Week 6 Lab Exercise

Lab Instructions

During the lab you should be doing the following things:

1. You need to open Eclipse IDE on the lab machines or any other IDE for C on your own laptops.
2. Read the following tasks carefully and start implementing them.
3. Implement all tasks in one **.c file** inside of the **main** function, separated with the following block of code:

```
printf("========================================\n");
printf("==                TASK 1:               ==\n");
printf("========================================\n");
```

4. During the lab you are allowed to raise your hand and ask for the help from one of our TAs and Instructors if they are available.
5. You are NOT allowed to work on any other things during the lab, except doing the lab exercises.
6. You can discuss the tasks with the classmates and friends during the lab, but you are NOT allowed to do the tasks instead of each other.
7. Academic Misconduct == Plagiarism == copying work from each other is NOT allowed.
8. **During the lab you should finish all the required tasks and submit to Moodle before the deadline to get the grades.**
9. You should be working on the following tasks during **1 hour 15 minutes**.
10. **The deadline for submission is Friday, September 21, at 23:59. Please do not wait until the last minute!**
11. **During the work please make sure that you save your work each time.**
12. **WARNING: once you logged out from the lab machine, your work will be deleted. So please please save your work somewhere externally (any cloud drives or flash drives).**
13. **The maximum point is 1. If you are present, working on given programming tasks and submit the .c file to Moodle you get your 1 point. Otherwise it is zero.**

Lab Exercises

1. **Fibonacci.** Write a C program that accepts non-negative integer value from the user which represents the size of the integer array that need to be filled with Fibonacci sequence. After filling the array, you should output the content of it to the console. Recall that Fibonacci is the sequence of numbers where every number after first two is the sum of the two preceding ones. Your program should also re-ask for the valid input in case if the user provided invalid (negative) number.

   Input-Output Format:

```
Please provide a positive integer:  -3
The value is invalid please provide again: -8
The value is invalid please provide again: 11
Fibonacci for 11: 1 1 2 3 5 8 13 21 34 55 89
```

OR

Input-Output Format:

```
Please provide a positive integer:  5
Fibonacci for 5: 1 1 2 3 5
```

You can also start your sequence with value 0.

2. **Subtraction of two matrices.** Write a program in C that first prompts the user to provide the size of the square matrices, then it allows the user to input each value for each matrix. The inserted values should be used to compute the subtraction between these two matrices. The input and output format of the program should strictly look as was provided in the example below:

Input Format:

```
Input the size for the matrix (less than 6): 3
Input elements in the first matrix:
element – [0],[0]: 1
element – [0],[1]: 5
element – [0],[2]: 6
element – [1],[0]: 11
element – [1],[1]: -1
element – [1],[2]: -7
element – [2],[0]: 8
element – [2],[1]: 13
element – [2],[2]: 2
Input elements in the second matrix:
element – [0],[0]: 4
element – [0],[1]: 7
element – [0],[2]: 3
element – [1],[0]: 5
element – [1],[1]: -2
element – [1],[2]: 4
```

```
element – [2],[0]: 6

element – [2],[1]: 18

element – [2],[2]: 1
```

Output Format:

```
The first matrix is:

1 5 6

11 -1 -7

8 13 2


The second matrix is:

4 7 3

5 -2 4

6 18 1


The Subtraction of two matrices is:

-3 -2 3

6 1 -11

2 -5 1
```

3. **Structures/Objects.** Define a new structure type called patient which has members:
   - **Gender ('m'** and **'f')**
   - **Adult or Not (**adult is 1, child is 0**)**
   - **Weight (**should not be than 2 killos less**)**
   - **Height (**should not be than 40 cm less**)**
   - **Date of Birth**
   - **Month of Birth**
   - **Year of Birth**
   - **Age**

   Then, write some code that declares a single patient variable, and prompts the user to enter in values for the first seven fields and then uses the information of date of birth to compute the age of the patient. At the end, use a **printf** statement that prints out the field contents of the student variables. After you have made it work, please think and write additional loops for the entered values by the user, where the invalid values should not be allowed. For instance, the user could provide incorrect input for the date or weight (some negative values or date bigger than 31).

   Input-Output Format:

```
Gender: g

Gender: f
```

```
Adult or not: 0
Weight: 38
Height: 123
Date of Birth: 45
Date of Birth: 34
Date of Birth: 14
Month of Birth: 2
Year of Birth: 2020
Year of Birth: 2009
```

Output Format:

```
There is a girl with 38 kg, 123 cm and 9 years old.
```

Also note that the female adult is woman, male not adult is boy and male adult is a man.

(Age range is not important so strictly)

Grading and Submission

To receive credit for this lab exercise, you should present in the lab and work of the given lab exercises. You also will have some extra hours after the lab session to finish and submit your work as a **.c file** to **Moodle**. Do not wait until the last minute!

The maximum grade for this lab is **1 points**. To get the maximum, you should be present in the lab and work on the given tasks, you also should be able to submit your work to the moodle despite how well it is written.

In case if you didn't finish the work or the code doesn't work, you should still be able to submit the work before the **deadline**.

Please do not **copy** the work from each other. Instead please ask for the help to be explained.

USEFUL TIPS

- **Save**, **Compile** and **Run**.
- **Running process on the BACKGROUND (Kill your all running process to get the right output):** On the Console window you should be able to see the RED button to stop the running process, then you should be able to close by pressing on the Cross button.
- **FORMAT the code**: to format your code in Eclipse you should be able to use the following commands: Right-click on your code, choose **`Source`**, then from the dropped menu choose **`Format`**.