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Pass through the doors

Problem Code: **OPENDOOR**

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You are given a sequence of N tollbooths on the highway, and your objective is to reach your destination by passing through all of them. The tollbooths in the given sequence can be of T different types, and there exist T separate types of tickets corresponding to each. You are allowed to pass through a tollbooth of type $j \in \{1, 2, \dots, T\}$ only if you can show a ticket of type j to the person at the counter. Let A_j denote the amount of money required to buy a ticket of type j . But tickets are always sold in pairs - whenever you buy a ticket of type j by paying the amount A_j , then you are always given another free ticket of the same type. You initially start your journey with no tickets. As you make your way through the sequence of tollbooths and buy tickets along the way, you always put the last ticket bought on the top of the pile of existing tickets in your backpack. Whenever you encounter a new tollbooth, you only have time to check the top K tickets from the pile in your backpack before people behind you start abusing you for holding up the queue for too long. So, among the top K tickets in your pile, if you do have a valid ticket for passing through the newly encountered tollbooth, then you can use that ticket, and it will be removed from your backpack without affecting the relative ordering of the rest of the pile. Your task is to keep track of the minimum amount of money that will be necessary for you to reach your destination, and also the number of extra tickets that will remain in your backpack after passing through all the tollbooths by paying the minimum amount.

My Submissions

(/B03G2020/status/OPENDOOR)

All Submissions

(/B03G2020/status/OPENDOOR)

Successful Submissions

Input

First line of input contains three integers - N , T and K . The next T lines contain one character and one integer each, which represent a type of tollbooth j and the amount of money A_j that required to buy a ticket of type j . The final line contains N characters separated by a space each, where the i -th character denotes the type of the i -th tollbooth encountered.

Output

A single line containing two space separated integers, which represent the minimum amount of money required and the number of extra tickets remaining respectively.

Constraints

$$1 \leq N \leq 10^5$$

$$1 \leq T \leq 26$$

$$1 \leq K \leq 10^4$$

$$1 \leq A_j \leq 100$$

Sample input

```
5 3 2
A 5
B 10
C 15
A B A C C
```

Sample output

```
30 1
```

Note

The minimum amount of money required to pass through the tollbooths might not fit in integer datatype, and may require long.

Explanation

At first tollbooth of type A you will pay 5 units of money, as you don't have any existing tickets, and receive two tickets of type A. One of these tickets will be used immediately for passing through the first tollbooth, and the other one will be added to the pile in your backpack. Proceeding onwards, the amount paid at the 2nd and 4th tollbooths will be 10 and 15 respectively, whereas tickets from the existing pile can be used at the 3rd and 5th tollbooths. So, the total amount to be paid will be 30, and you will have 1 ticket of type B remaining.

Author: [dsaadmin \(/users/dsaadmin/\)](/users/dsaadmin/)

Tags: [dsaadmin \(/tags/problems/dsaadmin/\)](/tags/problems/dsaadmin/)

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Time Limit: 0.5 secs

Source Limit: 50000 Bytes

Languages: C, CPP14, JAVA, PYTH, PYTH 3.6

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CodeChef was created as a platform to help programmers make it big in the world of **algorithms**, **computer programming**, and **programming contests**. At CodeChef we work hard to revive the geek in you by hosting a **programming contest** at the start of the month and two smaller programming challenges at the middle and end of the month. We also aim to have training sessions and discussions related to **algorithms**, **binary search**, technicalities like **array size** and the likes. Apart from providing a platform for **programming competitions**, CodeChef also has various algorithm tutorials and forum discussions to help those who are new to the world of **computer programming**.

Practice Section (/problems/easy/) - A Place to hone your 'Computer Programming Skills'

Try your hand at one of our many practice problems and submit your solution in the language of your choice. Our **programming contest** judge accepts solutions in over 55+ programming languages. Preparing for coding contests were never this much fun! Receive points, and move up through the CodeChef ranks. Use our practice section to better prepare yourself for the multiple **programming challenges** that take place through-out the month on CodeChef.

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[Online Hosting \(/news/yourcontest\)](/news/yourcontest)

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[Hard \(/problems/Hard/\)](/problems/Hard/)

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