

**The objective of this lab is to:**

This lab aims to enhance students' understanding of **stacks** and their applications in solving real-world problems efficiently.

**Instructions:**

- 1) Use **stacks** to solve both tasks efficiently.
- 2) Do not use built-in stack libraries
- 3) Ensure correctness by testing with multiple **input cases**.
- 4) Implement each function **efficiently** to minimize time and space complexity.

**Task 01(Maximum Absolute Difference)****15 Marks**

Given an array of integers `arr[]` of size `N`, determine the maximum absolute difference between its nearest left smaller and nearest right smaller elements.

**Definitions:**

- Left Smaller (`LS[i]`): The nearest smaller element to the left of `arr[i]`. If no such element exists, set `LS[i] = 0`.
- Right Smaller (`RS[i]`): The nearest smaller element to the right of `arr[i]`. If no such element exists, set `RS[i] = 0`.
- Absolute Difference: compute `|LS[i] - RS[i]|` for each element and return the maximum value.

**Example:**

**Input:** `arr[] = {2, 4, 8, 7, 7, 9, 3 }`

**Process:**

- Left Smaller (`LS[]`): {0, 2, 4, 4, 4, 7, 2}
- Right Smaller (`RS[]`): {0, 3, 7, 3, 3, 3, 0}
- Absolute differences: `{|0-0|, |2-3|, |4-7|, |4-3|, |4-3|, |7-3|, |2-0|} = {0, 1, 3, 1, 1, 4, 2}`
- Maximum absolute difference = 4

**Output:** 4

**Constraints :** Solve the problem **O(n)** time complexity

**Function Prototype:** `int maxAbsDiff(int arr[],int size)`

**Task 02 (BackSpace String Comparison)****15 Marks**

Given two strings `s` and `t`, return true if they are equal when both are typed into empty text editors. '#' means a backspace character.

**Note that after backspacing an empty text, the text will continue empty.**

**Example:**

**Input:** `s = "ab#c", t = "ad#c"`

**Output:** true

**Explanation:** Both `s` and `t` become "ac".

**Constraints :** Solve the problem  **$O(n)$**  time complexity

**Function Prototype:** bool isEqual(string s, string t)

**Good Luck!**

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**Note:** You must complete all your tasks individually. Absolutely NO collaboration is allowed. Any case of plagiarism/cheating would result in 0 marks in sessional activities.