Description:

Suppose there is a country named X. There are a lot of islands in that country. There is a person named Tauseef, the richest guy in that country. Recently, he bought some islands. Among these islands, some are big, and some are small. So, he thought of making n resorts on those islands. He could make only one resort on each small island but could make more than one resort on the big islands. He thought of naming and numbering those resorts.

Since Tauseef thought of making **n** resorts, he assigned each resort a name and number, **v (1 <= v <= n)**. He thought of a wired naming system for the resorts!! If it's a big island, then the names of each resort must not be less than the length of k. Each resort's name on big islands is a substring of at least one of the other resort's names on that island. For example, suppose there are **j** resorts on an island and **i'th** resort has a name, **Si** - a string containing small letters. For each resort on that island, one of the following conditions hold –

- **Si** is a substring of at least one of the strings for all **i (1 <= i <= j)**
- There is at least one string for all **i (1 <= i <= j)** which is a substring of **Si**

Here **j (j > 1)** is the number of names of resorts on an island.

After naming those islands he thought of connecting those islands with roads. Tauseef, the richest guy in the country thought that each of his islands should be connected with other islands by at least one road. But there were already some prebuilt roads (There wasn't more than one prebuilt road between the two islands). Now he wants to know the minimum number of roads that should be built so that all his islands are connected. So, he asked for your help! You have to calculate the minimum number of roads to be built.

Input:

The first line contains 3 integers n, k and x – the number of resorts, the minimum length of the resort (islands that contain more than one resort) name and the number of prebuilt roads.

A string s and an integer m – the name of the resort and the assigned number of that resort.

Output:

A single integer: the number of roads to be built.

Test Case 1:

Input	Output
10 3 2	13

abca 3 abc 1 bca 5 xyzaa 6 x 10 yza 2 aaaaa 4 uba 7 oleo 8 ole 9	

Test Case 2:

Input	Output
13 2 8 abcd 1 cd 3 ab 2 xyz 10 yzcd 5 asdf 6 sd 8 ghjk 7 hj 4 poiu 9 iu 2 vbnm 11 vbn 13	7

Test Case 3:

Input	Output
20 5 4 ghfjghu 1 jsfs 2 jdsfs 3 mmocmco 11 sdkfishduhf 5 djfeqqaa 6 asfcfs 20 dfkgg 9 tyririreoo 12 mnvcbcmnbc 13 lplojrwyaav 14 fhgneor 15 dgskdghs 18 alloawtwerrwrwr 17 dsjfhs 4 ababsssbbbbbb 7 edfkjeiofuev 8	186

lorooportpe 10 uqequgeq 19 skfgeuf 16	

Test Case 4:

Input	Output
7 2 0 aac 1 gjhh 2 kgr 3 fhfg 5 fhfg 7 aacf 4 kgr 6	6

Test Case 5:

Input	Output
7 2 54 aac 1 gjhh 2 kgr 3 fhfg 5 fhfg 7 aacf 4 kgr 6	0