



The Strange Function

locked

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Problem

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One of the most important skills a programmer needs to learn early on is the ability to pose a problem in an abstract way. This skill is important not just for researchers but also in applied fields like software engineering and web development.

You are able to solve most of a problem, except for one last subproblem, which you have posed in an abstract way as follows: Given an array consisting of n integers $[a_1, a_2, \dots, a_n]$, define

$$f(l, r) = \gcd(a_l, a_{l+1}, \dots, a_r) \cdot \left(\left(\sum_{i=l}^r a_i \right) - \max(a_l, a_{l+1}, \dots, a_r) \right).$$

For example, for an input array $[10, -5, 5, 20]$, a subsegment $f(1, 1)$ would be computed as follows:

Input array = $[10, -5, 5, 20]$

(l, r)	GCD	Sum	Max	$f(l, r)$
$(1, 1)$	10	10	10	0

What is $\max_{1 \leq l \leq r \leq n} f(l, r)$, i.e., the maximum value of $f(l, r)$ among all subsegments $[l, r]$?

Complete the function `maximumValue` which takes an integer array as input and returns the maximum value of f among all subsegments $[l, r]$.

Note that:

- $\gcd(x, y) = \gcd(|x|, |y|)$
- $\gcd(x, 0) = \gcd(0, x) = |x|$

Input Format

The first line contains a single integer n .

The second line contains n space-separated integers a_1, a_2, \dots, a_n .

Constraints

- $1 \leq n \leq 50000$
- $-10^6 \leq a_i \leq 10^6$

Subtasks

For 15% of the total score:

- $1 \leq n \leq 1000$

Output Format

Print a single integer denoting the answer.

Sample Input 0

```
4
10 -5 5 20
```

Sample Output 0

50

Explanation 0

The maximum value occurs at $f(1,4) = 50$ as shown below.

Input array = [10, -5, 5, 20]

(l, r)	GCD	Sum	Max	f (l, r)
(1, 1)	10	10	10	0
(1, 2)	5	5	10	-25
(1, 3)	5	10	10	0
(1, 4)	5	30	20	50
(2, 2)	5	-5	-5	0
(2, 3)	5	0	5	-25
(2, 4)	5	20	20	0
(3, 3)	5	5	5	0
(3, 4)	5	25	20	25
(4, 4)	20	20	20	0

Sample Input 1

5
7 12 24 6 5

Sample Output 1

144



Explanation 1



The maximum value occurs at $f(2,3) = 144$.

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Submissions: 562
Max Score: 70
Difficulty: Hard

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C++14  

```
1 #include <cmath>
2 #include <cstdio>
3 #include <vector>
4 #include <iostream>
5 #include <algorithm>
6 using namespace std;
7
8
9 int main() {
10     /* Enter your code here. Read input from STDIN. Print output to STDOUT */
11     return 0;
12 }
```

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Run Code

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