



# CPSC 1620 A – Fundamentals of Programming I – Fall 2021

## Final Examination [30 points]

December 14th, 2021

Duration: 1:15

### Instructions

- Fork `Final` project.
- Clone it in Atom.
- Create a file `final.in` that contains your data.
- Create a file `final.cc` that contains your program.
- Work on your program. Make sure to follow the standard: `fetch/pull` → `work` → `stage all/commit/push` procedure.
- Make sure to make the last push before the exam is over as the last push will be graded.
- Once you are done:
  - Go to your `Final` on Gitlab
  - Check if you are satisfied with your solutions
  - From the left sidebar choose `Project information` - `Members`
  - Switch from `Invite member` to `Invite group`,
  - Enter the group name `Team1620` in the `Select a group to invite` field,

- Leave `Max` role as Maintainer,
  - Click the `Invite` button.
- Good luck!

## Problem [30 points]

1. Given an input file `final.in` containing students' data that consist of students' first and last names followed by their grades, such as:

```
Paul Wilkinson 84.5
John Doe 82.75
Jackie Low 88.25
Shelly Well 84.5
```

Write a program `final.cc` that reads from the input file `final.in` students' data. The program should print out the students' ranks, names and grades from the highest to the lowest. Suppose that your program can process a maximum of 200 students, however, you do not know the exact number of data. Your program must have and use at least the following functions:

- (a) **[4 points] `openFile`** – a function that prompts the user to enter the filename and opens it.
- (b) **[1 point] `closeFile`** – a function that closes an open file.
- (c) **[6 points] `getData`** – a function that reads the students' data from an open file.
- (d) **[7 points] `sortData`** – a function that sorts the students' data in a decreasing order of the grades.
- (e) **[7 points] `printData`** – a function that prints the student's rank, name and grade, in the decreasing order from the highest grade to the lowest grade in the following format. Rank 1 is attributed to the highest grade, next rank to the second highest grade, etc. For example, given the input file above, the outputs should be:

1	Low, Jackie	88.25
2	Wilkinson, Paul	84.50
	Well, Shelly	84.50
4	Doe, John	82.75

**[5 points]** Your program must read from an input file where the data are coded as follows: `firstname space lastname space grade`, and the function `main` should be merely a collection of variable declarations and function calls.