

B. Strange Machine

time limit per test: 1.5 seconds

memory limit per test: 256 megabytes

You are given n machines arranged in a circle, where n is at most 20. Each machine is either of type A or type B. The machines are numbered clockwise from 1 to n , and the type of the i -th machine is denoted by s_i . Each machine takes an integer x and updates it according to its type:

- Type A: Decrease x by 1. Formally, update $x := x - 1$.
- Type B: Replace x with the floor of half its value. Formally, update $x := \lfloor \frac{x}{2} \rfloor$, where $\lfloor y \rfloor$ denotes the floor of y , which is the greatest integer less than or equal to y .

You are given q queries, each consisting of a single integer a . In each query, you start at machine 1 holding an integer a . Each second, the following two actions occur in order:

1. The current machine updates a according to its type.
2. Then, move one step clockwise to the next machine. Formally

- If you are at machine i where $1 \leq i \leq n - 1$, move to machine $i + 1$.
- If you are at machine n , move to machine 1.

This process continues until your integer a becomes 0. For each query, determine the number of seconds required for a to reach 0.

Note that all queries are independent of each other.

DeepL 翻译



你有 n 台机器，它们围成一个圆圈，其中 n 最多为 20。机器的顺时针编号从 1 到 n ，第 i 台机器的类型用 s_i 表示。每台机器获取一个整数 x 并根据其类型进行更新：

- 类型 A：用 1 减少 x 。形式上，更新 $x := x - 1$ 。
- 类型 B：将 x 替换为其值一半的下限。正式更新 $x := \lfloor \frac{x}{2} \rfloor$ ，其中 $\lfloor y \rfloor$ 表示 y 的 floor，是小于等于 y 的最大整数。

给你提供了 q 个查询，每个查询都包含一个整数 a 。在每个查询中，你都从持有整数 a 的机器 1 开始。每秒钟，以下两个操作依次进行：

1. 当前机器根据其类型更新 a 。
2. 然后，顺时针移动一步到下一台机器。形式为

- 如果您在机器 i where $1 \leq i \leq n - 1$ 处，则移动到机器 $i + 1$ 。
- 如果您在机器 n 处，则移动到机器 1。

这个过程一直持续到整数 a 变为 0。对于每次查询，请计算 a 到达 0 所需的秒数。

请注意，所有查询都是相互独立的。

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.

Codeforces Round 1061 (Div. 2)

比赛进行中

01:47:07

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	482
Problem B	723
Problem C	1446
Problem D	1928
Problem E	2651
Problem F1	3133
Problem F2	3133
Successful hack	100
Unsuccessful hack	-50
Unsuccessful submission	-50
Resubmission	-50

* If you solve problem on 00:09 from the first attempt

The first line of each test case contains two integers n and q ($1 \leq n \leq 20, 1 \leq q \leq 10^4$) — the number of machines, and the number of queries, respectively.

The second line of each test case contains a string s ($|s| = n$ and $s_i = \text{A or B}$) — the types of the machines.

The third line of each test case contains q integers a_1, a_2, \dots, a_q ($1 \leq a_i \leq 10^9$) — the initial integer of each query.

Note that there are no constraints on the sum of n over all test cases.

It is guaranteed that the sum of q over all test cases does not exceed 10^4 .

DeepL 翻译

输入

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 ($1 \leq t \leq 10^4$)。测试用例说明如下。

每个测试用例的第一行分别包含两个整数 n 和 q ($1 \leq n \leq 20, 1 \leq q \leq 10^4$) -- 机器数量和查询次数。

每个测试用例的第二行包含一个字符串 s ($|s| = n$ 和 $s_i = \text{A or B}$) -- 机器类型。

每个测试用例的第三行包含 q 个整数 a_1, a_2, \dots, a_q ($1 \leq a_i \leq 10^9$) - 每个查询的初始整数。

请注意，所有测试用例中的 n 之和不受限制。

保证所有测试用例中 q 的总和不超过 10^4 。



Output

For each test case, output q integers representing the answers to each query.

