E. The Lakes

time limit per test: 3 seconds
memory limit per test: 256 megabytes

You are given an $n \times m$ grid a of non-negative integers. The value $a_{i,j}$ represents the depth of water at the i-th row and j-th column.

A lake is a set of cells such that:

- each cell in the set has $a_{i,j} > 0$, and
- there exists a path between any pair of cells in the lake by going up, down, left, or right a number of times and without stepping on a cell with $a_{i,j} = 0$.

The volume of a lake is the sum of depths of all the cells in the lake.

Find the largest volume of a lake in the grid.

Input

The first line contains a single integer t ($1 \le t \le 10^4$) — the number of test cases.

The first line of each test case contains two integers n, m ($1 \le n, m \le 1000$) — the number of rows and columns of the grid, respectively.

Then n lines follow each with m integers $a_{i,j}$ ($0 \le a_{i,j} \le 1000$) — the depth of the water at each cell.

It is guaranteed that the sum of $n \cdot m$ over all test cases does not exceed 10^6.

Output

For each test case, output a single integer — the largest volume of a lake in the grid.

Example

input Copy

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

output Copy

```
10
0
7
16
21
```


→ Last submissions

Submission	Time	Verdict
315248616	Apr/13/2025 10:11	Accepted
315248190	Apr/13/2025 10:07	Wrong answer on test 2
315247762	Apr/13/2025 10:03	Wrong answer on test 2

→ Problem tags

dfs and similar | dsu | graphs | implementation | *1100

No tag edit access

→ Contest materials

- Announcement (en)
- Tutorial (en)