Flower's land 3

Input file: `standard input`
Output file: `standard output`
Time limit: 1 second
Memory limit: 1024 megabytes

There is a binary string s_1 of length m stored on disk #1.

Then, there are $n-1$ operations. In the i-th operation, a disk $1 \le p_{i+1} \le i$ is chosen, and the string $s_{p_{i+1}}$ on that disk is copied to disk $i+1$, producing s_{i+1}. However, during the copying process, up to k bits may be flipped (i.e., errors occur in at most k positions).

You are given all the final n binary strings $s_1, s_2, \ldots, s_n$, each of length m. Your task is to determine how many possible sequences $p_2, p_3, \ldots, p_n$ could result in this final configuration.

Since the answer can be large, you only need to find the answer modulo 998244353.

Input

The first line of the input contains three integers n, m, k ($2 \le n \le 5000, 4 \le m \le 15000, 1 \le k \le 3$), described in the statement. It is guaranteed that m is a multiple of 4.

Each of the next n lines contains a hexadecimal string s'_i of length $m/4$. Each character of s'_i is one of `0-9` or `A-F`, where `A` $= 10$, `B` $= 11$, …, `F` $= 15$.

Each bit in the hexadecimal representation s'_i corresponds to four consecutive bits in the binary string s_i. Specifically, for each bit $s'_{i,j}$, it can be proved that there exists a unique tuple (a, b, c, d) satisfying $s'_{i,j} = 8a + 4b + 2c + d$ and $a, b, c, d \in \{0, 1\}$. Bits in the binary string s_i satisfy $(s_{i,4j}, s_{i,4j+1}, s_{i,4j+2}, s_{i,4j+3}) = (a, b, c, d)$.

Output

Print an integer — the number of valid sequences $(p_2, p_3, \ldots, p_n)$ modulo 998244353.

Example

standard input	standard output
5 8 2 95 05 BD 9C BD	6