# CodeShows Module - 3

Topics
- Sorting
- Searching
- Prefix Arrays
- Difference Arrays

# Sorting

**Bubble Sort**

**Insertion Sort**

**Quick Sort**

**Merge Sort**

**Heap Sort**

**Library Implementations**



Sorting Algorithms

# Sorting - Related Tasks

- [Sort elements by frequency](#)
- [Count all distinct pairs with difference equal to k](#)
- [Find number of pairs (x, y) in an array such that x^y > y^x](#)
- [Count Inversions in an array](#) (Merge Sort)

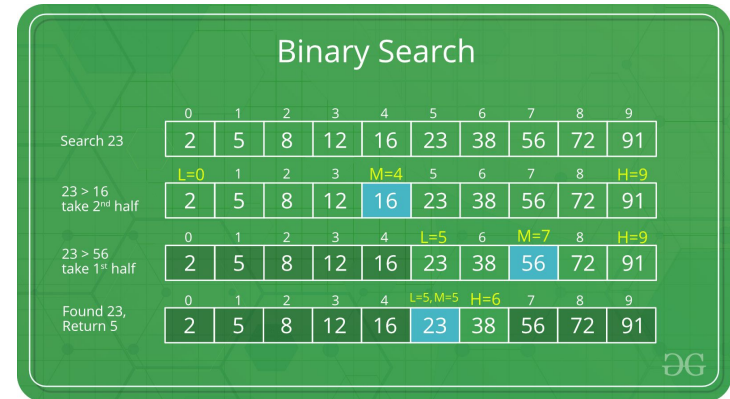# Searching

[Linear Search](#)

[Binary Search](#)

[Binary Search](#) **(Video)**

[Binary Search Implementations](#)

[Ternary Search](#)

# Searching - Related Tasks

- [Painter's Partition Problem](#)
- [Matrix Median](#)
- [Square Root of an Integer](#)
- [Search in Rotated Sorted Array](#)
- [CF1440A - Buy the String](#)
- [CF1408C - Discrete Acceleration](#)
- [ABC172C - Tsundoku](#)
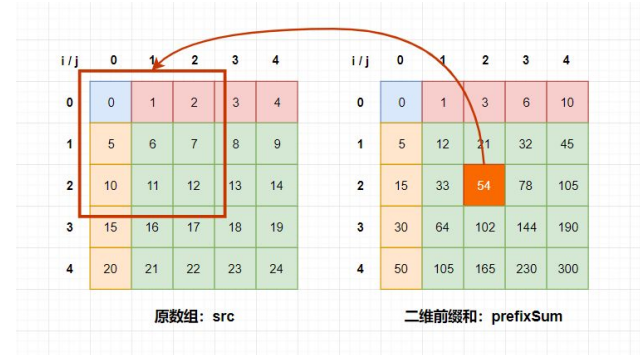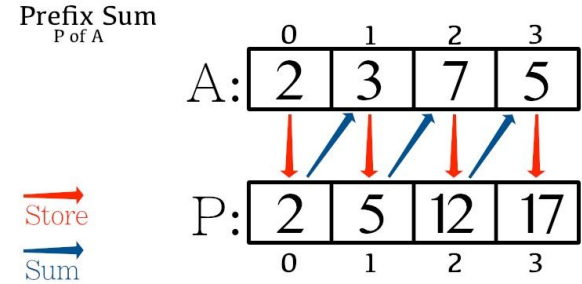- [SPOJ AGGRCOW](#)

# Prefix Array

**Prefix Sum Array 1**

**Prefix Sum Array 2**

**Prefix Product Array**

**Prefix Max Array**

**Range Sum Queries**

**Submatrix Sum Queries**

# Prefix Array - Related Tasks

- [Subarray with Given Sum](#)
- [CF433B - Kuriyama Mirai's Stones](#)
- [CF363B - Fence](#)
- [CF1443C - The Delivery Dilemma](#)
- [CF835C - Star Sky](#)

# Difference Array

[Difference Array - Range Updates](#)

[Difference Array](#)

```python
for i in range(len(A)):
    if i==0:
        diff[i] = A[i]
    else:
        diff[i] = A[i] - A[i-1]
```

# Difference Array - Related Tasks

- CF295A - Greg and Array
- CF816B - Karen and Coffee
- CF276C - Little Girl and Maximum Sum
- CF602B - Approximating a Constant Range
- CF1355C - Count the Triangles