

Lab 3 – File I/O and Strings

Topics to be covered:

- File I/O
- Basic use of string
- Predefined functions such as pow () and sqrt ()

Example code:

- FileIOString.cpp

Pieces of code:

```
***** Include Header File *****
#include <fstream>

***** File Opening *****
//Declaring input and output files.
ifstream infile;
ofstream outfile;

//C-string used to save input file name.
char[20] filename;

//Reading input file name.
cout << "Please type your input file name: ";
cin >> filename;

//Opening input and output files.
infile.open (filename);
outfile.open ("output.txt");

***** File Reading and Writing *****
//Reading input file.
infile >> x >> y >> z;

//Writing to output file.
outfile << "The last number in " << filename << " is " << z << endl;

***** File Closing *****
infile.close ();
outfile.close ();

***** Math Library Functions *****
#include <cmath>

//Both pow () and sqrt () functions require and return double type.
outfile << "The square of the number " << x << " is " << pow (x, 2);
outfile << "\nThe cube of the number " << x << " is " << pow (x, 3);
outfile << "\nThe square root of " << x << " is " << sqrt (x);
//using pow () to do square root
outfile << "\nThe square root of " << x << " is " << pow (x, 0.5);
```

Lab 3

Exercise 1 (Design only – not a C++ program)

For Assignment 1 below, please write a defining diagram (input, process, output) and pseudocode for the problem. Your typed solution is to be included in the lab folder.

Assignment 1:

Write a complete C++ program in which main() opens an input file named *input.txt* and from that file reads a person's first name (doesn't exceed 19 characters) followed by their height in feet and inches. Send the height to a function *ToCentimeters* that calculates and returns the person's height in centimeters. Main should display to the screen the person's name and height in both *inches* and *centimeters*.

(We'll show you how to create sample input files in lab)

Input file format:

First name (String of characters with length < 20)

2 positive integers

each of the 3 items in the file should be separated by blank(s) and/or a newline (enter key)

Assignment 2:

Write a complete C++ program that prompts the user for the name of an input file to open. The input file should contain 4 basic arithmetic equations of the form:

integer = integer operator integer

The formatting of the file need not be neat (see sample input file below). The program is to read in these 4 equations from the input file and write each equation to the output file **output.txt** with one equation per line and one space between integers and operators.

Sample input file:

28 = 3 + 25
-7
= 2
- 9

3 = 6
/ 2

12
=
3 * 4

Associated output file:

28 = 3 + 25
-7 = 2 - 9
3 = 6 / 2
12 = 3 * 4