A new gangster is trying to take control of the city. He makes a list of his N adversaries (e.g. *gangster 1*, *gangster 2*, ... *gangster $N-1$*, *gangster N*) and plans to get rid of them.

K mercenaries are willing to do the job. The gangster can use any number of these mercenaries. But he has to honor one condition set by them: they have to be assigned in such a way that they eliminate a consecutive group of gangsters in the list, e.g. *gangster i, gangster $i+1$, ..., gangster $j-1$, gangster j*, where the following is true: $1 \le i \le j \le N$.

While our new gangster wants to kill all of them, he also wants to pay the least amount of money. All mercenaries charge a different amount to kill different people. So he asks you to help him minimize his expenses.

Input Format

The first line contains two space-separated integers, N and K. Then K lines follow, each containing N integers as follows:
The jth number on the ith line is the amount charged by the ith mercenary for killing the jth gangster on the list.

Constraints

- $1 \le N \le 20$
- $1 \le K \le 10$
- $0 \le amount\ charged \le 10000$

Output Format

Just one line, the minimum cost for killing the N gangsters on the list.

Sample Input

```
3 2
1 4 1
2 2 2
```

Sample Output

```
 5
```

Explanation

The new gangster can assign *mercenary 1* to kill *gangster 1*, and *mercenary 2* to kill *gangster 2* and *gangster 3*.