Problem Set 3 Exercise #21: Matrix Normalization

Reference: Lecture 8 notes

Learning objective: Two-dimensional array

Estimated completion time: 30 minutes

Problem statement:

Write a program **PS3_Ex21_Normalization.java**.

Your program should contain a static method

```
void normalizeMatrix(double[][] mtx)
```

that normalizes the values in 2D array **`mtx`** using the following equation:

$$\overline{mtx}_{i,j} = \frac{mtx_{i,j} - min_{mtx}}{max_{mtx} - min_{mtx}}$$

where $\overline{mtx}_{i,j}$ is the normalized value in slot $mtx[i][j]$ and min_{mtx} and max_{mtx} are the minimum and maximum values in **`mtx`** respectively.

You may assume that not all the elements in **`mtx`** have the same value.

Correct your output of real numbers to two decimal places.

Sample run #1:

```
Enter the size of the matrix: 4 5
Enter elements row by row:
1 0 1 0 1
0 1 0 1 0
1 0 1 0 1
0 1 0 1 0
Normalized matrix:
1.00 0.00 1.00 0.00 1.00
0.00 1.00 0.00 1.00 0.00
1.00 0.00 1.00 0.00 1.00
0.00 1.00 0.00 1.00 0.00
```

Sample run #2:

```
Enter the size of the matrix: 4 5
Enter elements row by row:
67 50 26 3 35
50 26 3 35 67
26 3 35 50 67
3 26 35 50 67
Normalized matrix:
1.00 0.73 0.36 0.00 0.50
0.73 0.36 0.00 0.50 1.00
0.36 0.00 0.50 0.73 1.00
0.00 0.36 0.50 0.73 1.00
```

Useful tip:

You need to find out the maximum and minimum values in the matrix, which has been done in Ex #20.