

## HOT-SPOT on the surface of a chip

Because of power consumption, the surface of a chip tends to heat up during operation. Using an expensive piece of equipment, called a thermo-camera, it is possible to take a kind of picture of a chip during its operation mode, obtaining a temperature matrix.

```
77 71 78 84 73 82 77 73 80 70 70 80 77 86 78
82 86 75 83 85 88 82 70 82 76 75 75 87 74 71
81 80 92 78 79 85 80 78 72 70 73 71 90 81 87
81 81 86 87 71 84 90 85 87 73 84 70 77 88 77
79 72 78 88 78 89 82 80 81 78 77 78 89 82 71
74 73 77 83 76 87 88 90 73 78 75 92 77 89 76
76 75 76 90 76 81 70 75 82 76 71 70 74 73 76
75 87 78 72 84 90 73 89 80 79 81 77 79 71 76
75 77 83 84 86 73 83 84 84 82 82 76 88 77 86
74 84 74 81 89 86 76 79 73 81 72 79 88 77 83
82 81 83 83 87 90 70 70 84 71 75 84 78 87 97
87 80 86 79 75 79 78 90 85 76 89 76 76 88 78
75 83 84 79 79 80 90 78 78 71 86 75 77 74 79
89 76 81 78 87 89 70 86 85 72 86 76 77 87 82
85 74 70 77 87 88 81 78 75 77 86 76 81 85 87
```

For each picture, the thermo-camera produces a matrix of **positive integer values** of size **n** rows and **m** columns, where each value corresponds to the (average) share of a portion of the chip, the size of which depends on the resolution of the thermo-camera. In the example above, the thermal camera captures 15x15 values.

The program in Python required must identify the **hot-spots**, i.e., the points on the chip with a temperature value **strictly greater** than the surrounding portions at a distance **D**, i.e., the numbers in the matrix that represent the **strictly maximum value** in a square of size **2\*D+1** (not necessarily contained in the given matrix) having the position of the number itself as its center. For example, a hot-spot with distance **D=2** extracted from the matrix in the example above is shown in the example below:

```
77 71 78 84 73
82 86 75 83 85
81 80 92 78 79
81 81 86 87 71
79 72 78 88 78
```

The program should open the *input\_file.csv* file containing the matrix (assume that the file contains no format errors), while the size **D** should be defined as constant. Let the matrix be printed on the screen with all values replaced by the “-” (dash) character, except those of hot-spots.

Expected output:

[illegible]