**Practical Exercise**

Consider we have a matrix of **N** x **M** which consist of integer values. Here *N* is the number of rows and *M* is the number of columns.

Example:

Matrix of 5 x 5

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 10 | 17 | 8 | 19 | 15 |
| 6 | 22 | 11 | 2 | 25 |
| 23 | 14 | 1 | 21 | 4 |
| 16 | 3 | 5 | 12 | 18 |
| 7 | 20 | 13 | 24 | 9 |

We need to write a program which will produce the output matrix of **P** x **Q**, where **P** = ***N****+1* and **Q** = ***M****+1* by calculating **MAX** or **MIN** value from each row and column, and append those values as new elements of that row and column.

The value at *(P,Q)* position of the new matrix should have **MAX** or **MIN** value from the input matrix based on whatever operation is selected to form new matrix.

If I choose **MAX** operation, then output should be:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 10 | 17 | 8 | 19 | 15 | **19** |
| 6 | 22 | 11 | 2 | 25 | **25** |
| 23 | 14 | 1 | 21 | 4 | **23** |
| 16 | 3 | 5 | 12 | 18 | **18** |
| 7 | 20 | 13 | 24 | 9 | **24** |
| **23** | **22** | **13** | **24** | **25** | **25** |

If I choose **MIN** operation, then output should be:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 10 | 17 | 8 | 19 | 15 | **8** |
| 6 | 22 | 11 | 2 | 25 | **2** |
| 23 | 14 | 1 | 21 | 4 | **1** |
| 16 | 3 | 5 | 12 | 18 | **3** |
| 7 | 20 | 13 | 24 | 9 | **7** |
| **6** | **3** | **1** | **2** | **4** | **1** |

Notes:

* You can use any programming language you are familiar with
* For sorting you are not allowed to use any kind of inbuilt sorting functions
* Try to minimize the looping iterations as much as possible
* Input matrix of size **N** x **M** should be dynamic, that means there should be a code/snippet which randomly generates integer values and initialize those values in the matrix.

We appreciate you taking time for reviewing these questions. Do let us know in case of any doubt or question.

Best of luck.