

# Problem A

**Problem ID:** 72abc97185c9ae01

**CPU Time limit:** 1 second

**Memory limit:** 1024 MB

**Difficulty:** medium

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A long art gallery has  $2N$  rooms. The gallery is laid out as  $N$  rows of 2 rooms side-by-side. Doors connect all adjacent rooms (north-south and east-west, but not diagonally). The curator has been told that he must close off  $k$  of the rooms due to staffing cuts. Since visitors must enter using either room at one end of the gallery, proceed through the gallery, and exit from either room at the other end, he must not close off any two rooms that would block passage through the museum. That is, any two rooms in the same row, or two rooms that touch diagonally in adjacent rows. Furthermore, he has determined how much value each room has to the general public, and now he wants to close off those  $k$  rooms that leave the most value available to the public, without blocking passage through the museum.

7	8
4	9
3	7
5	9
7	2
10	3
0	10
3	2
6	3
7	9

**Figure 1:** The art gallery shows an optimal solution to the third sample input problem. The gray rooms show those that should be closed.

## Input

Input will consist of multiple problem instances (galleries). Each problem instance will begin with a line containing two integers  $N$  and  $k$ , where  $3 \leq N \leq 200$  gives the number of rows, and  $0 \leq k \leq N$  gives the number of rooms that must be closed off. This is followed by  $N$  rows of two integers, giving the values of the two rooms in that row. Each room's value  $v$  satisfies  $0 \leq v \leq 100$ . A line containing 0 0 will follow the last gallery.

## Output

For each gallery, output the amount of value that the general public may optimally receive, one line per gallery.

### Sample Input 1

```
6 4
3 1
2 1
1 2
1 3
3 3
0 0
0 0
```

### Sample Output 1

```
17
```

### Sample Input 2

```
4 3
3 4
1 1
1 1
5 6
0 0
```

### Sample Output 2

```
17
```

### Sample Input 3

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

### Sample Output 3

```
102
```