Title	Assignment 8
Due	04-May-2012 17:00
Number of resubmissions allowed	0
Grade	**90.0 (max 100.0)**
Modified by instructor	25-Apr-2012 02:31

Instructions

This tutorial is about files and recursion.

Question 1

Write a Python program to analyse student marks read in from a file and determine which students need to see a student advisor. The students who (hypothetically!) need to see a student advisor are those with marks less than one standard deviation below the mean.

The marks file is composed of lines of text, where each line contains a student number and mark separated by a comma.

Remember that the formula for standard deviation is:

$$\sigma = \text{sqrt}\left(\left((X_0 - \mu)^2 + (X_1 - \mu)^2 + (X_2 - \mu)^2 + \ldots + (X_{N-1} - \mu)^2\right) / N\right)$$

where μ is the mean or average and each X_i is a mark.

Before the list of student names, print out the average and standard deviation with 2 decimal points of precision.

Sample File (test1.txt)

```
Alan,35
Siobhan,23
Mmberengeni,38
```

Sample I/O

```
Enter the marks filename:
test1.txt
The average is: 32.00
The std deviation is: 6.48
List of students who need to see an advisor:
Siobhan
```

Save your program as **marks.py**. Submit all source files only.

Question 2

Write a program to reformat a text file so that all lines are at most a given length. Do not break up words. Write the formatted text to a new text file.

Treat each set of consecutive non-empty lines as a paragraph - join such lines together with a single space if necessary.

Sample File (input.txt):

```
Your program should store a single row of the triangle and calculate each subsequent row
by adding a value to the values
immediately above it and to its left.  The values on each line must be space-separated.
```

Sample File (output.txt):

```
Your program should store a single row
of the triangle and calculate each
subsequent row by adding a value to the
values immediately above it and to its
left.  The values on each line must be
space-separated.
```

Sample console I/O:

```
Enter the input filename:
input.txt
Enter the output filename:
output.txt
Enter the line width:
40
```

Save your program as **reformat.py**. Submit all source files only.

Question 3

Write a program that uses a recursive function to count the number of pairs of consecutive characters in a string. Pairs of characters cannot overlap. You MUST NOT use any form of loop in your program!

Sample I/O:

```
Enter a message:
hello, Salaama
Number of pairs: 2
```

Save your program as **pairs.py**. Submit all source files only.

Mark Weighting

Question 1 : 30
Question 2 : 40
Question 3 : 30

Submission

This assignment does not accept online submissions. Contact your instructor for additional instructions.

Done