

DB & GCD

Db hates mathematics a lot. One day his mathematics teacher gives him an assignment. So he is asking for help to complete his assignment. Help Db as he is busy at SPOJ. The statement of assignment question is:

You are given an array **A** of integer of Size **N**. Now your task is to find the maximum length of a contiguous subsequence among all beautiful subsequences. A beautiful subsequence is defined as a subsequence with gcd 1.

Note: GCD of subsequence means gcd of all element present in subsequence.

Input

First line of input contains $1 \leq T \leq 100$ number of test cases.

The first line of each test cases contains a number **N** ($2 \leq N \leq 100000$) Next line contains the elements of array **A** ($1 \leq A[i] \leq 1e9$)

Output

For every test case print maximum length of a contiguous subsequence if such type of subsequence does not exist, print **-1**.

Example

Input:

2

2

2 4

2

1 1

Output:

-1

2