Department of Computer Engineering

CENG104 – Computer Programming II

Spring 2017 - 2018

Lab Guide #2/A – Week 3

OBJECTIVE : Structure and Pointer Operations

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Use **POINTER** notation instead of **SUBSCRIPT** notation!

Q1.

Create a nested structure **applicantsOfII** and **grades** as follows:

```
typedef struct{
        int englishProficiency, jury, graduateExam;
 } grades_t;

 typedef struct{
        int id;
        grades_t gr;
        double overall;
}applicantsOfCENG_t;
```

Write the functions:

- **readFile,** which gets a set of application information from a text file named **applicants.txt** until the end of the file is reached, also returns the size of the structure array. (Do not forget to initialize the overall grade to 0 for each student)
- **calculate,** which calculates the overall applicants' grades' average and the overall grade of each applicant with the loads of English proficiency being 30%, jury being 50%, and the graduate exam being 20%)
- **display,** which displays the content of the structure array of applicantsOfII_t type.
- **findPassFail,** a function that finds and displays the number of the applicants who fail and pass the elimination as well as displaying the average of all applicants' grades'. (An applicant passes if overall >= average, otherwise student fails).
- Write a C program that reads the entirety of applicants' information from applicants.txt file into an array of structures, and displays all the information on the screen as necessary, as shown in the example run below.

Example Run:

```
Applicant ID: 1222
Scores:
Applicant English Proficiency: 45
Applicant Jury: 67
Applicant Graduate Examination: 98
Applicant Overall: 66.6

Applicant ID: 1333
Scores:
Applicant English Proficiency: 89
Applicant Jury: 45
Applicant Graduate Examination: 33
Applicant Overall: 55.8

Applicant ID: 1444
Scores:
Applicant English Proficiency: 67
Applicant Jury: 76
Applicant Graduate Examination: 99
Applicant Overall: 77.9

Average is 66.8
Number of the applicants who pass is 1
Number of the applicants who fail is 2
```

applicants.txt

```
1222 45 67 98
1333 89 45 33
1444 67 76 99
```

Project Name: LG2_Question1
Source Name: Q1.cpp

The %s placeholder is one used for reading strings of characters in to character arrays using the scanf function. Therewithal, %s can be used with printf function to print string of characters.
Tips: %s reads one word at a time, to read, for instance, a number of words until new line, use %[^\n] operator; or for reading a number of words until a number has been found, use %[^0-9].

Q2.

Create the structure **movie_t** with the following fields.

```
typedef struct{
        char movieName[25];
        double imdbScore;
} movie_t;
```

a) Create a structure then **initialize** the data with following values, and then **display** as shown in the example run.

Project Name: LG2_Question2
File Name: Q2a.cpp

b) **Get** the structure data from the user, and then **display** as shown in the example run.

Project Name: LG2_Question2
File Name: Q2b.cpp

c) Use Pointer notation for part a.

Example Run for a and c:

```
The movie information is:
Movie Name : The Lord of The Rings The Fellowship of The Ring
Movie's IMDB Score is: 8.8
```

Example Run for b:

```
Please enter the information of the movie:
Enter Movie Name : The Hitchhiker's Guide To The Galaxy
Enter Movie's IMDB Score: 7.2

The movie information is:
Movie Name : The Hitchhiker's Guide To The Galaxy
Movie's IMDB Score is: 7.2
```

Project Name: LG2_Question2
File Name: Q2c.cpp

d) Rewrite the program so that it will read information of the movie from the **movies.txt** file, store them into an array of structure, and display the number of products and the information of all hospitals. Use dynamic memory allocation for the array.

Example Run:

```
There are 3 movies

The Movies Information:
**********************
Movie Name : Black Panther
Movie's IMDB Score is : 8.4
**********************
Movie Name : Pulp Fiction
Movie's IMDB Score is : 8.9
**********************
Movie Name : The Post
Movie's IMDB Score is : 8.5
```

movies.txt

```
3
8.4 Black Panther
8.9 Pulp Fiction
8.5 The Post
```

Project Name: LG2_Question2
File Name: Q2d.cpp