

## Q1. Reverse a String

```
def reverse_string(s: str) -> str:
    return s[::-1]

print(reverse_string("hello")) # 'olleh'
```

**Complexity:** Time:  $O(n)$ , Space:  $O(n)$

## Q2. Check if a String is Palindrome

```
def is_palindrome(s: str) -> bool:
    return s == s[::-1]

print(is_palindrome("madam")) # True
```

**Complexity:** Time:  $O(n)$ , Space:  $O(n)$

## Q3. Find Maximum Element in Array

```
def find_max(arr):
    return max(arr)

print(find_max([1,2,3,4,5])) # 5
```

**Complexity:** Time:  $O(n)$ , Space:  $O(1)$

## Q4. Find Minimum Element in Array

```
def find_min(arr):
    return min(arr)

print(find_min([1,2,3,4,5])) # 1
```

**Complexity:** Time:  $O(n)$ , Space:  $O(1)$

## Q5. Find Second Largest Element

```
def second_largest(arr):
    arr = list(set(arr))
    arr.sort()
    return arr[-2]

print(second_largest([10,20,4,45,99])) # 45
```

**Complexity:** Time:  $O(n \log n)$ , Space:  $O(n)$

## Q6. Sum of Elements in Array

```
def sum_array(arr):
    return sum(arr)

print(sum_array([1,2,3,4])) # 10
```

**Complexity:** Time:  $O(n)$ , Space:  $O(1)$

## Q7. Binary Search

```
def binary_search(arr, target):
    l, r = 0, len(arr)-1
    while l <= r:
        mid = (l+r)//2
```

```

        if arr[mid] == target:
            return mid
        elif arr[mid] < target:
            l = mid+1
        else:
            r = mid-1
    return -1

```

```
print(binary_search([1,2,3,4,5], 4)) # 3
```

**Complexity:** Time:  $O(\log n)$ , Space:  $O(1)$

## Q8. Linear Search

```

def linear_search(arr, target):
    for i, val in enumerate(arr):
        if val == target:
            return i
    return -1

```

```
print(linear_search([1,2,3], 2)) # 1
```

**Complexity:** Time:  $O(n)$ , Space:  $O(1)$

## Q9. Check if Array is Sorted

```

def is_sorted(arr):
    return all(arr[i] <= arr[i+1] for i in range(len(arr)-1))

```

```
print(is_sorted([1,2,3,4])) # True
```

**Complexity:** Time:  $O(n)$ , Space:  $O(1)$

## Q10. Find Factorial

```

def factorial(n):
    return 1 if n==0 else n*factorial(n-1)

```

```
print(factorial(5)) # 120
```

**Complexity:** Time:  $O(n)$ , Space:  $O(n)$