



K. J. Somaiya College of Engineering, Mumbai-77
(A constituent College of Somaiya Vidyavihar University)

Batch: A3 **Roll. No.: 16010121051**

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:

- 1.
- 2.
- 3.

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.



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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/bubble-sort/bsexercise.html>
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:

To implement and test bubble sort on vlab.

Concept and algorithm of the application/activity followed:

Bubble sort.



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Demo execution screenshots:

Virtual Labs

Bubble Sort

Instructions

Question: Sort the given array using Bubble Sort.

11	22	26	56	58	77
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Observations

CORRECT ANSWER

Submit Next Swap Undo Reset



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Practice problem screenshots:

Virtual Labs
An Ideal Space of Virtual Learning

Bubble Sort

Instructions

11	41	59	22	16	52	10	72
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Observations
Correct!

Next Swap Reset

Virtual Labs
An Ideal Space of Virtual Learning

Bubble Sort

Instructions

11	16	22	41	10	52	59	72
----	----	----	----	----	----	----	----

Observations
Correct!

Next Swap Reset



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Bubble Sort

Instructions

10	11	16	22	41	52	59	72
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Observations
Correct!

Next

Swap

Reset

Quiz screenshots:



HOME PARTNERS CONTACT

Recap

Pretest

Bubble Sort

Aim

Concept

Algorithm

Demo

Practice

Exercise

Quiz

Optimized Bubble Sort

Analysis

Posttest

Further Readings/References

Feedback

Choose difficulty:

☒ Beginner

☒ Intermediate

☒ Advanced

1. Which of the following statements is true (assume ascending sort order)?

☐ a. After T iterations, atleast T of the smallest elements will be in their correct positions.

☐ b. After T iterations, atleast T random elements will be in their correct positions.

☐ c. After T iterations, a random number of elements will be in their correct positions.

☒ d. After T iterations, atleast T of the largest elements will be in their correct positions.

2. To sort an array in descending order, when will we swap two adjacent elements under consideration?

☒ a. When the ith element is lesser than the (i + 1)th element.

☐ b. When the ith element is equal to the (i + 1)th element.

☐ c. When the ith element is greater than the (i + 1)th element.

☐ d. None of the above.

3. Consider the following array:
A = [g, -1, -10, g', 2]

Note that the ' ' is used to mark a distinction between the two g's in order to keep track of their order while sorting. Which of the following represents the steps in sorting the above array (assume ascending order)?

☒ a. [g, -1, -10, g', 2] → [-1, -10, g, 2, g'] → [-10, -1, 2, g, g'] → [-10, -1, 2, g, g']

☐ b. [g, -1, -10, g', 2] → [-1, -10, g', 2, g] → [-10, -1, 2, g, g'] → [-10, -1, 2, g, g']

☐ c. [g, -1, -10, g', 2] → [-1, -10, 2, g, g'] → [-10, -1, 2, g, g'] → [-10, -1, 2, g, g']

☐ d. [g, -1, -10, g', 2] → [g, -1, g', 2, -10] → [g, g', 2, -1, -10] → [g, g', 2, -1, -10] → [g, g', 2, -1, -10]

Submit Quiz



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Conclusion and your take away after performing the virtual lab experiment: -
Implemented bubble sort successfully with help of great ui and options by vlab.