Due Date April 1, 2006 (11:59 pm) Assignment # 8

The purposes of this program are to learn abut reading data from a file and process the data. You should prompt for and read the name of a text file containing a collection of real values, then read the numbers, echo to the number to an output file, and process the numbers. Your program must carry out the statistical calculations described below, and report the results. Use functions as much as It is practical to "modularize" your program. Minimum 3 functions required:

- Report_Res() to print the final result In the format shown,
- Calc_SD_Mean() to calculate standard deviation and mean,
- Print_Header(), to print the header and get the file names from the user and report them to the calling program. More functions are OK.

Your program will:

1. Print a header and prompt the user for and reads the names of the data files (Input and output),
2. Read and echo the values and process the data to determine the maximum and minimum values entered, the mean and standard deviation,
3. Report those statistics as shown in the sample below, and
4. Close files and terminate the program

The *mean* of a collection of values is a measure of central tendency. The *standard deviation*, on the other hand, is a measure of the extent to which the values are dispersed. For a collection of n values, $x_1, x_2, x_3, \ldots, x_n$, these formulae apply:

$$\text{Sum} = x_1 + x_2 + x_3 + \ldots + x_n$$
$$\text{SumOfSquares} = x_1^2 + x_2^2 + x_3^2 + \ldots + x_n^2$$

$$\text{Mean} = \frac{sumofvalues}{n}$$

$$\text{Standard deviation} = \sqrt{\left(\frac{sumofsquaresofvalues}{n}\right) - (Mean)^2}$$

Sample run (user input is shown in bold type):

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Karl Keen – Section 1234 – Program

This program will produce statistics (Mean, Standard Deviation, Maximum and
Minimum values of the list) for a list of real values.  The user will
provide the names of input and output files.

Enter the name of the input file: STATNUMS.DAT
Enter the name of the output file: STATNUMS.out

Reading values . . .
10 11 8 9 6 21 54 89 2 15
34 5 8

Number of values read : 13
   Mean of the values : xxx.xxx
   Standard deviation : xxx.xxx
       Greatest value : xxx.xxx
          Least value : xxx.xxx

End of program.
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print header

output will have the text as well as #'s

10 11 8 → print 10 #'s per line

STATS #val read : 13

can be floats from the file as well