



Vim War

by viv001

Problem

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A war has broken down between Vim and Emacs. Gedit, being Vim's ally, is captured by Emacs as a prisoner of war and it is up to Vim to rescue him by defeating Emacs.

For this task, Vim has to assemble an army of appropriate skills. He can choose a **non-empty** subset of soldiers from a set of N soldiers (numbered from 1 to N). Each soldier has some subset of skills out of M different skills (numbered from 1 to M). The skill-set of an army is the union of skill-sets of its constituent soldiers. To win the war, Vim needs to know how many different subsets of soldiers satisfy his skill-set requirement. Since the answer can be huge, print it modulo $10^9 + 7$.

Note : The chosen army's skill-set must **exactly** match the skill-set requirement of Vim (i.e no extra skills must be present in the army's skill-set than what is required).

Input Format

The first line contains N and M , the number of soldiers to choose from and the number of different skills possible respectively.

The next N lines contain M boolean characters each. If the j^{th} character of the i^{th} line is 1 , then the i^{th} soldier possess the j^{th} skill and if it is 0 , then not.

The last line contains M boolean characters denoting the requirement skill-set of Vim where the j^{th} character being 1 signifies that Vim wants the j^{th} skill to be present in his final army and not, otherwise.

Constraints

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

$$1 \leq M \leq 20$$

Output Format

Output in a single line the required answer, as explained above.

Sample Input

```
4 2
00
10
01
11
11
```

Sample Output

```
10
```

Explanation

Vim wants both the skills to be present in his selected army. Hence, he can choose the following subsets of soldiers:

- 1, 2, 3, 4
- 1, 2, 4

3. 1, 3, 4

4. 2, 3, 4

5. 1, 4

6. 2, 4

7. 3, 4

8. 4

9. 1, 2, 3

10. 2, 3



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Max Score: 120

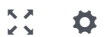
Difficulty: Advanced

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Java 7



```
1 import java.io.*;
2 import java.util.*;
3 import java.text.*;
4 import java.math.*;
5 import java.util.regex.*;
6
7 public class Solution {
8
9     public static void main(String[] args) {
10         /* Enter your code here. Read input from STDIN. Print output to STDOUT. Your class should be named Solution. */
11     }
12 }
```

Line: 1 Col: 1

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