

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 (I've included lots of comments 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 Summer II 2003
//
// Student:      <put your name here>
//
// Last modified: July 2, 2003
//
// Purpose
// This program reads a list of circle radius values from an input file,
// calculates the area and circumference of each circle, and outputs the
// results to an output file.
//
#include <iostream> // for cout
#include <fstream>  // for file streams
#include <iomanip>   // for formatting manipulators
#include <string>   // for string variables
using namespace std;

void main() {

    const double PI = 3.1415926535; // used in mathematical equations

    double Radius;      // the current value read from the input file
    double Area;        // the area of the circle
    double Circumference; // the circumference of the circle

    string DataFile     = "Input.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;
    }
}
```

```
ofstream Out(ResultsFile.c_str()); // attach a stream to the output file
Out << fixed << showpoint; // initialization for floating point numbers

// Write an identification header to the output file:
Out << "Programmer: " << "<put your name here>" << endl;
Out << "CS 1044 Summer 2003 Project 1" << endl;
Out << endl;

// Output the column headings
Out << "Radius Area Circumference" << endl;
Out << "-----" << endl;

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

while ( In ) { // Continue as long as the last read succeeded

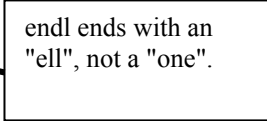
    Area = PI * Radius * Radius; // Calculate the area of the circle
    Circumference = 2.0 * PI * Radius; // Calculate the circumference

    // Output the values for this radius
    Out << setprecision(1) << setw(6) << Radius << setw(8) << Area
        << setw(12) << Circumference << endl;

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

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

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



Sample Input File:

```
2
1.5
10
9
4.7
8.2
100
19
23.4
```

Sample Output File:

```
Programmer: Rich Wheaton
CS 1044 Summer 2003 Project 1

Radius      Area      Circumference
-----
  2.0      12.6      12.6
  1.5       7.1       9.4
 10.0     314.2     62.8
  9.0     254.5     56.5
  4.7      69.4     29.5
  8.2     211.2     51.5
100.0  31415.9   628.3
 19.0     1134.1   119.4
 23.4     1720.2   147.0
```