Problem E
Square

Input: Standard Input
Output: Standard Output

Given **n** integers you can generate $\mathbf{2^n-1}$ non-empty subsets from them. Determine for how many of these subsets the product of all the integers in that is a perfect square. For example for the set {4,6,10,15} there are 3 such subsets. {4}, {6,10,15} and {4,6,10,15}. A perfect square is an integer whose square root is an integer. For example 1, 4, 9, 16,…. .

Input

Input contains multiple test cases. First line of the input contains **T(1≤T≤30)** the number of test cases. Each test case consists of 2 lines. First line contains **n(1≤n≤100)** and second line contains **n** space separated integers. All these integers are between 1 and 10^15. None of these integers is divisible by a prime greater than 500.

Output

For each test case output is a single line containing one integer denoting the number of non-empty subsets whose integer product is a perfect square. The input will be such that the result will always fit into signed 64 bit integer.

Sample Input	Output for Sample Input
4 3 2 3 5 3 6 10 15 4 4 6 10 15 3 2 2 2	0 1 3 3

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