

# CPSC 410

## Project 1

### Motivation: Get used to C++ again

#### Overview

You are given a file that has an unknown number of rows, and 4 columns of integers that looks like the following. Note that all values are separated by commas.

```
process_number, start_time, cpu_time, io_time
1,1,6,1
2,3,10,5
3,4,4,1
4,5,3,1
```

This file can have any name, but I will call it testdata.txt for the purposes of this document. The first row describes each columns function, skip this row when reading data. You also have to handle files that do not have the row of column names.

I have provided a header file (utilities.h) which describes the API that you are to generate. Please generate the corresponding utilities.cpp. This API defined in this file is responsible for reading data from a given file, handling whether the first row has column labels or not , handling corrupt data (see below) and sorting the data.

#### Input Data:

I have provided 3 separate sample input files; 1 with column headings (TestData\_Heading.txt), 1 without column headings (TestData\_NoHeading.txt), and with without column headings and corrupt data (TestData\_NoHeading\_CORRUPTED\_ROWS.txt).

Corrupt data may present itself in the following ways only;

1. Any row that is missing 1 or more commas is corrupted

```
1 1,2,3
2 1 2 3
3,1 2 3
```

2. Any row that has less than 4 numeric columns is corrupted

1,1,2, 2, 1, 2,3
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As you can imagine, there are many other ways that data can be corrupted, but ignore those for now. **Please discard corrupted rows.**

## Running project

The main() function resides in fileio.cpp. It runs several tests against utilities.cpp. Currently it generates a grade of 0, your task is to get this to 100 by correctly filling in content to utilities.cpp.

## Your task

1. Complete utilities.cpp and turn it in. Please see utilities.h for required content. You can add any additional content that you would like to utilities.cpp just as long as you complete the required functions. Please be sure not to modify utilities.h since you are not submitting this file thus I will not see your changes.

## To Turn In

utilities.cpp only

## Grading

I will drop your utilities.cpp file in a clean 410\_Proj1\_Student project. I will run the project to determine your grade.

## APIs that may help

std::string  
std::vector  
stringstream  
std::getline  
ifstream and ofstream  
std::sort