Subarrays Sheets

1. Total Number of Subarrays

Problem Statement

Given an integer N representing the number of elements in an array, find the total number of subarrays that can be generated from it.

Formula

Total Subarrays=N×(N+1)2\text{Total Subarrays} = \frac{N \times (N + 1)}{2}Total Subarrays=2N×(N+1)

Input Format

- An integer N, the size of the array.

Output Format

- Print the total number of subarrays possible.

Example

Input:

N = 4

Output:

10

Explanation

For an array of size 4 → [a, b, c, d],
 Total subarrays = 4 × (4 + 1) / 2 = 10.

2. Print All the Values of Subarrays

Problem Statement

Given an array of integers, print all possible subarrays and their elements.

Input Format

- First line: integer N (size of array)

- Second line: N integers (array elements)

Output Format

- Print all subarrays, one per line.

Example

Input:

5
1 2 3 4 5

Output:

1
1 2
1 2 3
1 2 3 4
1 2 3 4 5
2
2 3
2 3 4
2 3 4 5
3
3 4
3 4 5
4
4 5
5

Explanation

All continuous segments of the array are printed in order.

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3. Find the Sum of Elements in a Given Subarray

Problem Statement

Given an integer array and two indices L and R, find the sum of elements between those indices (inclusive).

Input Format

- First line: integer N

- Second line: N space-separated integers

- Third line: two integers L and R (1-based index)

Output Format

- Print the sum of elements from index L to R.

Example

Input:

```
5
1 2 3 4 5
2 4
```

Output:

```
9
```

Explanation

Subarray from index 2 to 4 → [2, 3, 4]
 Sum = 2 + 3 + 4 = 9

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4. Print Sum of Every Single Subarray

Problem Statement

Given an array of integers, print the sum of all possible subarrays.

Input Format

- First line: integer N

- Second line: N integers (array elements)

Output Format

- Print the sum of each subarray, one per line.

Example

Input:

```
3
1 2 3
```

Output:

```
1
3
6
2
5
3
```

Explanation

All subarrays are:
[1] → 1
[1,2] → 3
[1,2,3] → 6
[2] → 2
[2,3] → 5
[3] → 3

5. Kadane's Algorithm

Problem Statement

Given an integer array nums, find the **subarray with the largest sum**, and return its sum.

Input Format

- First line: integer N

- Second line: N integers (array elements)

Output Format

- Print the maximum subarray sum.

Example

Input:

8
-2 1 -3 4 -1 2 1 -5 4

Output:

6

Explanation

The subarray [4, -1, 2, 1] has the largest sum = 6.

6. Contribution Technique – Sum of All Subarray Sums

Problem Statement

Given an integer array, find the **sum of all subarray sums** using the **Contribution Technique**.

Concept

Each element at index i contributes to several subarrays:

$$\text{Contribution of element i} = \text{arr[i]} \times (i + 1) \times (N - i)$$

Input Format

- First line: integer N

- Second line: N integers (array elements)

Output Format

- Print the total sum of all subarray sums.

Example

Input:

```
3
1 2 3
```

Output:

```
20
```

Explanation

- For element 1: $1 \times (1) \times (3) = 3$

- For element 2: $2 \times (2) \times (2) = 8$

- For element 3: $3 \times (3) \times (1) = 9$
  Total $= 3 + 8 + 9 = $ **20**