Problem E. Card Shark

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

There are n decks of cards on the table, the i-th deck consists of a_i cards and the j-th card from top to bottom is $s_{i,j}$. To simplify this problem we only consider cards to be high and low. If the card is a high card then $s_{i,j} = 1$. If it is a low one then $s_{i,j} = 0$.

There are m gamblers sitting around the table waiting for a card game. You are the dealer of the game and your task is to stack all decks of cards into one big pile. You can only control the order between decks. Neither can you insert or remove a card nor can you change the order of cards within a deck.

After the pile is made the cards will be dealt to the gamblers. The i-th gambler will be given the i-th, $(m + i)$-th, $(2m + i)$-th, ..., $(km + i)$-th, ... card from top to bottom. What the other gamblers do not know is that the b-th gambler is actually your boss. To ensure the victory, all cards given to your boss must be high cards and all cards given to the other gamblers must be low cards.

Find an order to stack the decks to fulfill this requirement or report that this is impossible. If a valid answer exists, report the answer with the smallest lexicographical order.

The answer, if it exists, is obviously a permutation of n. We say permutation $P = p_1, p_2, \cdots, p_n$ is lexicographically smaller than permutation $Q = q_1, q_2, \cdots, q_n$ if there exists an integer t such that $p_i = q_i$ for all $1 \le i < t$ and $p_t < q_t$.

Input

There is only one test case in each test file.

The first line of the input contains three integers n, m and b ($1 \le n \le 2 \times 10^5$, $2 \le m \le 2 \times 10^5$, $1 \le b \le m$) indicating the number of decks, the number of gamblers and the boss.

For the following n lines, the i-th line contains a string $s_{i,1}s_{i,2}\cdots s_{i,a_i}$ ($s_{i,j} \in \{0, 1\}$, $1 \le a_i \le 10^6$) indicating the i-th deck.

It's guaranteed that

- There is at least one high card in each deck.
- The total number of cards is divisible by m.
- The total number of cards does not exceed 10^6.

Output

If a valid answer exists, output n integers $d_1, d_2, \cdots, d_n$ separated by a space indicating the answer with the smallest lexicographical order, where d_i is the index of the i-th deck in the pile from top to bottom.

If no vaild answer exists, simply output "-1" (without quotes).

Examples

standard input	standard output
5 4 3 0100010 00100 001000100 0010 0100010	2 1 3 5 4
4 2 1 010 10101 010 10101	2 1 4 3
1 5 3 001000010000100	1
2 5 3 01000 00010	-1
1 5 3 11111	-1