

Contest Duration: 2018-05-20(Sun) 20:00 (<http://www.timeanddate.com/worldclock/fixedtime.html?iso=20180520T2100&p1=248>) ~ 2018-05-20(Sun) 22:10 (<http://www.timeanddate.com/worldclock/fixedtime.html?iso=20180520T2310&p1=248>) (local time) (130 minutes)

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## F - Simple Subsequence Problem

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Time Limit: 2 sec / Memory Limit: 1024 MB

Score : 2300 points

### Problem Statement

You are given a set  $S$  of strings consisting of '0' and '1', and an integer  $K$ .

Find the longest string that is a subsequence of  $K$  or more different strings in  $S$ . If there are multiple strings that satisfy this condition, find the lexicographically smallest such string.

Here,  $S$  is given in the format below:

- The data directly given to you is an integer  $N$ , and  $N + 1$  strings  $X_0, X_1, \dots, X_N$ . For every  $i$  ( $0 \leq i \leq N$ ), the length of  $X_i$  is  $2^i$ .
- For every pair of two integers  $(i, j)$  ( $0 \leq i \leq N, 0 \leq j \leq 2^i - 1$ ), the  $j$ -th character of  $X_i$  is '1' if and only if the binary representation of  $j$  with  $i$  digits (possibly with leading zeros) belongs to  $S$ . Here, the first and last characters in  $X_i$  are called the 0-th and  $(2^i - 1)$ -th characters, respectively.
- $S$  does not contain a string with length  $N + 1$  or more.

Here, a string  $A$  is a subsequence of another string  $B$  when there exists a sequence of integers  $t_1 < \dots < t_{|A|}$  such that, for every  $i$  ( $1 \leq i \leq |A|$ ), the  $i$ -th character of  $A$  and the  $t_i$ -th character of  $B$  is equal.

### Constraints

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- $0 \leq N \leq 20$
- $X_i (0 \leq i \leq N)$  is a string of length  $2^i$  consisting of '0' and '1'.
- $1 \leq K \leq |S|$
- $K$  is an integer.

## Input

Input is given from Standard Input in the following format:

```
N K
X0
:
XN
```

## Output

Print the lexicographically smallest string among the longest strings that are subsequences of  $K$  or more different strings in  $S$ .

### Sample Input 1

Copy

```
3 4
1
01
1011
01001110
```

Copy

### Sample Output 1

Copy

```
10
```

Copy

The following strings belong to  $S$ : the empty string, '1', '00', '10', '11', '001', '100', '101' and '110'. The lexicographically smallest string among the longest strings that are subsequences of four or more of them is '10'.

### Sample Input 2

Copy

Copy

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```
4 6
1
01
1011
10111010
1101110011111101
```

## Sample Output 2

[Copy](#)

```
100
```

[Copy](#)

## Sample Input 3

[Copy](#)

```
2 5
0
11
1111
```

[Copy](#)

## Sample Output 3

[Copy](#)[Copy](#)

The answer is the empty string.

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