C. Gellyfish and Flaming Peony

time limit per test: 2 seconds
memory limit per test: 512 megabytes

Gellyfish hates math problems, but she has to finish her math homework:

Gellyfish is given an array of n positive integers $a_1, a_2, \ldots, a_n$.

She needs to do the following two-step operation until all elements of a are equal:

1. Select two indexes i, j satisfying $1 \leq i, j \leq n$ and $i \neq j$.
2. Replace a_i with $\gcd(a_i, a_j)$.

Now, Gellyfish asks you for the minimum number of operations to achieve her goal.

It can be proven that Gellyfish can always achieve her goal.

Input

Each test contains multiple test cases. The first line contains the number of test cases t ($1 \leq t \leq 5000$). The description of the test cases follows.

The first line of each test case contains a single integer n ($1 \leq n \leq 5000$) — the length of the array.

The second line of each test case contains n integers $a_1, a_2, \ldots, a_n$ ($1 \leq a_i \leq 5000$) — the elements of the array.

It is guaranteed that the sum of n over all test cases does not exceed 5000.

Output

For each test case, output a single integer — the minimum number of operations to achieve her goal.

Example

input
3 3 12 20 30 6 1 9 1 9 8 1 3 6 14 15

output
4 3 3

Note

In the first test case, the following is a way that minimizes the number of operations:

1. Choose $i = 3$ and $j = 2$ and replace a_3 with $\gcd(a_3, a_2) = \gcd(30, 20) = 10$, then a becomes $[12, 20, 10]$.
2. Choose $i = 1$ and $j = 3$ and replace a_1 with $\gcd(a_1, a_3) = \gcd(12, 10) = 2$, then a becomes $[2, 20, 10]$.
3. Choose $i = 2$ and $j = 1$ and replace a_2 with $\gcd(a_2, a_1) = \gcd(20, 2) = 2$, then a becomes $[2, 2, 10]$.
4. Choose $i = 3$ and $j = 1$ and replace a_3 with $\gcd(a_3, a_1) = \gcd(10, 2) = 2$, then a becomes $[2, 2, 2]$.

Copy Copy

Codeforces Round 1028 (Div. 2)

Contest is running

00:03:09

Contestant

→ Submit?

Language: GNU G++23 14.2 (64 bit, ms

Choose file: Choose File No file chosen

Be careful: there is 50 points penalty for submission which fails the pretests or resubmission (except failure on the first test, denial of judgement or similar verdicts). "Passed pretests" submission verdict doesn't guarantee that the solution is absolutely correct and it will pass system tests.

Submit

→ Last submissions

Submission	Time	Verdict
322291312	May/31/2025 19:30	**Pretests passed**
322289149	May/31/2025 19:27	Wrong answer on pretest 9
322286761	May/31/2025 19:23	Wrong answer on pretest 9
322284692	May/31/2025 19:20	Wrong answer on pretest 9
322283273	May/31/2025 19:18	Wrong answer on pretest 9
322274993	May/31/2025 19:05	Wrong answer on pretest 9
322273138	May/31/2025 19:02	Wrong answer on pretest 9
322223162	May/31/2025 18:03	Wrong answer on pretest 9
322219070	May/31/2025 17:59	Wrong answer on pretest 9
322215512	May/31/2025 17:56	Wrong answer on pretest 9

→ Score table

	Score
Problem A	268
Problem B	402
Problem C	670
Problem D	1072
Problem E	1340
Problem F	1608
Successful hack	100
Unsuccessful hack	-50
Unsuccessful submission	-50
Resubmission	-50

* If you solve problem on 01:56 from the first attempt

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