

EE231002 Introduction to Programming

Lab10. College Admission

Due: Dec. 9, 2017

The College of Science, which consists of four departments, Mathematics, Physics, Chemistry and Geosciences Departments, is taking applicants for the new Semester. All applicants are required to take a standard test, that has 3 subjects: Mathematics, Physics and Chemistry. This year there are 100 students applying for the admission. The Admission Office has prepared a list of these applicants in the file, `lab10.dat`. This file has 101 lines. The first line shows the abbreviation of the following lines, and is

```
AppNumber FirstName LastName Math Phys Chem 1st 2nd 3rd 4th
```

That is, each line is composed of 10 fields. In sequence they are: Application number, first name, last name, math test score, physics test score, chemistry test score, department of first priority, department of second priority, the third priority and the fourth priority.

Your assignment is to write a C program to help the admission office to select the students for each department according to the test scores and the students' priority. As a common practice, the student with the highest score would be placed to the department of his/her highest priority first. Each department can accommodate 20 new students. Thus, if the department of a student's top priority is full, then he/she will be placed to the department of the next priority. If two students have the same total score, then the one with the smaller application number will be selected first.

The output of your program is the student list of each department. For reference, the minimum score of the department is also printed. The student list is ordered by application number. Example output is

```
$ ./a.out < lab10.dat
```

```
Math Department: Minimum score 223
```

```
1 201700 Isabella SMITH
2 201705 Emily DAVIS
3 201707 Abigail WILSON
.....
```

```
Phys Department: Minimum score 234
```

```
1 201709 Mia TAYLOR
2 201715 Natalie MARTIN
3 201720 Sarah CLARK
.....
```

Chem Department: Minimum score 228

- 1 201703 Sophia JONES
- 2 201706 Madison MILLER
- 3 201718 Alyssa MARTINEZ
-

Geos Department: Minimum score 230

- 1 201702 Olivia WILLIAMS
- 2 201708 Chloe MOORE
- 3 201719 Ashley ROBINSON
-

Suggested data structure for each applying student is listed at the end.

Notes.

1. Create a directory **lab10** and use it as the working directory.
2. Name your program source file as **lab10.c**.
3. The first few lines of your program should be comments as the following.

```
/* EE231002 Lab10. College Admission
   ID, Name
   Date:
*/
```

4. 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 your submission records for lab10.

5. 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 part of the grading criteria.
6. The following structure and enumeration are recommended for this lab. You should use them in your program.

```
typedef enum sDEPT {                                // define 4 departments
    mathD, physD, chemD, geosD, none,
```

```
} DEPT;

typedef struct sStu {
    int  appNum;           // application number
    char fName[20];        // first name
    char lName[20];        // last name
    int  math, phys, chem; // test scores
    int  total;            // total score
    DEPT pris[4];          // student's priority
    DEPT dept;             // admitted dept
} Stu;
```