DeepL 翻译

输出

对于每个测试用例，输出 q 个整数，代表每个查询的答案。



Example

input

```
3
2 2
BA
3 4
1 1
B
20
6 4
BAABBA
2 8 32 95
```

output

```
2
3
5
2
5
8
11
```



Note

In the first test case, the queries are as follows:

- Query 1: $a = 3$
 1. Start at machine 1. Machine 1 replaces a with the floor of half its value. Now, $a = \lfloor \frac{3}{2} \rfloor = 1$.
 2. Move to machine 2. Machine 2 decreases a by 1. Now, $a = 1 - 1 = 0$.

Therefore, it takes 2 seconds for a to reach 0.

- Query 2: $a = 4$

1. Start at machine 1. Machine 1 replaces a with the floor of half its value. Now, $a = \lfloor \frac{4}{2} \rfloor = 2$.
2. Move to machine 2. Machine 2 decreases a by 1. Now, $a = 2 - 1 = 1$.
3. Move back to machine 1. Machine 1 replaces a with the floor of half its value. Now, $a = \lfloor \frac{1}{2} \rfloor = 0$.

Therefore, it takes 3 seconds for a to reach 0.

In the second test case, there is only one query with $a = 20$:

1. Start at machine 1. Machine 1 replaces a with the floor of half its value. Now, $a = \lfloor \frac{20}{2} \rfloor = 10$.
2. Move to machine 1. Machine 1 replaces a with the floor of half its value. Now, $a = \lfloor \frac{10}{2} \rfloor = 5$.
3. Move to machine 1. Machine 1 replaces a with the floor of half its value. Now, $a = \lfloor \frac{5}{2} \rfloor = 2$.
4. Move to machine 1. Machine 1 replaces a with the floor of half its value. Now, $a = \lfloor \frac{2}{2} \rfloor = 1$.
5. Move to machine 1. Machine 1 replaces a with the floor of half its value. Now, $a = \lfloor \frac{1}{2} \rfloor = 0$.

Therefore, it takes 5 seconds for a to reach 0.

DeepL 翻译

注

在第一个测试案例中，查询如下：

- 查询 1 : $a = 3$
 - 从机器 1 开始。机器 1 将 a 替换为其值一半的下限。现在， $a = \lfloor \frac{3}{2} \rfloor = 1$ 。
 - 移动到机器 2。机器 2 将 a 减少 1。现在是 $a = 1 - 1 = 0$ 。

因此， a 到达 0 需要 2 秒。
- 查询 2 : $a = 4$
 - 从机器 1 开始。机器 1 将 a 替换为其值一半的下限。现在， $a = \lfloor \frac{4}{2} \rfloor = 2$ 。
 - 移动到机器 2。机器 2 将 a 减少 1。现在是 $a = 2 - 1 = 1$ 。
 - 移回机器 1。机器 1 将 a 替换为其数值一半的下限。现在是 $a = \lfloor \frac{1}{2} \rfloor = 0$ 。

因此， a 到达 0 需要 3 秒。

在第二个测试用例中，只有一个 $a = 20$ 的查询：

1. 从机器 1 开始。机器 1 将 a 替换为其值一半的下限。现在， $a = \lfloor \frac{20}{2} \rfloor = 10$ 。
2. 移动到机器 1。机器 1 以 a 值的一半的下限代替 a 值。现在是 $a = \lfloor \frac{10}{2} \rfloor = 5$ 。
3. 移动到机器 1。机器 1 将 a 替换为其数值一半的下限。现在是 $a = \lfloor \frac{5}{2} \rfloor = 2$ 。
4. 移动到机器 1。机器 1 将 a 替换为其数值一半的下限。现在是 $a = \lfloor \frac{2}{2} \rfloor = 1$ 。
5. 移动到机器 1。机器 1 以 a 值的一半的下限代替 a 。现在是 $a = \lfloor \frac{1}{2} \rfloor = 0$ 。

因此， a 到达 0 需要 5 秒。

GNU G++17 7.3.0

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▶ 自定义测试数据(自动保存)



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