

CSC 365: Lab 1-b writeup

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Initial Decisions / Modifications to Part A:

We chose to extend our previous program instead of writing from scratch due to changes being easy to make, both thanks to python as a language from us separating out the code into many small functions (although this was done for the purposes of splitting up work in part a, it became very helpful when starting part b)

Additionally for NR5 we decided to output both the mean and the median GPA given one of the three categories. We decided to give both the mean and the median as with such a low sample size, the mean could be easily swayed by one or two points of data which the median would account for.

Modifications to Part B:

Originally we recreated the array from part A using the two files from part B but the possibilities of co-teachers made this difficult, so we refitted our program to have two arrays, one for the list file and one for the teachers file. This required us to add a new function to print teacher data from a given classroom, and add an option to our generic search and print function, but besides that, most code could remain the same

Chosen Internal Architecture:

This part remains mostly unchanged from lab1-a, but we updated our main data structures.

Whereas in part A we had one array (the student array) here we have two: The primary data structures (studentArray, teacherArray) are two 2D lists derived from list.txt and teacher.txt where each sublist represents a single student or teacher respectively.

On another note, we split our integer constants from part A into two to represent specific fields in the student and teachers sublists. For example, LASTNAME = 0, FIRSTNAME = 1, and TLASTNAME = 0, TFIRSTNAME = 1, etc. These are used as index pointers to make it easier to reference specific fields in the student and teacher sublists.

Task Log:

Task	Person in Charge	Time taken
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Updating Part A code	Kevin	40 min
C[lassroom]: <number> [S[tudents]] (NR1)	Hannah	15 min
C[lassroom]: <number> [T[eachers]] (NR2)	Hannah	15 min
G[rade]: <Number> [T[eachers]] (NR3)	Kevin	15 min
E[nrollment] (NR4)	Kevin	10 min
GPA: [Grade Teacher Bus] (NR5)	Hannah	40 min
Write up	Kevin	25 min
Testing	We each tested our own functions	Kevin: 30 min Hannah: 25 min

Notes on testing:

A lot of the testing came from updating our part A code to fit into part B. Having to separate storage data structures broke all of the old code that referenced teachers. Several index out of bound bugs were introduced, but once spotted these were easy to fix. Having the test file from part A made this process a lot more seamless as we could be confident that once our test cases all passed, we had successfully removed all reimplementing bugs.

Final notes:

Overall this part of the lab furthered our appreciation for proper databases and query languages, not only would adding more queries into our program become more and more tedious despite containing mostly the same structure of code, but the more data we store in our “database” our program would get significantly slower. If we were to work with large data we would have to restart from the ground up with more complex systems.

Part B usage guide:

NR1: C[classroom]: <number> S[tudents]

C: 101 S

Classroom: 102 Students

NR2: C[classroom]: <number> T[eachers]

C: 101 T

Classroom: 102 Teachers

NR3: G[rade]: <Number> [T]eachers

G: 3 T

Grade: 1 Teachers

NR4: E[nrollment]

E

Enrollment

NR5:

GPA: Grade

GPA: Teacher

GPA: Bus