

N - Slimes

Time Limit: 2 sec / Memory Limit: 1024 MB

Score : 100 points

Problem Statement

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

Input is given from Standard Input in the following format:

```
N
a1 a2 ... aN
```

Output

Print the minimum possible total cost incurred.

Sample Input 1

Copy

```
4
10 20 30 40
```

Copy

Sample Output 1

[Copy](#)

```
190
```

[Copy](#)

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

[Copy](#)

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

[Copy](#)

Sample Output 2

[Copy](#)

```
120
```

[Copy](#)

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

[Copy](#)

```
3
10000000000 10000000000 10000000000
```

[Copy](#)

Sample Output 3

[Copy](#)

```
50000000000
```

[Copy](#)

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

Sample Input 4

[Copy](#)[Copy](#)

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

Sample Output 4

Copy

```
68
```

Copy

Taro should do, for example, as follows:

- $(7, 6, 8, 6, \mathbf{1}, \mathbf{1}) \rightarrow (7, 6, 8, 6, \mathbf{2})$
- $(7, 6, 8, \mathbf{6}, \mathbf{2}) \rightarrow (7, 6, 8, \mathbf{8})$
- $(\mathbf{7}, \mathbf{6}, 8, 8) \rightarrow (\mathbf{13}, 8, 8)$
- $(13, \mathbf{8}, \mathbf{8}) \rightarrow (13, \mathbf{16})$
- $(\mathbf{13}, \mathbf{16}) \rightarrow (\mathbf{29})$