

Learning to Use the Development Environment

Obviously you cannot program unless you understand how to create a file containing your C++ language source code, how to compile and link the source code to produce a program, how to execute (run) the program, test its behavior, fix errors, etc.

For the first programming project, you will be given C++ source code for a working program. Your task is to type in the given source code, including the comments, without making any unspecified modifications, and verify that it does indeed perform as specified. Along the way, you'll be exposed to quite a bit of C++ language that we haven't even begun to cover, so don't get paranoid. Try to understand the given source code (lots of comments have been included to help), but realize that this program uses elements of the C++ language from the first seven chapters of the class notes.

What to turn in and how:

Submit your C++ source code file to the Curator System. Instructions for submitting to the Curator are given in the *Student Guide* in the back of the course notes pack, and are also available from the Curator homepage; see the link from the CS 1044 web page. Be sure to follow those instructions carefully.

The Program:

```
// Project 1 for CS 1044 Spring 2001
//
// Student:      <put your name here>
//
// Programmer:   William D McQuain
// OS:          Windows NT Workstation 4.0
// System:       Pentium II 400, 128 MB Memory
// Compiler:     Visual C++ 6.0, Service Pack 4
// Last modified: August 23, 2000
//
// Purpose
// This program reads a list of integer values from an input file,
// counts how many integers are in the list, computes the sum of
// the integers, and determines the minimum and maximum values in
// the list.
//
// The program then writes a summary of its findings to an output
// file.
//
#include <iostream> // for cout
#include <fstream>  // for file streams
#include <iomanip>   // for formatting manipulators
#include <string>   // for string variables
#include <climits>  // for INT_MAX and INT_MIN
using namespace std;

void main() {

    int NextValue; // the current value read from the input file
    int Sum = 0;   // the sum of all the values read so far
    int Min = INT_MAX; // the minimum value seen so far
    int Max = INT_MIN; // the maximum value seen so far
    int NumValues = 0; // the number of values that have been read
```

```
string DataFile    = "IntegerList.data"; // name of the input file
string ResultsFile = "Results.data";    // name of the output file

ifstream In(DataFile.c_str()); // attach an input stream to the input file

// If the input file does not exist, this will detect that.
// We handle that by printing an error message and stopping the program.
if (In.fail()) {
    cout << "Input file not found: " << DataFile << endl;
    cout << "Exiting..." << endl;
    return;
}

In >> NextValue; // Try to read the first value

while ( In ) { // Continue as long as the last read succeeded
    Sum      = Sum + NextValue; // Update the sum
    NumValues = NumValues + 1; // Count this value

    if (NextValue < Min) // See if it's a new minimum
        Min = NextValue;
    if (NextValue > Max) // See if it's a new maximum
        Max = NextValue;

    In >> NextValue; // Try to read another value
}

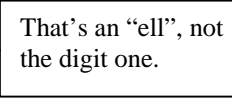
// Close the input file:
In.close();

ofstream Out(ResultsFile.c_str()); // attach a stream to the output file

// Write an identification header to the output file:
Out << "Programmer: " << "<put your name here>" << endl;
Out << "CS 1044 Spring 2001 Project 1" << endl;
Out << endl;

// Write a summary of the results computed above:
Out << "Number of values summed:" << setw(5) << NumValues << endl;
Out << "Sum of the values:      " << setw(5) << Sum << endl;
Out << "Minimum of the values:  " << setw(5) << Min << endl;
Out << "Maximum of the values:  " << setw(5) << Max << endl;

// Close the output file:
Out.close();
In.close();
}
```



That's an "ell", not the digit one.

Sample Input and Corresponding Output:

```
34
87
42
51
13
78
-41
0
42
13
-76
21
17
32
89
-4
-3
9
38
29
```

```
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CS 1044 Spring 2001 Project 1
```

```
Number of values summed: 20
Sum of the values: 471
Minimum of the values: -76
Maximum of the values: 89
```