Let the array be $A: [n^*m^*bin]$ . Let's try for a solution of the form

```plaintext
for i := 0;..n
do for j := 0;..m
  do something od od
```

with execution time $n \times m$ . (The for-loops (Chapter 5) are never necessary.) Part way through execution, we know the size of the largest true square in the upper region of the following picture, which is an informally written condition.

![Diagram of a square array](image)

To increase the upper region by one item we need to know the size of the largest true square whose bottom right corner is the one new item. Imagine a new array $B: [n^*m^*nat]$ so that $B_{ij}$ is the length of a side of the largest true square with bottom right corner at $ij$ . Clearly, $\neg A_{ij} \Rightarrow B_{ij} = 0$ . Now suppose $A_{ij}$ . There are four cases to consider.

![Four cases of square array](image)

In all four cases, $b = x \downarrow y \downarrow z + 1$ . We need only one row of the $B$ array, plus three variables $x$ , $y$ , and $z$ .

```
0
```

For each row, $x$ and $y$ start at 0 so that $x \downarrow y \downarrow z + 1 = 1$ .

```
s := 0.
for i := 0;..n
do  x := 0.  y := 0.
  for j := 0;..m
do  z := B_{j}.
    B := j \rightarrow if A_{ij} then x \downarrow y \downarrow z + 1 else 0 fi | B.
    x := z.  y := B_{j} od od
```

```