| **Software Engineering Department - ITU** |
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| **SE101T: Programming Fundamentals Lab** |

| **Course Instructor: Usama Bin Shakeel** | **Dated: 10/10/2023** |
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| **Teaching Assistant: Aasma Abdul Waheed** | **Semester: Fall 2023** |
| **Teaching Assistant: Abeera Ashraf** | **Batch: BSSE2023** |

# **Lab 7B. Arrays**

| **Name** | **Roll number** | **Report**  **(out of 100)** | **Scaled to 10** | **Total**  **(out of 10)** |
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Checked on: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

## **Conduct of Lab**

1. Students are required to perform this experiment individually.
2. In case of ambiguity seek help from the course instructor, lab engineers, assigned teaching assistants

**Instructions**

**Task 1:** Accept the assignment posted in Google Classroom and after accepting, clone the repository to your computer for this, ensure that either you have logged into Github app with your account.

**Task 2:** Solve the given problems written after task instructions, write code through IDE like CLion/ Visual Studio Code etc.

**Task 3:** Run the code through Cygwin, use command **‘make run’** to get the output of the code

**Task 4:** Use **‘make test’** command on Cygwin to test the C++ code.

**Task 5:** Ensure your code/solution is in the cloned folder.

**Task 6:** Commit and Push the changes through the Github App.

**Lab Tasks**

Write code in functions named **q1**, **q2**, and so on, after completing each part, verify through running code using **“make run”** on cygwin.

***Q1. Write a program in a function named q1 that reads 10 integers from the user, stores them in an array, and then finds and displays the largest number in the array. Function q1 should return the integer type largest element to the main function.***

***Q2. Write a program in a function named q2 that checks whether a given integer is present in an array of 15 integers. Display "Found" or "Not Found" accordingly in the main function.***

***Q3. Write a program in a function named q3 that takes an array of 6 floating-point numbers as input from the user and calculates and displays the average of the numbers in the main function.***

***Q4. Write a program in a function named q4 to find and display the sum of all elements in a 2D integer array of size 3x3 in the main function.***

***Q5. Write a program in a function named q5 that reads 8 integers from the user, stores them in an array, and then calculates and returns the sum of the even numbers in the array, which will be displayed in the main function.***

### Assessment Rubric for Lab

**Method for assessment:**

Lab reports and instructor observation during lab sessions. Outcome assessed:

a. Ability to conduct experiments, as well as to analyze and interpret data (P) b. Ability to function on multi-disciplinary teams (A)

c. Ability to use the techniques, skills, and modern engineering tools necessary for engineering practice (P)

| **Performance metric** | **Task** | **CLO** | **Description** | **Max marks** | **Exceeds expectation** | **Meets expectation** | **Does not meet expectation** | **Obtained marks** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1. Realization of experiment (a) | 1 | 1 | Functionality | 40 | Executes without errors excellent user prompts, good use of symbols, spacing in output. Through testing has been completed (35-40) | Executes without errors, user prompts are understandable, minimum use of symbols or spacing in output. Some testing has been completed (20-34) | Does not execute due to syntax errors, runtime errors, user prompts are misleading or non-existent. No testing has been completed (0-19) |  |
| 2. Teamwork (b) | 1 | 3 | Group Performance | 5 | Actively engages and cooperates with other group member(s) in effective manner (4-5) | Cooperates with other group member(s) in a reasonable manner but conduct can be improved (2-3) | Distracts or discourages other group members from conducting the experiment (0-1) |  |
| 3. Conducting experiment (a, c) | 1 | 1 | On Spot Changes | 10 | Able to make changes (8-10) | Partially able to make changes (5-7) | Unable to make changes (0-4) |  |
| 1 | 1 | Viva | 10 | Answered all questions (8-10) | Few incorrect answers (5-7) | Unable to answer all questions (0-4) |  |
| 4. Laboratory safety and disciplinary rules (a) | 1 | 3 | Code commenting | 5 | Comments are added and does help the reader to understand the code (4-5) | Comments are added and does not help the reader to understand the code (2-3) | Comments are not added (0-1) |  |
| 5. Data collection (c) | 1 | 3 | Code Structure | 5 | Excellent use of white space, creatively organized work, excellent use of variables and constants, correct identifiers for constants, No line-wrap (4-5) | Includes name, and assignment, white space makes the program fairly easy to read. Title, organized work, good use of variables (2-3) | Poor use of white space (indentation, blank lines) making code hard to read, disorganized and messy (0-1) |  |
| 6. Data analysis (a, c) | 1 | 4 | Algorithm | 20 | Solution is efficient, easy to understand, and maintain (15-20) | A logical solution that is easy to follow but it is not the most efficient (6-14) | A difficult and inefficient solution (0-5) |  |
| 7. Computer use (c) | 1 | 2 | Documentation & Github Submissions | 5 | Timely (4-5) | Late (2-3) | Not done (0-1) |  |
|  | Max Marks (total): | | | 100 | Obtained Marks (total): | | |  |

Lab Engineer Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_