

Bubble Sort – Practice Set

◆ **Easy–Medium**

6. Dry run Bubble Sort on the array: [7, 4, 5, 2].
7. Show how Bubble Sort sorts: [10, 30, 20, 40, 50].
8. Perform Bubble Sort on: [8, 2, 6, 3, 1].
9. Sort [12, 11, 15, 5, 6] step by step using Bubble Sort.
10. Dry run Bubble Sort on: [25, 20, 35, 30, 10].
11. Apply Bubble Sort on the array: [9, 8, 7, 6, 5].
12. Show Bubble Sort passes on: [4, 1, 3, 9, 7].
13. Perform Bubble Sort on: [14, 18, 12, 16, 10].
14. Dry run Bubble Sort for: [2, 2, 1, 3, 1].
15. Show Bubble Sort working on: [100, 50, 70, 20, 90].

◆ **Advanced**

16. Dry run Bubble Sort on: [15, 12, 18, 6, 9, 3, 20].
 - Show array after each pass and mention in which pass the largest element reaches its correct position.
17. Perform Bubble Sort on: [5, 3, 8, 3, 2, 5, 1].

- Check if Bubble Sort is **stable** by observing duplicates.
18. Sort the characters of the string "BUBBLE" using Bubble Sort.
- Write array after each pass.
19. Apply Bubble Sort step by step on: [9, 8, 7, 6, 5, 4, 3, 2, 1].
- Count **comparisons** and **swaps** made.
20. Dry run Bubble Sort on: [2, 3, 5, 7, 6, 8, 9, 10].
- Explain why **optimized Bubble Sort with swapped flag** stops early.
21. Find total **passes and swaps** for Bubble Sort on [4, 2, 6, 1, 3].
22. Given [11, 14, 2, 7, 6, 3], show which element "bubbles up" after each pass.
23. Apply Bubble Sort on: [45, 12, 89, 33, 90, 21].
- Check if it preserves relative order of numbers with same tens digit.
24. Sort the array [0, -5, 3, -2, 8, -1] using Bubble Sort.
- Show step by step and explain handling of negatives.
25. A teacher records scores of 8 students: [55, 72, 55, 40, 90, 85, 40, 60].
- Use Bubble Sort to sort in ascending order.
 - Assign ranks after sorting.
 - Discuss how **stability** affects students with same marks.

◆ Coding Practice

26. Write a program to implement Bubble Sort in C++ / Java / Python.
27. Modify Bubble Sort to **sort in descending order**.
28. Implement Bubble Sort with **swapped flag optimization** (stop early if already sorted).
29. Count the total **number of swaps** Bubble Sort makes for [5, 1, 4, 2, 8].
30. Compare Bubble Sort with Insertion Sort in terms of **time complexity and efficiency**.

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