

Data Structures Assignment-3

B) Vineeth and his love for Food

Vineeth is a regular customer of Van Lavino. He has already eaten N dishes (he may eat same dish more than once). There are K distinct ingredients used in that restaurant. Each dish is made using a subset of these ingredients. The closeness value of any two dishes X and Y is defined as the number of ingredients which are either used in both the dishes or not used in any of them.

Hatred value of a dish is defined as maximum closeness value with any of the previous N dishes. Vineeth wants to try a dish with minimum hatred value.

Input

First line contains two integers N and K . Each of the next N lines contains a binary string of length K . 1 in position j in string of i^{th} dish means that j^{th} ingredient is present in i^{th} dish and a 0 means it doesn't have j^{th} ingredient.

Output

Output the minimum possible hatred value.

Constraints

$1 \leq N \leq 300000$, number of dishes

$1 \leq K \leq 20$, number of ingredients

Sample Input 1

```
1 3
001
```

Sample Output 1

```
0
```

Sample Explanation 1

Take its inverted string, 110. Hatred value of this dish is 0.

Sample Input 2

```
3 3
001
100
010
```

Sample Output 2

```
1
```

Sample Explanation 2

Consider the string 111, its hatred value will be 1. For all other binary strings of length 3, except 111 , we can't get a hatred value less than 1.

Limits

Time: 4 second

Memory: 256 MB