#ifndef STATISTIC\_H

#define STATISTIC\_H

/\*  Assignment:     Statistician Program

    Author:         Ryan Wood

    Date Created:   January  14, 2018

    Requirements:   Create a Statistic class that recieves numerical input

                    and calculates how many values have been input, the average

                    of all the values, the total of all the values, the largest

                    and smallest values, and allows the statistic to be cleared

                    for reuse

\*/

/\*Statistic Header file\*/

class Statistic

{

    public:

        /\*  Function:   Statistic()

            Purpose:    default constructor. Initializes the Statistic object

                        and creates an instant of the Statistic.

            Return:     the Statistic instance

        \*/

        Statistic();

        /\*  Function:   initStat()

            Purpose:    initializes the member variables of the Statistic

                        to zero, clearing any previous values held

        \*/

        void initStat();

        /\*  Function:   add(double)

            Purpose:    adds the given value to the statistics, adding the

                        value to the sum, incrementing the number of

                        values that have been added by one, and determining

                        a new largest or smallest as necessary

            Parameters: the value to add

        \*/

        void add(double val);

        /\*  Function:   getLength()

            Purpose:    retrieves the number of values that have been added

            Return:     the number of values added

        \*/

        int getLength();

        /\*  Function:   getSum()

            Purpose:    gets the sum of all values that

                        have been added

            Return:     the sum

        \*/

        double getSum();

        /\*  Function:   getAverage()

            Purpose:    retrieves the average of all the values

                        that have been added

            Return:     the average

        \*/

        double getAverage();

        /\*  Function:   getLargest()

            Purpose:    retrieves the largest value that has been

                        added to the statistics

            Return:     the largest value

        \*/

        double getLargest();

        /\*  Function:   getSmallest()

            Purpose:    retrieves the smallest value that has been added to

                        the statistic

            Return:     the smallest

        \*/

        double getSmallest();

    private:

        /\*  Function:   largest(double, double)

            Purpose:    determines which of the given values

                        is the largest

            Return:     the largest of the two values

        \*/

        double largest(double, double);

        /\*  Function:   smallest(double, double)

            Purpose:    determines which of the given values

                        is the smaller value

            Return:     the smallest value

       \*/

        double smallest(double, double);

        double m\_smallest;//the smallest value entered

        double m\_largest;//the largest value entered

        double m\_valTotal;//the total values entered

        int    m\_numVals;//the number of values entered

};

#endif

#include "Statistic.h"

/\*  Assignment:     Statistician Program

    Author:         Ryan Wood

    Date Created:   January  14, 2018

    Requirements:   Create a Statistic class that recieves numerical input

                    and calculates how many values have been input, the average

                    of all the values, the total of all the values, the largest

                    and smallest values, and allows the statistic to be cleared

                    for reuse

\*/

/\*Statistic implementation file\*/

Statistic::Statistic()

{

    m\_smallest = 0.0;

    m\_largest = 0.0;

    m\_valTotal = 0.0;

    m\_numVals = 0;

}

void Statistic::initStat()

{

    m\_smallest = 0.0;

    m\_largest = 0.0;

    m\_valTotal = 0.0;

    m\_numVals = 0;

}

void Statistic::add(double val)

{

    m\_smallest = smallest(val, m\_smallest);

    m\_largest = largest(val, m\_largest);

    m\_valTotal += val;

    m\_numVals++;

}

int Statistic::getLength()

{

    return m\_numVals;

}

double Statistic::getSum()

{

    return m\_valTotal;

}

double Statistic::getAverage()

{

    return m\_valTotal / m\_numVals;

}

double Statistic::getLargest()

{

    return m\_largest;

}

double Statistic::getSmallest()

{

    return m\_smallest;

}

double Statistic::largest(double val1, double val2)

{

    if(val1 > val2)

        return val1;

    return val2;

}

double Statistic::smallest(double val1, double val2)

{

    if(val1 < val2)

        return val1;

    return val2;

}

/\*  Assignment:     Statistician Program

    Author:         Ryan Wood

    Date Created:   January  14, 2018

    Requirements:   Create a Statistic class that recieves numerical input

                    and calculates how many values have been input, the average

                    of all the values, the total of all the values, the largest

                    and smallest values, and allows the statistic to be cleared

                    for reuse

\*/

/\*Statistic Main file\*/

#include "Statistic.h"

#include <iostream>

#include <fstream>

using namespace std;

ofstream outFile("Statistics.out");

int main()

{

    Statistic stat;

    Statistic stat2;

    stat.add(52.5);

    stat.add(65.6);

    stat.add(87.8);

    stat.add(-35.4);

    stat.add(-10.5);

    stat.add(4.7);

    stat.add(90.1);

    outFile << "sum stat1 = " << stat.getSum() << endl;

    outFile << "length of stat1 = " << stat.getLength() << endl;

    outFile << "stat1 value average = " << stat.getAverage() << endl;

    outFile << endl;

    stat2.add(203);

    stat2.add(421);

    stat2.add(571);

    stat2.add(487);

    stat2.add(312);

    stat2.add(445);

    stat2.add(624);

    stat2.add(623);

    stat2.add(324);

    stat2.add(732);

    outFile << "sum stat2 = " << stat2.getSum() << endl;

    outFile << "length of stat2 = " << stat2.getLength() << endl;

    outFile << "stat2 value average = " << stat2.getAverage() << endl << endl;

    stat2.initStat();

    stat2.add(99.3);

    stat2.add(-69.3);

    stat2.add(83.2);

    stat2.add(78.2);

    stat2.add(88.2);

    stat2.add(83.8);

    stat2.add(77.2);

    stat2.add(-39.2);

    stat2.add(76.6);

    stat2.add(96.3);

    outFile << endl;

    outFile << "Cleared stat2 and added new values" << endl;

    outFile << "sum stat2 = " << stat2.getSum() << endl;

    outFile << "length of stat2 = " << stat2.getLength() << endl;

    outFile << "stat2 value average = " << stat2.getAverage() << endl;

    outFile << "stat2 largest = " << stat2.getLargest() << endl;

    outFile << "stat2 smallest = " << stat2.getSmallest() << endl;

    outFile.close();

    return 0;

}