**Bahria University, Lahore Campus**

Department of Computer Science

Lab Journal 08

**(Spring 2023)**

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| Course: | **Data Structures and Algorithm - Lab** | Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| Course Code: | CSL-221 | Max Marks: 10 |
| Faculty’s Name: | Fatima Zulfiqar |  |

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enroll No: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Class: \_\_\_\_\_\_\_\_\_\_\_\_\_\_

Objective(s):

Upon completion of this lab session, learners will be able to:

* Implement different problems using recursion
* Implement Merge Sort Algorithm

## Lab Tasks:

**Task 1**

Write a recursive function to find the length of any string. The string should be taken from the user.

**Task 2**

Write a recursive function to find the number of occurrence (frequency) of a given character in any string. **Hint:** You can convert all alphabets of input string to lower case for easy computation.

**Sample Output:**

Enter String: Good Morning Pakistan

Enter Character: o

Frequency: o occurred 3 times

**Task 3**

Write a recursive function to compute the power of a given number with a given exponent.

**Sample Output:**

Enter a number: 2

Enter exponent: 3

2^3 = 8

**Task 4**

Write a program that takes your complete name as an input. The program should sort characters in your name in descending order using **Merge Sort Algorithm**. **Hint:** You can convert all alphabets of input string to either upper or lower case for easy computation. Also remove any white spaces.

**Sample Output:**

Enter a string: Fatima Zulfiqar

After Sorting: z u t r q m l i i f f a a a

**Note:** The program should contain main-menu in such a way that all tasks are incorporated in a single program. The user can select either of the options until desires. You can hard code input of Task 4 only.

**Lab Grading Sheet :**

|  |  |  |  |
| --- | --- | --- | --- |
| **Task** | **Max Marks** | **Obtained Marks** | **Comments(*if any*)** |
| 1. | 2 |  |  |
| 2. | 2 |  |  |
| 3 | 2 |  |  |
| 4 | 4 |  |  |
| **Total** | **10** |  | **Signature** |

**Note : Attempt all tasks and get them checked by your Lab Instructor. Also for each task, attach a screenshot of the output.**