

Contest Duration: 2025-05-24(Sat) 22:00 (<http://www.timeanddate.com/worldclock/fixedtime.html?iso=20250524T2100&p1=248>) - 2025-05-24(Sat) 23:40 (<http://www.timeanddate.com/worldclock/fixedtime.html?iso=20250524T2240&p1=248>) (local time) (100 minutes)

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D - Domino Covering XOR

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Time Limit: 2 sec / Memory Limit: 1024 MiB

Score : 425 points

Problem Statement

There is a grid with H rows and W columns. Let (i, j) denote the cell at the i -th row from the top ($1 \leq i \leq H$) and the j -th column from the left ($1 \leq j \leq W$).

Cell (i, j) ($1 \leq i \leq H, 1 \leq j \leq W$) has a non-negative integer $A_{i,j}$ written on it.

Let us place zero or more dominoes on the grid. A domino covers two adjacent cells, namely one of the following pairs:

- cells (i, j) and $(i, j + 1)$ for $1 \leq i \leq H, 1 \leq j < W$;
- cells (i, j) and $(i + 1, j)$ for $1 \leq i < H, 1 \leq j \leq W$.

No cell may be covered by more than one domino.

For a placement of dominoes, define its **score** as the bitwise XOR of all integers written in cells **not** covered by any domino.

Find the maximum possible score.

► What is bitwise XOR?

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Constraints

- $1 \leq H$
- $1 \leq W$
- $HW \leq 20$
- $0 \leq A_{i,j} < 2^{60} (1 \leq i \leq H, 1 \leq j \leq W)$
- All input values are integers.

Input

The input is given from Standard Input in the following format:

```
H W
A1,1 A1,2 ... A1,W
A2,1 A2,2 ... A2,W
⋮
AH,1 AH,2 ... AH,W
```

Output

Output the answer.

Sample Input 1

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```
3 4
1 2 3 8
4 0 7 10
5 2 4 2
```

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Sample Output 1

Copy

15

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The grid is as follows:

1	2	3	8
4	0	7	10
5	2	4	2

For example, the placement below yields a score of 15.

	0	7	10
			2

No placement achieves a score of 16 or higher, so output 15.

Sample Input 2

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```
1 11
1 2 4 8 16 32 64 128 256 512 1024
```

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Sample Output 2

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```
2047
```

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You may also choose to place no dominoes.

Sample Input 3

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```
4 5
74832 16944 58683 32965 97236
52995 43262 51959 40883 58715
13846 24919 65627 11492 63264
29966 98452 75577 40415 77202
```

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Sample Output 3

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```
131067
```

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