



#20
DAY

C++ COMPLETE BOOTCAMP

INSPIRE CLUB, MANIT BHOPAL

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BRINGS

C++

Complete
Bootcamp

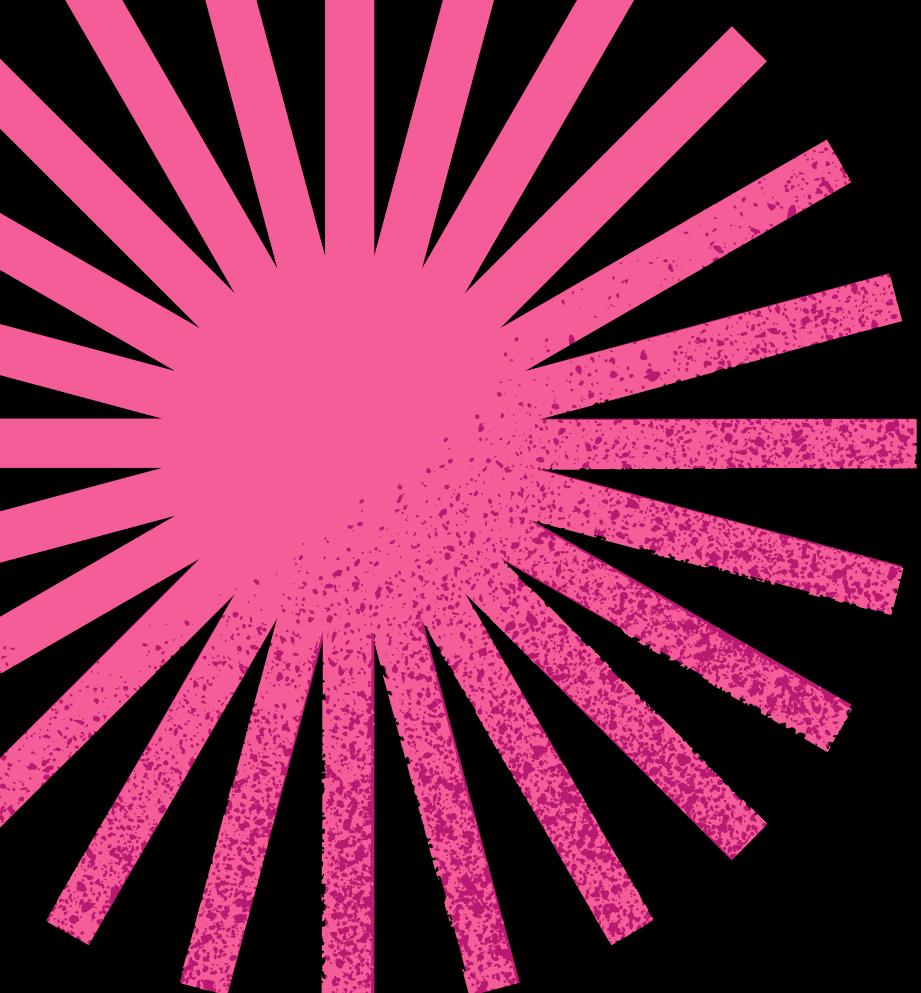


Learn How To Apply Problem Solving Skills

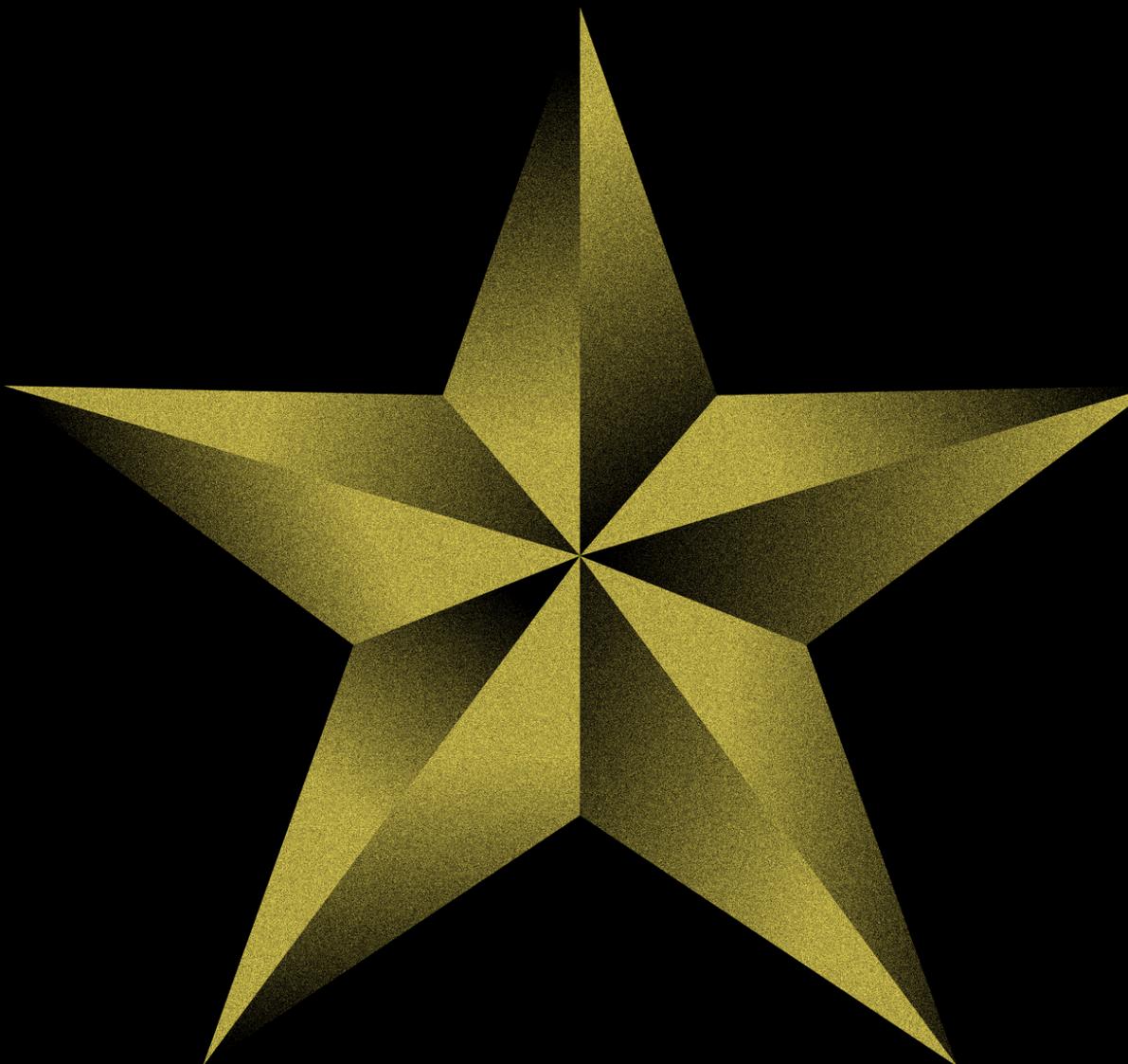
Hello CPPBuddies

DAY #20

Welcome
To
C++ COMPLETE BOOTCAMP
Your Guide To A Solid Foundation in C++
Let us begin



Introduction To Sorting & Searching



Searching

- 1. Linear Searching**
- 2. Binary Searching**

Sorting

- 1. Bubble Sorting**
- 2. Selection Sort**

Searching:

Searching is the process of finding a given value position in a list of values.

It decides whether a search key is present in the data or not.

It is the algorithmic process of finding a particular item in a collection of items.

Linear Search

In computer science, a linear search or sequential search is a method for finding an element within a list.

It sequentially checks each element of the list until a match is found or the whole list has been searched.

- Class: Search algorithm
- Worst-case space complexity: $O(1)$ iterative
- Best-case performance: $O(1)$

Binary Search

Binary search is a fast search algorithm with run-time complexity of $O(\log n)$.

This search algorithm works on the principle of divide and conquer.

For this algorithm to work properly, the data collection should be in the sorted form.

How this works

- **Binary search looks for a particular item by comparing the middle most item of the collection.**
- **If a match occurs, then the index of item is returned.**
- **If the middle item is greater than the item, then the item is searched in the sub-array to the left of the middle item.**
- **Otherwise, the item is searched for in the sub-array to the right of the middle item.**
- **This process continues on the sub-array as well until the size of the subarray reduces to zero.**

DEMO

Sorting:

Sorting refers to arranging data in a particular format.

Sorting algorithm specifies the way to arrange data in a particular order.

Most common orders are in numerical or lexicographical order.

