BIL395: Programming Languages
Programming Assignment 3: C Programming

Deadline: Mar 13 at 8:00pm

You will need to submit on uzak.etu.edu.tr four C programs named q1.c, q2.c, q3.c, and q4.c. Please write your name and id number as a comment line at the beginning of each program.

For each question, in each input file, you can assume that columns are separated by tab character.

Question 1:

A small hotel consisting of 3 identical rooms keeps records of its reservations using an IT system which is not connected to the Internet. Due to a hard disk failure, the hotel is not able anymore to see and update reservations. The technicians could only recover a text file, called reservations.txt, which part of it looks as follows:

```
<res.id> <first name> <last name> <check in date> <check out date> <room #>
1344 Antione Hamill 15 10 2020 20 10 2020 1
1235 Delores Balser 12 11 2020 13 11 2020 1
546 Shante Burkhead 01 12 2020 09 12 2020 1
6856 Tiffiny Wimberley 25 11 2020 03 12 2020 2
7524 Lamont Harper 15 10 2020 19 10 2020 3
46 Kera Indelicato 02 11 2020 09 11 2020 3
1232 Laureen Cairo 31 10 2020 02 11 2020 2
7567 Lavada Stegner 25 12 2020 05 01 2021 3
8343 Brandi Ponce 31 10 2020 02 11 2020 1
5857 Miquel Husain 15 10 2020 20 10 2020 2
```

In this question, you are asked to help the hotel owner by writing a C program to do the following task:

Read the `reservations.txt` and save the information about reservations to an array of structures. In this task, you have to create your function, called `readReservationFile`, which reads the `reservations.txt`, populates the struct array and returns the array. In your solution, you have to use at least the following two structures:

```
typedef struct{
      int day; int month; int year;
} date;

typedef struct{
      int id;
```

```
      char firstname[50];
      char surname[50];
      date ind;
      date outd;
      int roomno;
} reservation;
```

Question 2:

Assume that the player scores for a computer game is given in an input file, in which each line stores one player name and his/her score, e.g.,

```
Player     Score
Aynur      900
Bekir      550
Ayse       300
Sultan     300
Erman      1200
Ekim       100
Timur      990
Sule       550
```

Write a program that takes the file name and integer `k` from the console and outputs the top `k` scores along with their corresponding player names in descending order.

Suppose the input file consists of the above player-score information and `k` is entered as 3. Then your program should output:

```
Erman      1200
Timur      990
Aynur      900
```

You may assume that the top K scores are distinct and K is less than or equal to the length of the records.

Question 3:

In the previous question, assume that some scores need to be changed. Write a program that prompts a user to enter a filename, old and new scores and replaces *all* old scores with new ones. The updated scores must be written to another file named `updated_scores_q3.txt`.

As an example, assume the user enters 300 as an old score and 400 as a new one for the previous file. Then a new file `updated_scores_q3.txt` should be created with the following lines:

```
Player     Score
Aynur      900
Bekir      550
Ayse       400
Sultan     400
Erman      1200
Ekim       100
Timur      990
Sule       550
```

In case the old score does not exist in the input file (e.g., the user enters 1000 as an old score for the previous example), then `updated_scores_q3.txt` and input file will consist of the same content.

Question 4:

In Question 4, assume that some scores need to be deleted. Write a program that prompts a user to enter a filename and score `s` and removes *all* players with score `s`. The remaining players and their scores must be written to another file named `updated_scores_q4.txt`.

As an example, assume the user enters the file whose content is shown in Question 2 and 550 as the score. Then players Bekir and Sule along with their scores (550) will be deleted and a new file `updated_scores_q4.txt` should be created with the following lines:

```
Player     Score
Aynur      900
Ayse       300
Sultan     300
Erman      1200
Ekim       100
Timur      990
```

Submission:

- Programs will be written in C.
- This assignment must be done individually (No groups).
- Use the submission link on uzak.etu.edu.tr to send your assignment.
- DON'T compress your submissions.
- Only *.c files will be accepted.
- Submissions sent in different formats (e.g., TXT, ZIP, RAR, etc) will lose 10 points.
- Assignments submitted after the due date will receive 25 point deduction for each day following the due date.
- We'll use an online tool to compute the similarity between all submissions.
- Please see the Ethical Rules section on the syllabus before starting to implement the homework.