Computer Engineering Department

TED University

Lab Assignment 05
CMPE 252 C Programming, Spring 2021

Part 1 (20 points)

In this lab, first of all you need to create a binary file namely ***exam.bin*** containing records of students entered to a specific exam at TEDU. Each student record should be stored using studentData struct.

```
typedef struct
{
   unsigned int id; // student id
   char name[20]; // student name
   char surname[20]; // student surname
   char department[20]; // department of student
   int grade; // grade of student
} studentData;
```

exam.bin file should consist of 100 records. 94 of them should be blank records. The other 6 records (not blank) should be placed in specific positions of the binary file based on the student ids. For example, if id of a student is 5, its record should be the fifth record in the file. The size of each record should be equal to the size of studentData struct. The records should be sorted according to the student id number. Note that test cases will be provided.

Part 2 (20 points)

Complete the skeleton code ***Lab05_v1_skeleton.c*** by implementing the given function:

int updateGrade(FILE *filePtr, unsigned int id, int newGrade)
Takes FILE pointer to the binary file. Updates final grade of the student whose id is provided in id parameter. If there is a student record with the given id, its grade field is updated and the function returns 1; otherwise, it returns 0.
For sample run, see test_case_2.txt in Moodle.

Part 3 (20 points)

Complete the skeleton code ***Lab05_v1_skeleton.c*** by implementing the given function:

int addStudent(FILE *filePtr, unsigned int id, char name[], char surname[], char department[], int grade);
Takes FILE pointer to the binary file. Adds a student record for which all the information is provided via the parameters of the function. If there is already a student record with the given id, the function returns 0; otherwise, it adds a new student record and returns 1.
For sample run, see test_case_4.txt in Moodle.

Part 4 (20 points)

Complete the skeleton code ***Lab05_v1_skeleton.c*** by implementing the given function:

int deleteStudent(FILE *filePtr, unsigned int id);
Takes FILE pointer to the binary file. Deletes the record of the student whose id is provided in the parameter id by setting its fields to {0, "", "", 0, 0}. If there is a student record with the given id, it is deleted and the function returns 1; otherwise, it returns 0.
For sample run, see test_case_6.txt in Moodle.

Part 5 (20 points)

Complete the skeleton code ***Lab05_v1_skeleton.c*** by implementing the given function:

int showDepartmentRecord(FILE *filePtr, char department[]);
Takes FILE pointer to the binary file. Prints student records whose department field is the same as the parameter department and returns the number of printed student records.
For sample run, see test_case_8.txt in Moodle.

Notes:

Note that parts 2-5 are independent from each other so solution of each part does not require solution of other parts.

Notice that, in the skeleton code, we have provided implementation of the following functions which are supposed to remain as they are:

int main()
Opens the binary file exam.bin for read and update (rb+). Shows all records. Asks for option of the operation to be done, calls the corresponding function, and either shows all records or prints a message based on the value returned from the function call.

void showRecords(FILE *filePtr)
Takes FILE pointer to the binary file and prints all student records in it.