Bubble Sort

Bubble sort is a simple sorting algorithm.
This sorting algorithm is comparison-based
algorithm in which each pair of adjacent
elements is compared and the elements are
swapped if they are not in order.
This algorithm is not suitable for large data sets

First pass

7	6	4	3
---	---	---	---



6	7	4	3
---	---	---	---



6	4	7	3
---	---	---	---



6	4	3	7
---	---	---	---

Second pass

6	4	3	7
---	---	---	---



4	6	3	7
---	---	---	---



4	3	6	7
---	---	---	---

Third pass

4	3	6	7
---	---	---	---



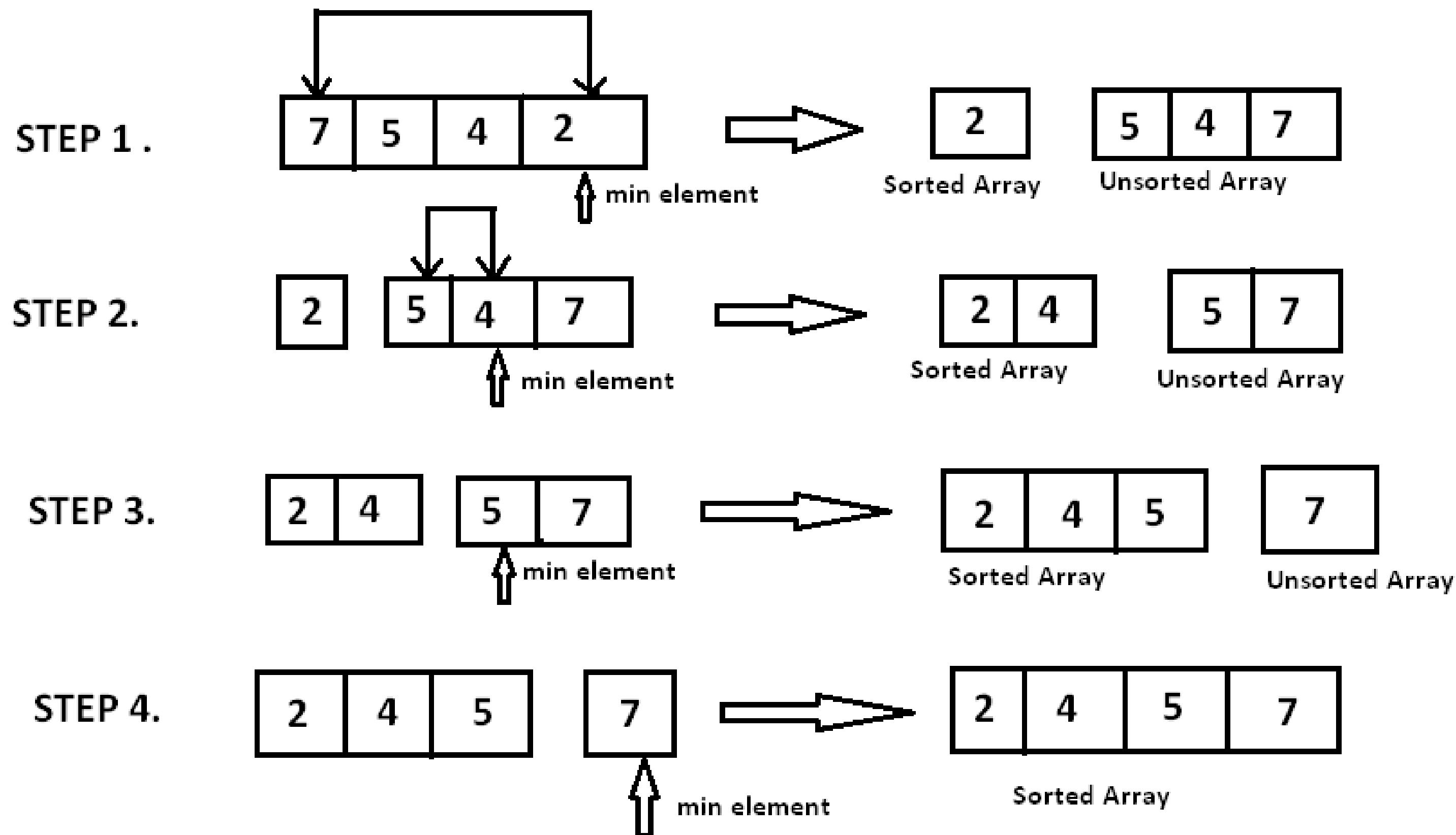
3	4	6	7
---	---	---	---

Selection Sort

Selection sort is a simple sorting algorithm.

This sorting algorithm is an in-place comparison-based algorithm in which the list is divided into two parts, the sorted part at the left end and the unsorted part at the right end. Initially, the sorted part is empty and the unsorted part is the entire list.

The smallest element is selected from the unsorted array and swapped with the leftmost element, and that element becomes a part of the sorted array. This process continues moving unsorted array boundary by one element to the right.





DEMO

SORTING & SEARCHING



THANK YOU



keep calm,
wear mask,
and
study hard



whoami

AKASH MAJI
[TCS DIGITAL]
Your Mentor