

Batch: A2 Roll. No.: 16010122041

Experiment:

Grade: AA / AB / BB / BC / CC / CD /DD

Title: Using virtual labs to understand the data structures

Objective: Use of virtual labs to understand the concepts and theory with examples and verify the same with practice questions.

Expected Outcome of Experiment:

CO	Outcome
CO1	Explain the different data structures used in problem solving
CO2	Apply linear and non-linear data structure in application development
CO3	Demonstrate sorting and searching methods.

Websites/books referred:

Abstract: the virtual lab experiments help in understanding how various data structures work. They also emphasize on some important applications of various data structures and enable students to get familiarized with how certain applications can benefit from the choice of data structures.



Assigned data structure: (Teacher would assign one of the following to one student)

- 1. Stack https://ds1-iiith.vlabs.ac.in/exp/stacks-queues/stacks/stackdemo.html
- 2. Infix and postfix https://ds1-iiith.vlabs.ac.in/exp/infix-postfix/evaluation-of-postfix-expressions/postfix_eval.html
- 3. Queue https://ds1-iiith.vlabs.ac.in/exp/stacks-queues/stacks/stackdemo.html
- 4. Bubble sort https://ds1-iiith.vlabs.ac.in/exp/bubble-sort/bub
- 5. Graph DFS https://ds1-iiith.vlabs.ac.in/exp/depth-first-search/index.html
- 6. Graph BFS https://ds1-iiith.vlabs.ac.in/exp/breadth-first-search/index.html
- 7. Binary search tree https://ds1-iiith.vlabs.ac.in/exp/binary-search-trees/bst-insert/bstInsert.html
- 8. Hash tables https://ds1-iiith.vlabs.ac.in/exp/hash-tables/quadratic-probing/qp_practice.html
- 9. Linked list https://ds1-iiith.vlabs.ac.in/exp/linked-list/singly-linked-list/sllpractice.html

Aim / learning objective of the assigned expt: Bubble Sort (4)

The aim of the virtual lab experiment on bubble sort is to explore how the bubble sort algorithm functions and assess its sorting performance.

Concept and algorithm of the application/activity followed:

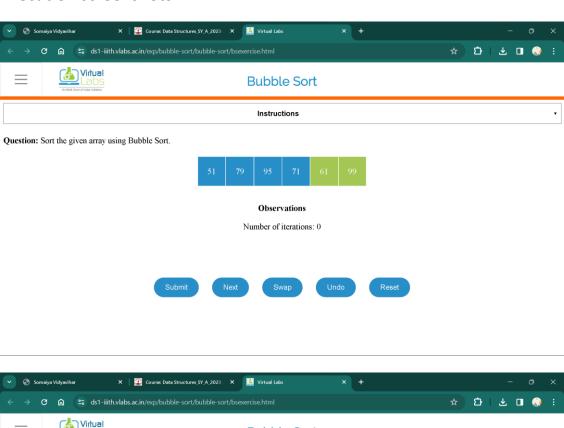
Bubble sort is a simple sorting algorithm that repeatedly compares and swaps adjacent elements in a list until the largest element "bubbles up" to its correct position at the end. This process is repeated until the entire list is sorted. While easy to understand, bubble sort is not efficient for large lists, and more efficient sorting algorithms are preferred for practical applications.

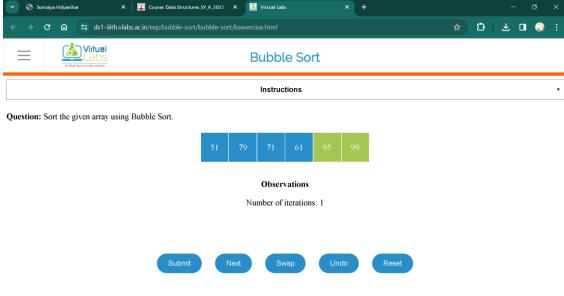


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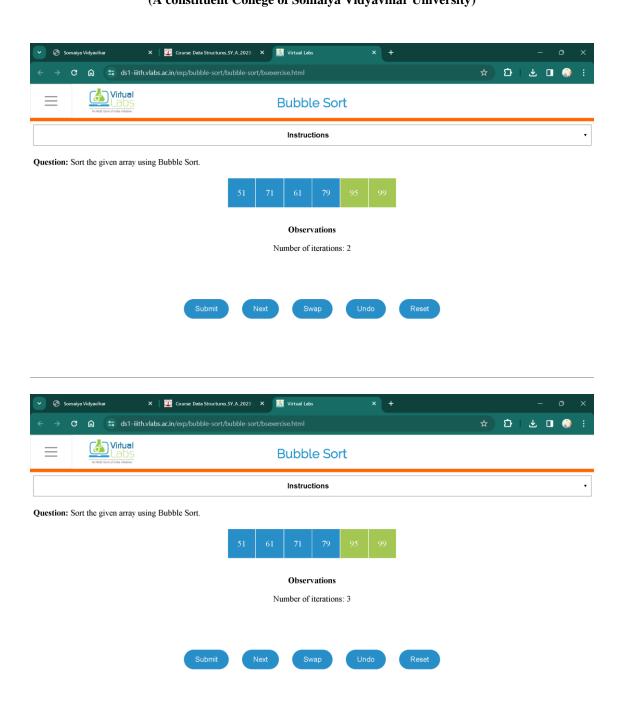
(A constituent College of Somaiya Vidyavihar University)

Execution screenshots:

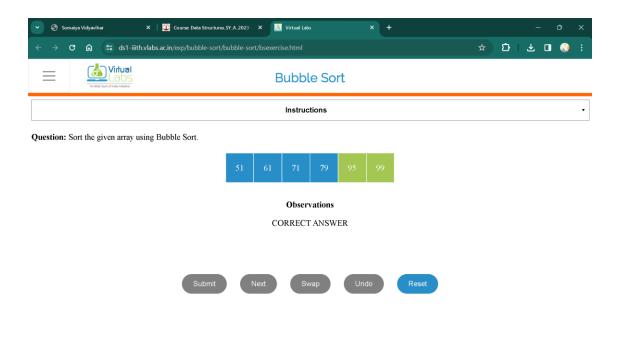












Conclusion and your take away after performing the virtual lab experiment: -

Bubble sort is a simple sorting algorithm that repeatedly swaps adjacent elements until the list is sorted. The experiment underscores the importance of understanding sorting algorithms and their efficiency.