C. Maximum GCD on Whiteboard

time limit per test: 2 seconds
memory limit per test: 256 megabytes

You are given an integer k and n positive integers $a_1, a_2, \ldots, a_n$ written on a whiteboard, where $1 \leq a_i \leq n$. You may perform the following operations:

- **Erase**: Choose an integer from the whiteboard and erase it. This operation can be performed at most k times.
- **Split**: Choose an integer $x \geq 3$ from the whiteboard. Split it into three positive integers x_1, x_2, and x_3 such that $x_1 + x_2 + x_3 = x$, and $1 \leq x_1 \leq x_2 \leq x_3$. Then, erase x from the whiteboard and write two new integers x_1 and x_3 on the whiteboard. Note that x_2 is **discarded** and **not** written on the whiteboard. This operation may be performed any number of times.

The *beauty* of a collection of integers b is defined as the greatest common divisor of all the elements in b. Formally, it is the largest integer d such that d divides x for every x that is an element of b.

Your task is to determine the maximum possible beauty of the integers on the whiteboard after performing at most k **Erase** operations and any number of **Split** operations.

DeepL 翻译

白板上有一个整数 k 和 n 个正整数 $a_1, a_2, \ldots, a_n$ ，其中 $1 \leq a_i \leq n$ 。您可以进行以下运算：

- 擦除**：从白板上选择一个整数并擦除。此操作最多可执行 k 次。
- 拆分**：从白板上选择一个整数 $x \geq 3$ 。将其拆分为三个正整数 x_1 、 x_2 和 x_3 ，即 $x_1 + x_2 + x_3 = x$ 和 $1 \leq x_1 \leq x_2 \leq x_3$ 。然后，擦去白板上的 x ，并在白板上写下两个新的整数 x_1 和 x_3 。注意， x_2 会被**丢弃**，不会被**写在白板上。此操作可以执行任意多次。

整数集合 b 的美定义为 b 中所有元素的最大公约数。从形式上看，它是最大的整数 d ，使得 d 除以 x 的每一个 x 都是 b 的元素。

你的任务是确定白板上的整数在进行最多 k 次**擦除**运算和 b 次**擦除**运算后的最大可能美度。**擦除**操作和任意数量的**分割**操作。

Input

Each test contains multiple test cases. The first line contains the number of test cases t ($1 \leq t \leq 10^4$). The description of the test cases follows.

The first line of each test case contains two integers n and k ($1 \leq n \leq 2 \cdot 10^5$, $0 \leq k \leq n - 1$) — the number of integers on the whiteboard, and the maximum number of **Erase** operations allowed.

The second line of each test case contains n integers $a_1, a_2, \ldots, a_n$ ($1 \leq a_i \leq n$) — the integers initially written on the whiteboard.

It is guaranteed that the sum of n over all test cases does not exceed $2 \cdot 10^5$.

DeepL 翻译

输入

Codeforces Round 1061 (Div. 2)
比赛进行中
01:54:35
Contestant

→ 提交?

语言: GNU G++17 7.3.0
选择文件: 选择文件 未选择文件
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.
提交

→ 评分表

	Score
Problem A	492
Problem B	738
Problem C	1476
Problem D	1968
Problem E	2706
Problem F1	3198
Problem F2	3198
Successful hack	100
Unsuccessful hack	-50
Unsuccessful submission	-50
Resubmission	-50

* If you solve problem on 00:04 from the first attempt

每个测试包含多个测试用例。第一行包含测试用例的数量 t（ $1 \le t \le 10^4$ ）。测试用例说明如下。

每个测试用例的第一行包含两个整数 n 和 k （ $1 \le n \le 2 \cdot 10^5$ 、{3884307}）。（ $1 \le n \le 2 \cdot 10^5$ ， $0 \le k \le n-1$)--白板上的整数个数，以及允许的最大**擦除**操作次数。

每个测试用例的第二行包含 n 个整数 $a_1, a_2, \ldots, a_n$（ $1 \le a_i \le \boldsymbol{n}$ ）- 最初写在白板上的整数。

保证所有测试用例中 n 的总和不超过 $2 \cdot 10^5$ 。

Output

For each test case, output a single integer representing the maximum beauty of the elements written on the whiteboard after performing the operations.

