pt return
```

7) (25 pts) Write a function that takes in two dictionaries that map items to prices and returns a new "merged" dictionary that contains each item in either dictionary. If an item is contained in exactly one of the dictionaries, keep its price as stated. If an item is contained in both dictionaries, in the merged dictionary set its price to the minimum of the two prices. Remember, you should NOT make any changes to either of the two existing dictionaries. Instead, you'll create a third new dictionary and add to it all unique items from the two input dictionaries, setting the prices as previously mentioned.

```
def makeMergedPriceList(priceListA, priceListB):

    ans = {}                                # 2 pts

    for item in priceListA.keys():          # 4 pts
        ans[item] = priceListA[item]        # 4 pts

    for item in priceListB.keys():          # 4 pts
        if (not item in ans.keys()) or priceListB[item] < ans[item]:#6p
            ans[item] = priceListB[item]    # 4 pts

    return ans                              # 1 pt
```

8) (3 pts) What items are primarily sold at Books-A-Million?

Books (3 pts)