APIO '09 P1 - Digging for Oil

Time limit: 0.75s **Memory limit:** 128M

The Government of Siruseri has decided to auction off land in its oil-rich Navalur province to private contractors to set up oil wells. The entire area that is being auctioned off has been divided up into an $M \times N$ rectangular grid of smaller plots.

The Geological Survey of Siruseri has data on the estimated oil reserves in Navalur. This information is published as an $M \times N$ grid of non-negative integers, giving the estimated reserves in each of the plots. In order to prevent a monopoly, the government has ruled that any contractor may bid for only one $K \times K$ square block of contiguous plots. The AoE oil cartel consists of a group of 3 colluding contractors who would like to choose 3 disjoint blocks so as to maximize their total yield. Suppose that the estimated oil reserves are as described below:

```
1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1
1 8 8 8 8 8 1 1 1
1 8 8 8 8 8 1 1 1
1 8 8 8 8 8 1 1 1
1 1 1 1 8 8 8 1 1
1 1 1 1 1 1 8 8 8
1 1 1 1 1 1 9 9 9
1 1 1 1 1 1 9 9 9
```

If $K = 2$, the AoE cartel can take over plots with a combined estimated reserve of 100 units, whereas if $K = 3$ they can take over plots with a combined estimated reserve of 208 units. AoE has hired you to write a program to help them identify the maximum estimated oil reserves that they can take over.

Input Specification

The first line of the input contains three integers M, N and K, where M and N are the number of rows and columns in the rectangular grid of plots and K is the size of the square block for which bids can be made. The next M lines contain N non-negative integers — each line describes the estimated oil reserves for one row of plots.

Output Specification

A single line with a single integer indicating the maximum estimated oil reserves that can be taken over by the AoE cartel.

Test Data

You may assume that $K \leq M$ and $K \leq N$ and that at least three disjoint $K \times K$ blocks are available. In 30% of the inputs, $M, N \leq 12$. In all inputs, $M, N \leq 1500$. The estimated oil reserve for each plot is always non-negative and

never exceeds 500.

Sample Input

```
9 9 3
1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1
1 8 8 8 8 8 1 1 1
1 8 8 8 8 8 1 1 1
1 8 8 8 8 8 1 1 1
1 1 1 1 8 8 8 1 1
1 1 1 1 1 1 8 8 8
1 1 1 1 1 1 9 9 9
1 1 1 1 1 1 9 9 9
```

Sample Output

```
208
```