COMP 482 Project 4
Due: 2355 December 17, 2020

Idea: You will be given a 2 dimensional array of integers. You may start at any location and can only move down or to the right and only if the value is smaller. You want to find the number of entries in longest path you can take.

Input Format: The input file will be called input4.txt and be in the same directory as the java and class files. The first line will be the dimensions of the array seperated by whitespace (ie rows columns). Each remaining line will be a whitespace separated list of the values of a row.

Output: The output will be the length (number of entries) of the longest path which starts on any square of the array, can only continue to a smaller numerical value, and can only continue to the adjacent square directly to the right or directly below. You must find this value using dynamic programming (not brute force).

Examples: If input4.txt contained

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

then the output would be

```
5
```

because there is the path 9-8-7-4-1 with 5 squares and no path is longer (there are some ties).

If input4.txt contained

```
5 7
11 13 18 12 11 16 40
12 17 15 14 19 12 41
14 15 16 17 18 19 42
16 30 28 20 24 25 43
18 20 50 18 16 10 44
```

then the output woud be

```
6
```

because there is the path 30-28-20-18-16-10 with 6 squares and no path is longer.

How: The exact details are for you to determine, but you must use dynamic programming. It is likely that this project will require more time to figure out the recursion than to code the solution.

Stray Thoughts:
I will be using a recent version of Java (likely the current version Java SE 15, but if Oracle releases a new version I may upgrade).
You'll be submitting only dot-java files (no class files or input files required or wanted).
You are allowed to use any of the standard features, classes, methods in Java. You can use as many or as few files as you feel appropriate, but the main method should be located in a file called Project4.java. Otherwise the project won't compile/run with the required commands.
Some IDEs default to placing java files into packages. This will likely cause the commands 'javac Project4.java' and/or 'java Project4' to fail. Either use an IDE that does not place java files into packages OR learn your preferred IDE well enough to avoid this issue OR delete any package lines before submission.
Students often decide to change or modify the format of the input or ouput. Sometimes it makes the project easier for them. Other times a student thinks it is an improved design. You may or may not be right, but don't change the input or output format. Doing so will result in your project getting a low score.
It is likely that many students won't read this far. There is no need to let me know you've read this.
I will likely use the sample input files above while grading, but I'm also likely to use other much larger input files (possibly containing millions of data items, but no more than the JVM limit on arrays $\approx 2^{30}$).
I suggest you finish you project several days in advance. This way you have time and opportunity to ask any last

questions and verify that what you upload satisfies the requirements.
Your project should be written and understood by you. Helping or receiving help from others is allowed, but significant shared source code indicates that you either did not write/understand what you submitted or you assisted another in submitting code they did not write or understand.