DeepL 翻译

输出

针对每个测试用例，输出一个整数，代表执行操作后白板上所写元素的最大美观度。

Example

input Copy

```
6
9 1
4 9 6 8 2 6 7 8 2
10 1
4 9 6 8 2 6 7 8 2 7
7 5
1 1 2 3 4 5 5
7 4
1 1 2 3 4 5 5
14 3
14 12 7 12 9 9 12 4 3 1 3 6 9 13
1 0
1
```

output Copy

```
2
1
5
1
3
1
```

Note

In the first test case, you may perform the following sequence of operations:

- **Erase** 7. The whiteboard now contains the integers $[4, 9, 6, 8, 2, 6, 8, 2]$.
- **Split** 9 into three integers 2, 3, and 4. 9 is erased from the whiteboard, and two new integers 2 and 4 are written. The whiteboard now contains the integers $[4, 2, 4, 6, 8, 2, 6, 8, 2]$.
- **Split** 8 into three integers 2, 2, and 4. 8 is erased from the whiteboard, and two new integers 2 and 4 are written. The whiteboard now contains the integers $[4, 2, 4, 6, 2, 4, 2, 6, 8, 2]$ (It does not matter which 8 **Split** is performed on as the ordering in the array does not matter).

The beauty of the integers on the whiteboard after the operations is 2 as it is the largest number that divides all the integers on the whiteboard (2, 4, 6, and 8). Note that the last operation is unnecessary — the beauty of the integers on the whiteboard after the second operation is already 2.

In the second test case, note that the **Erase** operation can only remove one occurrence of an integer, even if duplicates exist. Here, we are only able to erase one copy of 7, so there will still be one remaining 7 on the whiteboard. Hence, we are unable to perform the same sequence of operations as in the first test case.

In the third test case, we can erase integers 1, 1, 2, 3, and 4, leaving only $[5, 5]$ on the whiteboard. Since both numbers are 5, their greatest common divisor is 5, and the maximum beauty is 5.

DeepL 翻译

注

在第一个测试用例中，您可以执行以下操作顺序：

- 擦除** 7 。白板现在包含整数 $[4,9,6,8,2,6,8,2]$ 。
- 将 9 拆分为三个整数 2 、 3 和 4 。擦除白板上的 9 并写入两个新的整数 2 和 4 。现在白板上的整数是 $[4,\underline{2},\underline{4},6,8,2,6,8,2]$ 。
- 将 8 拆分为三个整数 2 ， 2 和 4 。从白板上擦除 8 ，写入两个新的整数 2 和 4 。现在白板上包含的整数是 $[4,2,4,6,\underline{2},\underline{4},2,6,8,2]$ （对哪个 8 进行**分割**并不重要）。由于数组中的排序并不重要，因此对哪个 8 执行**拆分**并不重要）。

运算后，白板上的整数美其名曰 2 ，因为它是除以白板上所有整数（ 2 、 4 、 6 和 8 ）的最大数字。请注意，最后一个运算是多余的，因为经过第二个运算后，白板上的整数之美已经是 2 。

在第二个测试案例中，请注意**擦除**操作只能擦除一个整数，即使存在重复的整数。在这里，我们只能擦除 7 的一个副本，因此白板上仍会有一个剩余的 7 。因此，我们无法执行与第一个测试用例相同的操作序列。

在第三个测试案例中，我们可以擦除整数 1 、 1 、 2 、 3 和 4 ，白板上只剩下 $[5,5]$ 。由于这两个数字都是 5 ，所以它们的最大公约数是 5 ，最大美是 5 。

GNU G++17 7.3.0

```
1
```

▶ 自定义测试数据(自动保存)