
10. Realtor World

Program Name: Realtor.java

Input File: realtor.dat

Scott works for a large realty firm. His boss is requiring each realtor in his firm to select a portion of a nearby housing area to contact the residents about selling their homes. The housing area is rectangular in shape and, ignoring the streets, there are m houses across and n houses down. Each realtor is to select a sub-rectangle of contiguous houses within the housing area. The realtor who is most successful will be rewarded with an all-expense paid vacation for a family of 4.

Scott, one of the realtors, has decided that he needs a program to help him select his sub-rectangle. A sub-rectangle must be at least a 1×1 rectangle. After some investigation, he has developed a system that will give each house a value between -10 and 10, inclusive, based on how long a house has been owned, how long the owners had owned their previous house, value of the house, and several other criteria.

You are to write a program for Scott that will determine the sub-rectangle with greatest value. For example, given the housing area to the right, Scott has given the values of each house. The sub-rectangle containing 9, 2, -4, 1, -1, 8 sums to 15 and that is the largest value for any possible sub-rectangle.

0	-2	-7	0
9	2	-6	2
-4	1	-4	1
-1	8	0	-2

Input

The first line of input will contain a single integer n that indicates the number of housing areas to follow. For each housing area, there will be the following:

- One line with two positive integers r and c , separated by a space, to denote the number of rows and columns in the housing development.
- r lines, each with c integers separated by a space and in the range $[-10,10]$.

Output

For each housing area, you will print one line with the value of the largest valued sub-rectangle.

Note: There will always be a unique largest valued sub-rectangle.

Example Input File

```
2
4 4
0 -2 -7 0
9 2 -6 2
-4 1 -4 1
-1 8 0 -2
4 6
3 3 -3 -3 4 -4
2 8 3 8 9 10
-4 -4 3 7 -5 3
6 2 -2 4 -6 8
```

Example Output to Screen

```
15
52
```