Educational DP Contest AtCoder N - Slimes

Time limit: 1.0s **Memory limit:** 1G

There are N slimes lining up in a row. Initially, the i-th slime from the left has a size of a_i.

Taro is trying to combine all the slimes into a larger slime. He will perform the following operation repeatedly until there is only one slime:

- Choose two adjacent slimes, and combine them into a new slime. The new slime has a size of $x + y$, where x and y are the sizes of the slimes before combining them. Here, a cost of $x + y$ is incurred. The positional relationship of the slimes does not change while combining slimes.

Find the minimum possible total cost incurred.

Constraints

- All values in input are integers.
- $2 \leq N \leq 400$
- $1 \leq a_i \leq 10^9$

Input Specification

The first line will contain the integer N.

The next line will contain N integers, $a_1, a_2, \ldots, a_N$.

Output Specification

Print the minimum possible total cost incurred.

Note: The answer may not fit into a 32-bit integer type.

Sample Input 1

```
4
10 20 30 40
```

Sample Output 1

```
190
```

Explanation For Sample 1

Taro should do as follows (slimes being combined are shown in bold):

- (**10**, **20**, 30, 40) → (**30**, 30, 40)
- (**30**, **30**, 40) → (**60**, 40)
- (**60**, **40**) → (**100**)

Sample Input 2

```
5
10 10 10 10 10
```

Sample Output 2

```
120
```

Explanation For Sample 2

Taro should do, for example, as follows:

- (**10**, **10**, 10, 10, 10) → (**20**, 10, 10, 10)
- (20, **10**, **10**, 10) → (20, **20**, 10)
- (20, **20**, **10**) → (20, **30**)
- (**20**, **30**) → (**50**)

Sample Input 3

```
3
1000000000 1000000000 1000000000
```

Sample Output 3

```
5000000000
```

Sample Input 4

```
6
7 6 8 6 1 1
```

Sample Output 4

```
68
```

Explanation For Sample 4

Taro should do, for example, as follows:

- (7, 6, 8, 6, **1**, **1**) → (7, 6, 8, 6, **2**)
- (7, 6, 8, **6**, **2**) → (7, 6, 8, **8**)
- (**7**, **6**, 8, 8) → (**13**, 8, 8)
- (13, **8**, **8**) → (13, **16**)
- (**13**, **16**) → (**29**)