

Problem A

Carnival Games

Input File: *testdata.in*

Time Limit: 2 seconds

Problem Description

Consider an $n \times m$ array A of nonnegative integers, $A_{i,j}$ where $0 \leq i \leq n - 1$ and $0 \leq j \leq m - 1$, rolled into a cylinder, so that the top and bottom rows are glued together.

A path is to be threaded from the entry side (column 1 of A) of the cylinder to the exit side (column m of A), subject to the restriction that from the given square (i, j) it is possible to move to $(i + 1, j + 1)$, $(i, j + 1)$ or $(i - 1, j + 1)$. The path may begin at any position on the entry side and end at any position on the exit side. The cost of such a path is the sum of the integers in the squares through which it passes. Note that only squares with a positive integer can be passed through in the path, a square with 0 denotes a forbidden location. You should figure out the minimum cost path.

Technical Specifications

1. The number of rows n would satisfy $2 \leq n \leq 99$.
2. The number of columns m would satisfy $2 \leq m \leq 99$.
3. Each $A_{i,j}$ would satisfy $0 \leq A_{i,j} \leq 999$.

Input Format

The first line of the input file contains an integer indicating the number of test cases to follow. Each test case contains two integers n and m , separated by spaces. It starts at the next line, all rows are listed line by line, and all integer of squares in a row separated by spaces.

Output Format

For each test case, output the minimum cost. The cost is -1 if it can not find the path.

Sample Input

```
2
3 4
5 0 2 8
4 9 0 1
7 3 6 0
6 6
1 2 0 4 5 6
1 2 0 0 5 0
0 2 3 0 5 6
1 0 3 0 5 6
1 2 0 0 5 6
1 2 0 4 5 6
```

Sample Output

```
10
-1
```