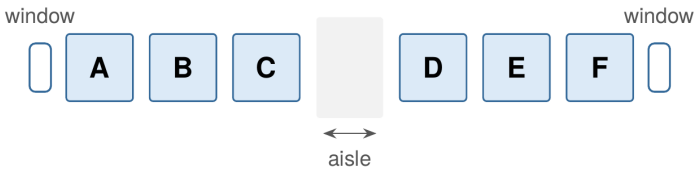
Problem L
Can't Let You Through

Boarding is about to begin! An aeroplane has N rows, numbered from 1 to N. Each row has six seats arranged as follows:



Seats A and F are window seats, while seats C and D are aisle seats.

There are M passengers waiting in a single boarding queue. They are initially numbered from 1 to M from front to back. Passenger j is assigned to seat S_j in row R_j. The flight is not necessarily full, and every passenger is assigned a unique seat. Passengers board one by one in the order of the queue.

When a passenger reaches their row, they move from the aisle towards their assigned seat. Any passenger already seated between the aisle and the arriving passenger's assigned seat must stand up to let them pass. Each time a seated passenger has to stand up, they contribute 1 unit of inconvenience. After the arriving passenger takes their seat, all passengers who stood up sit down again.

For example, in one row, if both seats D and E are already occupied when the passenger assigned to seat F arrives, both seated passengers must stand up, contributing 2 units of inconvenience.

Before boarding begins, the crew may perform at most K **call-forward operations**. In one call-forward operation, the crew chooses one passenger, removes them from their current position in the queue, and inserts them at **any** earlier position. The relative order of all other passengers remains unchanged.

Find the minimum possible total inconvenience.

Input

The first line contains three space-separated integers N, M, and K ($1 \le N \le 100\,000$, $1 \le M \le 6N$, $0 \le K \le M$), denoting the number of rows, the number of passengers, and the number of call-forward operations the crew can perform.

Each of the next M lines contains an integer R_j and a character S_j separated by a space ($1 \le R_j \le N$, $S_j \in \{\texttt{A}, \texttt{B}, \texttt{C}, \texttt{D}, \texttt{E}, \texttt{F}\}$), describing the seat assigned to passenger j. No two passengers are assigned to the same seat.

Output

Output a single integer denoting the minimum possible total inconvenience after the crew performs at most K call-forward operations.

Sample 1

Sample Input	Sample Output
2 5 0 1 C 2 E 1 B 1 A 2 B	3

Explanation of Sample 1: No call-forward operations can be performed. The passengers will board the aeroplane as follows.

- Passenger 1 heads to seat 1C.
- Passenger 2 heads to seat 2E.
- Passenger 3 heads to seat 1B. The passenger already sitting in seat 1C must stand up, contributing 1 unit of inconvenience.
- Passenger 4 heads to seat 1A. The passengers already sitting in seats 1C and 1B must stand up, contributing 2 units of inconvenience.
- Passenger 5 heads to seat 2B. The passenger already sitting in seat 2E does not need to stand up as they are not between the aisle and seat 2B.

Therefore, the total inconvenience is 3.

Sample 2

Sample Input	Sample Output
2 6 1 1 C 2 A 1 B 1 A 2 C 2 B	2

Explanation of Sample 2: If no call-forward operations are performed, the total inconvenience is 4.

The crew can move passenger 4, who is assigned to seat 1A, to the front of the queue. Thus, the passengers who are assigned seats 1A, 1C, 2A, 1B, 2C, and 2B will board the aeroplane in that order.

Therefore, the total inconvenience is 2. It can be shown that this is the minimum possible total inconvenience.

Sample 3

Sample Input	Sample Output
3 7 2 1 D 1 E 1 F 2 B 2 A 3 F 3 D	1

Explanation of Sample 3: The crew can first move passenger 3, who is assigned to seat 1F, to the front of the queue. They can then move passenger 2, who is assigned to seat 1E, to the front of passenger 1, who is assigned to seat 1D. The first three passengers in the resulting queue are assigned to seats 1F, 1E, and 1D, in that order, causing no inconvenience.

The only inconvenience occurs when the passenger assigned to seat 2A arrives, and the passenger already seated in seat 2B must stand up. Thus, the total inconvenience is 1. It can be shown that this is the minimum possible.

Sample 4

Sample Input	Sample Output
23 2 2 23 F 23 B	0

Explanation of Sample 4: The crew does not need to perform any call-forward operations because the original boarding order already results in 0 total inconvenience.

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