EE231002 Introduction to Programming

Lab10. Grade Report

Due: Dec. 18, 2021

A course was offered in the College of Science with 100 students from 3 departments attending. During the semester, 3 exams were conducted and scores of each students were collected in the file `lab10.dat`. The first line of the file indicates the content of the following lines and then 100 lines with each line representing a single student. Your assignment is to write a `C` program that generates a grade report for that course. An example of the grade report is shown at the end of this file. The output of your program should have exactly the same format as the example. In calculating the total score for each student, two midterms count 25% each, with final exam counting the other 50%. In addition, the following user-defined types and a global array should be used in your program.

```
typedef enum {math, phys, chem} DEPT;  // all departments

typedef struct student {    // structure for each student's data
    int ID;                 // student ID
    char FName[20];         // first name
    char LName[20];         // last name
    DEPT dept;              // department
    double mt1, mt2, final; // scores for 2 midterms and final
    double total;           // total scores
    int selected;           // extra space for find top scorers
} Student;

Student All[100];           // array of students' data
```

Notes.

1. For the lab, **no sorting** needs to be performed. Since only few students will be selected, sorting on all students is not be an efficient approach.

2. Create a directory **lab10** and use it as the working directory.

3. Name your program source file **lab10.c**.

4. The first few lines of your program should be comments as the following.

   ```
   // EE231002 Lab10. Grade Report
   // ID, Name
   // Date:
   ```

5. After you finish verifying your program, you can submit your source code by

   `$ ~ee2310/bin/submit lab10 lab10.c`

   If you see a "submitted successfully" message, then you are done. In case you want to check which file and at what time you submitted your labs, you can type in the following command:

   `$ ~ee2310/bin/subrec lab10`

   It will show the submission records of lab10.

6. You should try to write the program as efficient as possible. The format of your program should be compact and easy to understand. These are parts of the grading criteria.

Program execution example:
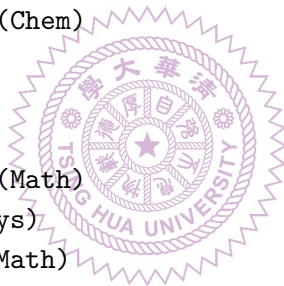
```
$ ./a.out < lab10.dat
Term average: 71.43
  Top students:
    90.12: 20210201 Tyler Smith (Phys)
    86.85: 20210130 Amber Bailey (Math)
    84.62: 20210324 Kayla Jimenez (Chem)

Midterm 1 average: 70.73
  Top students:
    95.0: 20210139 Louis Castillo (Math)
    94.3: 20210201 Tyler Smith (Phys)
    94.3: 20210119 Teresa Rivera (Math)

Midterm 2 average: 70.41
  Top students:
    93.7: 20210114 Gerald Torres (Math)
    93.3: 20210207 Walter Lee (Phys)
    93.0: 20210206 Peter Taylor (Phys)

Final average: 72.30
  Top students:
    95.0: 20210104 Nathan Hernandez (Math)
    94.2: 20210224 Juan Howard (Phys)
    93.8: 20210201 Tyler Smith (Phys)
```