Problem 2 - ADA Removal Game (Programming) (15 points)

Problem Description

Consider an array A containing N elements. For each operation, you can choose 2 or 3 contiguous elements, whose pairwise greatest common divisor is greater than 1, and remove them from the array. After removal, the remaining parts of the array are concatenated. Meanwhile, you earn points by doing this operation, and the point is calculated by adding up the greatest common divisor of each pair of adjacent elements you removed.

Formally, consider an array A of length N, you can choose two integers i, k such that $1 \leq i \leq i+k-1 \leq N$, $k = \{2, 3\}$ where $\gcd(A_x, A_y) > 1, \forall i \leq x \leq y \leq i+k-1$. Remove $A_i, \ldots, A_{i+k-1}$ from the array and get $\sum_{p=i}^{i+k-2} \gcd(A_p, A_{p+1})$ points. After the operation, the new array becomes $A_1, \ldots, A_{i-1}, A_{i+k}, \ldots, A_N$ of length $N - k$.

You can perform the above operation multiple times until the array is empty. Please find the maximum total points you can receive to eliminate the entire array, and determine whether it is possible to do so.

For example, array $[2, 3, 12, 6, 4]$ can be totally eliminated by removing $(3, 12, 6)$ and $(2, 4)$ in order, which gets 11 points. Or, it can also be removed by $(3, 12)$ and $(2, 6, 4)$, which gets 7 points. There is no other way to remove the entire array. Hence, the answer should be the greater one 11.

Input

The first line contains an integer indicating N, where $2 \leq N \leq 500$.

The second line contains N space-separated positive integers a_i, where $2 \leq a_i \leq 10^9$.

Test Group 0 (0 %)

- Sample Input

Test Group 1 (10 %)

- $N \leq 10$

Test Group 2 (20 %)

- $2 | a_i, \forall i$

Test Group 3 (30 %)

- $N \leq 100$

Test Group 4 (40 %)

- No other constraints.

Output

Please output an integer indicating the maximum points. If it is impossible to eliminate the entire array, output -1.

Sample Input 1

```
5
2 3 12 6 4
```

Sample Output 1

```
11
```

Sample Input 2

```
5
10 9 3 10 10
```

Sample Output 2

```
23
```

Sample Input 3

```
6
2 3 6 12 6 4
```

Sample Output 3

```
13
```

Sample Input 4

```
5
2 3 8 6 4
```

Sample Output 4

```
-1
```