X



Course outline

How does an NPTEL online course work?

Week 0

Week 1

- Welcome and Initial Setup (unit?unit=27&lesson=67)
- Reversort (unit?unit=27&lesson=68)
- Engineering Reversort (unit?unit=27&lesson=69)
- Number Game (unit?unit=27&lesson=70)
- Will It Stop? (unit?unit=27&lesson=66)
- Quiz: Week 1: Assignment 1 (assessment?name=58)

# Week 1: Programming Assignment 1

**Due on 2021-08-19, 23:59 IST**

Swayam wants to play a game with you. He has an integer with him, **S**, but he has hid it from you. Instead, he has shared some information about **S**.

In particular, for every **i** such that **1 ≤ i ≤ N**, he has told you the value **⌊(i*S)/K⌋**. This is given to you as the array $A_1, A_2, ..., A_N$, where $A_i = ⌊(i*S)/K⌋$. He has also told you the value of **K**. But since he has not shared the value of **S**, you want to find the largest possible range **[L,R]** in which **S** could lie. That is, find the largest possible range **[L,R]** such that, for any integer **P ∈ [L,R]**, $A_i$ is equal to **⌊(i*P)/K⌋** for all **i**.

It is guaranteed that such a range always exists and is unique. You may read the sample test cases for more clarity.

Note that **⌊x⌋** denotes **floor(x)**, which is largest integer which is **≤ x**.

## Input

- The first line of the input contains a single integer **T** denoting the number of test cases.
- The first line of each test case contains two space-separated integers **N** and **K** respectively.
- The second line of each test case contains **N** space separated integers, $A_1, A_2, ..., A_N$.

## Output

For each testcase, print a single line containing two space separated integers **L** and **R** respectively.

## Constraints

- $1 ≤ T ≤ 10^3$

- **Week 1: Programming Assignment 1 (/noc21_cs99/progassignment?name=64)**
- Week 1: Programming Assignment 2 (/noc21_cs99/progassignment?name=65)
- Week 1 Feedback Form: Getting Started with Competitive Programming (unit?unit=27&lesson=38)

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- $1 \le N \le 10^5$
- $1 \le K \le 10^9$
- $0 \le A_i \le 1.1*10^{17}$, for all possible values of i.
- It is guaranteed that $A_i*K$ doesn't exceed $1.1*10^{17}$
- It is guaranteed that $0 \le S \le 1.1*10^{12}$
- Sum of **N** over all test cases doesn't exceed $5*10^5$

# Example Input

```
4
5 10
2 4 6 9 11
5 100
0 0 0 0 1
3 1
111111111111 222222222222 333333333333
2 100
10000000000 20000000000
```

# Example Output

```
23 23
20 24
111111111111 111111111111
1000000000000 1000000000049
```

# Explanation

**Example case 1:**
Only keeping **S=23** satisfies $A_i = \lfloor (i*S)/K \rfloor$.
**S=23** makes **i*S** = **(23**, **46**, **69**, **92** , **115)** which makes $\lfloor (i*S)/K \rfloor$ = **(2** , **4** , **6** , **9** , **11)**.
**S=22** is not correct answer as its makes **i*S** = **(22**, **44**, **66**, **88**, **110)**, which would make $\lfloor (i*S)/K \rfloor$ = **(2** , **4** , **6** , **8** , **11)** which doesn't match with given array **A**.

**Example case 2:**
Only keeping **S=20, S=21, S=22, S=23,** and **S=24** satisfies given array **A**.

**Your last recorded submission was on 2021-08-01, 01:02 IST**
Select the Language for this assignment. Java

File name for this program : Main.java

```
85
86
87      /************************ SOLUTION ENDS HERE **************
88
89
90      /************************ TEMPLATE STARTS HERE ************
91
92      public static void main(String[] args) throws IOException {
93          FastScanner in = new FastScanner(System.in);
94          PrintWriter out =
95                  new PrintWriter(new BufferedWriter(new OutputStr
96          solve(in, out);
97          in.close();
```

```
 98         out.close();
 99     }
100
101     static class FastScanner {
102         BufferedReader reader;
103         StringTokenizer st;
104
105         FastScanner(InputStream stream) {
106             reader = new BufferedReader(new InputStreamReader(st
107             st = null;
108         }
```

You may submit any number of times before the due date. The final submission will be considered for grading.

**This assignment has Public Test cases. Please click on "Compile & Run" button to see the status of Public test cases. Assignment will be evaluated only after submitting using Submit button below. If you only save as or compile and run the Program , your assignment will not be graded and you will not see your score after the deadline.**

| Save as Draft | Compile & Run | Submit | Reset |
|---|---|---|---|

## Sample Test Cases

| | Input | Output |
|---|---|---|
| Test Case 1 | 4<br>5 10<br>2 4 6 9 11<br>5 100<br>0 0 0 0 1<br>3 1<br>111111111111 222222222222<br>333333333333<br>2 100<br>10000000000 20000000000 | 23 23<br>20 24<br>111111111111<br>111111111111<br>1000000000000<br>1000000000049 |