26.04.2022

Istanbul Technical University
Faculty of Computer and Informatics Engineering
BLG 102E - Int to Scientific&Eng.Computing (C)
Spring 2021-2022

# Midterm 2

- Midterm exam will take **90 minutes** and it will be held in ITU computer laboratories.
- The questions will be announced through Ninova. **Submit your solutions to the corresponding Ninova announcements**: The solution for Q1 must be submitted to the **Midterm 2– Q1**, whereas the solution for Q2 must be submitted to the **Midterm 2 – Q2**.
- Make sure your source code is compiled and linked successfully with the following command options: **–std=c99 –Wall –Werror**. If your code cannot be compiled or linked, you will get 0 points.
- Also make sure that your solution passes all the tests given with the questions before your submission. Remember that we will use more test cases during the evaluation of your solutions.
- You are **not** allowed to use any data structures or types that have not been taught in the lectures. The solutions must be implemented in C programming language. You are also **not** allowed to use pointers in the solutions during this midterm. If you do not follow these instructions, you will get 0 points.

**Q1 (50 pts).** Download the code template given in the question, and **complete** it for the following task:
The program expects the user to enter 20 characters, fills them into an array, prints them, reverses the order of characters and prints the reversed array. These operations are performed with different functions that you need to implement.

- The function **get_characters**(…) handles the job of reading the user input and filling it into an array.
- The function **print_characters**(…) prints the characters in an array.
- Another function called **reverse_characters**(….) reverses the order of the characters in a given array and saves the new list into a new array.

Do not change the function names, and do not modify the text in printf functions. Follow the instructions written in the form of comments in the code template, and complete the necessary parts of the code.

A sample execution of the program is provided below:

```
[yaziciz21@ssh Midterm2]$ ./q1
Insert 20 consecutive characters:12abc3def4itu1773bee

The user entered the following characters:12abc3def4itu1773bee
The characters in reverse order are: eeb3771uti4fed3cba21
[yaziciz21@ssh Midterm2]$
```

**Q2 (50 pts).** Download the code template given in the question, and **complete** it for the following task:
The program asks the user to enter up to 10 non-negative integers, and a choice indicating the type of operation they would like to perform on these integers.
You can assume that the user enters only non-negative integers, and they enter **-1** to terminate the input process.
The integers and the choice are then taken by a function called **alternating_function(….)**. You need to implement this function.

In the **alternating_function**, depending on the user's choice, two different operations can be performed. For example, if the user enters the following integers 2 3 4 5 6 2 3 4 4 5 AND their choice is 1 (indicating an alternating sum operation), then the program does the following calculation: 2 – 3 + 4 – 5 + 6 – 2 + 3 – 4 + 4 – 5 and prints the result of 0.00.
If their choice is 2 (indicating an alternating division operation), then the program does the following calculation: 2 / 3 * 4 / 5 * 6 / 2 * 3 / 4 * 4 / 5 and prints the result of 0.96.

A sample execution of the program is provided below:

```
[akti15@ssh midterm2]$ ./q2
Enter up to 10 non-negative integers (-1 to terminate):2 3 4 5 6 2 3 4 4 5

Enter your choice (1 for alternating sum or 2 for alternating division):1
The result is 0.00
[akti15@ssh midterm2]$ ./q2
Enter up to 10 non-negative integers (-1 to terminate):2 3 4 5 6 2 3 4 4 5

Enter your choice (1 for alternating sum or 2 for alternating division):2
The result is 0.96
[akti15@ssh midterm2]$
```