
COMP 116 Data Structures

Lab #4

In this lab, we will practice using `ifstream` and `ofstream` to read and write data files. You can do all the exercises for this lab in a project called Lab04.

1. Download the file “barn.zip” from the course schedule. Extract the files from the .zip archive and move them all to the `cmake-build-debug` folder of the project. These are all the input files we will use for the exercises today.
2. The first exercise concerns the files ‘barn.moo’ and ‘barn1.moo’. The first line of the file contains an integer indicating the number of data lines that follow it. All the lines of the file have the following format:

oink oink [integer] woof [float] quack roar roar [string] meow

Take a look at the file to see exactly what it looks like (use Wordpad if you have a Windows computer – Notepad doesn’t view the newlines correctly – and use TextEdit if you have a Mac).

Write a function `readBarn` that takes a string containing a file name as input and prints on screen the smallest integer, the average of all the floating-point numbers and the longest string in the file.

Then, write a main that asks the user to enter a file name, and calls `readBarn` on that file name.

_____ Show me the result when you are done.

3. The second exercise concerns the files ‘field.moo’ and ‘field1.moo’. Fields are much less organized than barns, so this exercise is exactly the same as the previous one, except that there is no integer at the beginning telling you how many lines there are. You have to write a program that reads every line until you reach the end of the file.

Write a function `readField` that takes a two strings containing file names as input and an output file, and writes to the output file the smallest integer, the average of all the floating-point numbers and the longest string in the file.

Then, write a main that asks the user to enter an input file name, an output file name, and calls `readField` on them.

_____ Show me the result when you are done.

4. Miss Piggy is teaching at Hogwarts and she would like to calculate the final grades of her students. All the information about her two classes is contained in the files 'grades.pig' and 'grades1.pig'. The format is as follows:

[Firstname] [Lastname] [grade1] [grade2] [grade3] [grade4] [grade5]

All the grades are floating-point numbers. The first grade is worth 10% of the final grade, the second grade is worth 25%, the third is worth 15%, the fourth is worth 20% and the fifth is worth 30%.

Write a program that asks the user for an input file, an output file, and for each student in the input file, writes the following to the output file:

[Firstname] [Lastname] [final grade]

The file does not contain any indication of how long it is, your program should read the data file till the end.

_____ Show me the result when you are done.

When you are done, write your name on the sheet and hand it to the lab instructor.

Name: _____