A - Binary Sudoku

Mark likes to play an interesting variant of the popular game of "Sudoku". His version involves a 9 x 9 grid of 3 x 3 subgrids, just like regular Sudoku. His version, however, uses only binary digits:

```
000 000 000
001 000 100
000 000 000

000 110 000
000 111 000
000 000 000

000 000 000
000 000 000
000 000 000
```

The goal of binary Sudoku is to toggle as few bits as possible so that each of the nine rows, each of the nine columns, and each of the nine 3 x 3 subgrids has even parity (i.e., contains an even number of 1s). For the example above, a set of 3 toggles gives a valid solution:

```
000 000 000
001 000 100
001 000 100

000 110 000
000 110 000
000 000 000

000 000 000
000 000 000
000 000 000
```

Given the initial state of a binary Sudoku board, please help Mark determine the minimum number of toggles required to solve it.

INPUT FORMAT:

* Lines 1..9: Each line contains a 9-digit binary string corresponding
  to one row of the initial game board.

SAMPLE INPUT:

```
000000000
001000100
000000000
000110000
000111000
000000000
000000000
000000000
000000000
```

INPUT DETAILS:

The Sudoku board in the sample input is the same as in the problem text above.

OUTPUT FORMAT:

* Line 1: The minimum number of toggles required to make every row,
  column, and subgrid have even parity.

SAMPLE OUTPUT:

3

OUTPUT DETAILS:

Three toggles suffice to solve the puzzle.

B - Tile Exchanging

Mark wants to remodel the floor of his office using a collection of
square tiles he recently purchased from the local square mart store (which
of course, only sells square objects). Unfortunately, he didn't measure
the size of the barn properly before making his purchase, so now he needs
to exchange some of his tiles for new square tiles of different sizes.

The N square tiles previously purchased by Mark have side lengths A_1...A_N.
He would like to exchange some of these with new square tiles so that the
total sum of the areas of the his tiles is exactly M. Square mart is
currently offering a special deal: a tile of side length A_i can be
exchanged for a new tile of side length B_i (B_i > 0) for a cost of
|A_i-B_i|*|A_i-B_i| units. However, this deal only applies to
previously-purchased tiles -- Mark is not allowed to exchange a tile that he
has already obtained via exchanging some other tile (i.e., a size-3 tile
cannot be exchanged for a size-2 tile, which is then exchanged for a size-1
tile).

Please determine the minimum amount of money required to exchange tiles so
that the sum of the areas of the tiles becomes M. Output -1 if it is
impossible to obtain an area of M.

INPUT FORMAT:

* Line 1: Two space-separated integers, N (1<=N<=10) and M
  (1<=M<=10,000).

* Lines 2..1+N: Each line contains one of the integers A_1 through
  A_N, describing the side length of an input square
  (1<=A_i<=100).

SAMPLE INPUT:

```
3 6
3
3
1
```

INPUT DETAILS:

There are 3 tiles. Two are squares of side length 3, and one is a square
with side length 1. We would like to exchange these to make a total area of 6.

OUTPUT FORMAT:

* Line 1: The minimum cost of exchanging tiles to obtain M units of
  total area, or -1 if this is impossible.

SAMPLE OUTPUT:

```
5
```

OUTPUT DETAILS:

Exchange one of the side-3 squares for a side-2 square, and another side-3 square for a side-1 square. This gives the desired area of 4+1+1=6 and costs 4+1=5 units.

C - Clear And Present Danger

Mark is on a boat seeking fabled treasure on one of the N (1 <= N <= 100) islands conveniently labeled 1..N in the Caribbean Sea.

The treasure map tells him that he must travel through a certain sequence A_1, A_2, ..., A_M of M (2 <= M <= 10,000) islands, starting on island 1 and ending on island N before the treasure will appear to him. He can visit these and other islands out of order and even more than once, but his trip must include the A_i sequence in the order specified by the map.

Mark wants to avoid pirates and knows the pirate-danger rating (0 <= danger <= 100,000) between each pair of islands. The total danger rating of his mission is the sum of the danger ratings of all the paths he traverses.

Help Mark find the least dangerous route to the treasure that satisfies the treasure map's requirement.

INPUT FORMAT:

* Line 1: Two space-separated integers: N and M

* Lines 2..M+1: Line i+1 describes the i_th island Mark must visit with a single integer: A_i

* Lines M+2..N+M+1: Line i+M+1 contains N space-separated integers that are the respective danger rating of the path between island i and islands 1, 2, ..., and N, respectively. The ith integer is always zero.

SAMPLE INPUT:

```
3 4
1
2
1
3
0 5 1
5 0 2
1 2 0
```

INPUT DETAILS:

There are 3 islands and the treasure map requires Mark to visit a sequence of 4 islands in order: island 1, island 2, island 1 again, and finally island 3. The danger ratings of the paths are given: the paths (1, 2); (2, 3); (3, 1) and the reverse paths have danger ratings of 5, 2, and 1, respectively.

OUTPUT FORMAT:

* Line 1: The minimum danger that Mark can encounter while

obtaining the treasure.

SAMPLE OUTPUT:

7

OUTPUT DETAILS:

He can get the treasure with a total danger of 7 by traveling in the sequence of islands 1, 3, 2, 3, 1, and 3. The map's requirement (1, 2, 1, and 3) is satisfied by this route. We avoid the path between islands 1 and 2 because it has a large danger rating.