Homework 3 : Find a Sequence and Reverse it in a Matrix

In this homework, you will develop an application which will find a sequence of integers from 0 to 9 in a given matrix and update the matrix by reversing the sequence. Sequence search can be performed as described below:

- First you need to find the starting point of the sequence. Any location containing a 0 value is a candidate starting point.
- After selecting a starting point you should check for values in the neighbour locations. For the below example, neighbours of **0** are 1(up), 5(right), 6 (bottom) and 7 (left)

  ```
  2 1 3
  7 0 5
  9 6 8
  ```

- Then you should check the values of neighbours whether they contain the next value (current value +1). Above, only the up neighbour contains the next value
- Repeat the previous step for the neighbor containing the correct value until you find a sequence to the location containing 9.

Below an example Input matrix is given and the sequence you should find is marked

```
2 8 3 7 4 7 2 4 7 5
7 7 8 5 8 5 9 4 1 7
5 8 3 2 1 3 2 9 8 1
1 0 4 7 0 5 0 9 0 5
8 6 5 0 6 0 1 2 1 9
9 7 8 5 9 0 4 3 2 6
9 4 9 5 9 0 4 8 7 7
9 3 6 3 9 3 3 7 8 4
6 6 9 7 0 3 5 6 7 1
7 1 1 7 6 4 5 3 1 1
```

The input is given as a file and a method which reads the file already exists in hw3 folder of https://bitbucket.org/OzgurKilic/homeworks repository. Get the **FindSequence.java** and **matrix.txt** from the above repository. Modify the FindSequence.java so it will find the sequence and reverse the numbers of the seqeunce in the matrix. For the above example your output should be as below,

```
2 8 3 7 4 7 2 4 7 5
7 7 8 5 8 5 9 4 1 7
5 8 6 7 8 3 2 9 8 1
1 0 5 7 9 5 0 9 0 5
8 3 4 0 6 0 1 2 1 9
9 2 1 5 9 0 4 3 2 6
9 4 0 5 9 0 4 8 7 7
9 3 6 3 9 3 3 7 8 4
6 6 9 7 0 3 5 6 7 1
7 1 1 7 6 4 5 3 1 1
```

You may assume that the values in the matrix are between 0 and 9 and matrix size is 10 x 10 and there exists at most one sequence in the matrix.

Use RECURSION while searching for a sequence.

Due date: 26.02.2018 13:30

Submission:
Submit your homework as defined in HomeworkSubmission document. Your java file should be located in the "**hw3**" directory in your repository. Failing in any step described in the document may affect your grade. The document is available in the Homework section of the Resources tab of the course piazza web page.