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Script started on Thu 16 Mar 2017 07:11:10 PM CDT
\033]0;b_pepa@mars:~/CSC122/stats\007[b_pepa@mars stats]$ pwd
/home/students/b_pepa/CSC122/stats
\033]0;b_pepa@mars:~/CSC122/stats\007[b_pepa@mars stats]$ cat stats.info
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CSC122-001
Round 'em Up!
Lab

**(level 1.5)**

Description:
        This program takes a number set from a file, and calculates relevant
statistics on this data, including maximum, minimum, average, standard
deviation, and number of values.
\033]0;b_pepa@mars:~/CSC122/stats\007[b_pepa@mars stats]$ cat stats.cpp
#include <iostream> //cin and cout
#include <fstream> //for file streams
#include <cmath> //to calculate the statistics
using namespace std;

const long MAX_FNAME = 200;

//calculates the statistics of a data set in a file
//and outputs the information
void stats(ifstream & f);

//compares num to max and returns the higher number
inline double findMax(double num, double max)
   { return num < max ? max : num; }
//same as above except for with min
inline double findMin(double num, double min)
   { return num > min ? min : num; }

//pass the total of x[i]^2, n, and the average and it will return
//the sample standard deviation
inline double StdDev(double var, long count, double ave)
   { return sqrt( ( (-1 * count * pow(ave,2.0)) + var) / (count - 1) ); }

//prints the count, minimum, average, maximum, and standard deviation
void printData(long count, double minimum, double average,
               double maximum, double stdev);


int main(void)
{
   ifstream file;
   char fname[MAX_FNAME];

   cout << "\tWelcome to the Number Statistics Program"
        << "\n\nPlease enter the name of your data file: ";
   cin.getline(fname, MAX_FNAME);
   file.open(fname);
   while(!file)
   {
      file.close();
      file.clear();
      cout << "\nI'm sorry, I could not open \'" << fname
           << "\'. Please enter another name:\n";
      cin.getline(fname, MAX_FNAME);
      file.open(fname);
   }

   stats(file);
   cout << "\nThank you for using the NSP!\n\n";
   file.close();

return 0;
}


void printData(long count, double minimum, double average,
               double maximum, double stdev)
{
   cout << "\n\nFor your data, the statistics are as follows:\n\n"
        << "\t  Count:  " << count   << endl
        << "\tMinimum:  " << minimum << endl
        << "\tAverage:  " << average << endl
        << "\tMaximum:  " << maximum << endl
        << "\t StdDev:  " << stdev   << endl;
return;
}

void stats(ifstream & f)
{
   double input, max, min, average,
          stdev, var, total;
   long count = 1;

   f >> input;
   max = input;
   min = input;
   var = pow(input,2.0);
   total = input;

   while(!f.eof())
   {
      f >> input;

      max = findMax(input, max);
      min = findMin(input, min);
      var += pow(input,2.0);
      total += input;
      ++count;

      //Removes any white spaces
      f >> ws;
   }

   average = total/count;
   stdev = StdDev(var, count, average);

   printData(count, min, average, max, stdev);

return;
}
\033]0;b_pepa@mars:~/CSC122/stats\007[b_pepa@mars stats]$ cat numset1
1 2 3 4
5 6 7 8

9 10
\033]0;b_pepa@mars:~/CSC122/stats\007[b_pepa@mars stats]$ cat numset2
33  30  188 157 186 85  40  78  147 103
63  42  87  191 88  175 131 141 15  23
90  112 152 18  169 100 176 122 144 16
190 142 127 17  4   8   5   66  83  195
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stats.cpp***


\033]0;b_pepa@mars:~/CSC122/stats\007[b_pepa@mars stats]$ ./stats.out
        Welcome to the Number Statistics Program

Please enter the name of your data file: asdf

I'm sorry, I could not open 'asdf'. Please enter another name:
numset1


For your data, the statistics are as follows:

          Count:  10
        Minimum:  1
        Average:  5.5
        Maximum:  10
         StdDev:  3.02765

Thank you for using the NSP!

\033]0;b_pepa@mars:~/CSC122/stats\007[b_pepa@mars stats]$ ./stats.out
        Welcome to the Number Statistics Program

Please enter the name of your data file: numset2


For your data, the statistics are as follows:

          Count:  40
        Minimum:  4
        Average:  98.475
        Maximum:  195
         StdDev:  62.6963

Thank you for using the NSP!

\033]0;b_pepa@mars:~/CSC122/stats\007[b_pepa@mars stats]$ cat stats.tpq
Thought Provoking Questions

1.Does spacing between the numbers matter?

A) the insertion operator for file streams works
   the same way as cin's insertion operator, so spacing between
   the numbers doesn't matter

2.Do they have to be in order(ascending/descending)?

A) no? there's no need for this even for minimum or maximum.

3.Do they have to be integers? floating point?

A)the best way to input would be floating point, and since we don't have to
  test if numbers are equal, we can do this without issues.

4.Is it possible for your program to run out of space while reading the
  file? (it shouln't be...)(Hint: Do you have to have all of the data values
  in memory to complete the calculations requested?)

A)None of the calculations require all of the data values to be stored.
  therefore, it is not possible to run out of space while reading the file.

5.When finding the largest/smallest item in a list, what value should you
  start with as your assumed smallest/largest value?

A)The first item in the list will be the smallest/largest value at first.
  this garentees that your list will contain the smallest/largest value no
  matter what.
\033]0;b_pepa@mars:~/CSC122/stats\007[b_pepa@mars stats]$ exit
exit

Script done on Thu 16 Mar 2017 07:12:20 PM CDT
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