SI100B, Spring 2019
Homework 1: Counting the Lines

February 25, 2019

1 Problem Description

The goal of this homework is to implement a simple program that takes an input of $m \times n$ ($m, n \in [0, 500]$) matrix and outputs the number of vertical and horizontal lines represented by "x" as shown in **Figure 1**. **A line is represented by at least two consecutive "x"s**.

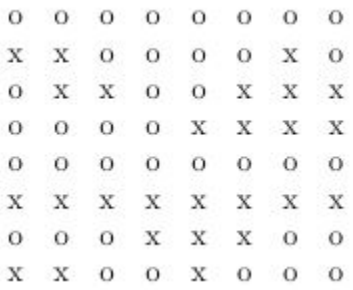

Figure 1: Example Matrix

Consider the above 8×8 matrix, the output should be: 7 horizontal lines, 7 vertical lines, 8 diagonals and 6 anti-diagonals. **Figure 2 to 5** show how we get the answers.

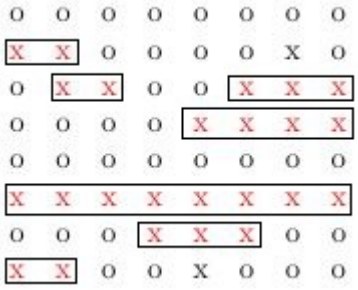

Figure 2: Horizontal Lines

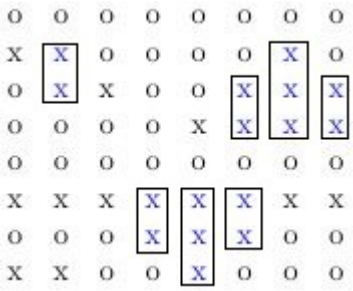

Figure 3: Vertical Lines

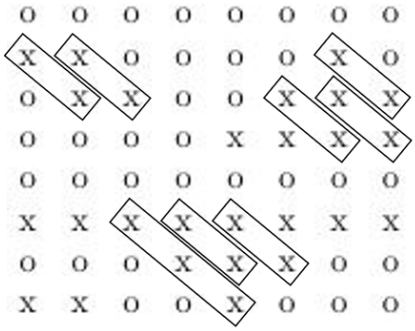

Figure 4: Diagonal

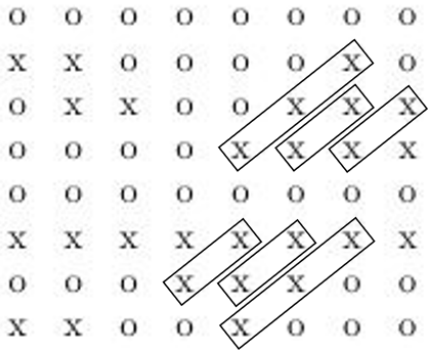

Figure 5: Anti-Diagonal

2 Requirements

- The program uses file input and standard output. A template for input and output has been given to make it easier for to deal with IO issues (has been uploaded into your Gitlab repo).
- It prints out **a string** containing **four answers** in the terminal, **separated by a whitespace between each number**. It must be in the following format:

  `x y z k`

  where x is the number of **horizontal lines**, y is the number of **vertical lines** in the matrix, z is the number of **diagonals** and k is the number of **anti-diagonals**. For example, the output of the example in Figure 1 is

  `7 7 8 6`

- Due:

  23:59:59, March 7 (Wednesday), 2019 CST

  No late submission will be accepted

3 Test Cases

We have uploaded a pair of sample input and output onto Piazza. You can use them to test whether your program performs as expected.

4 Submission

We design a Gitlab-based online judging system as submission platform *(let me express special thanks to our TA - Q7 dalao)*. Detailed submission manual has been posted onto Piazza. Also, we will demonstrate how to use this system on Tuesday (February 26)'s Discussion.

In order to prevent you from abusing our OJ as a debugging tool or, what is worse, try to test out what our test cases are, we enforce following 2 rules:

- We deliberately slow down the pace of grading, which will take you 1 to 2 minutes to get your result of a submission. Please hand in a new version after you see the result of your current submission.
- You have 30 chances of grading (i.e. git tag) in this homework. You are able to require grading at most 10 times every 24 hours. If you hand in more 30 times, **each extra submission will lead to 10% deduction**.

5 Anti-Plagiarism Policy

We enforce academic integrity strictly. If you participate in any form of cheating, you will fail this course immediately. Examples of cheating on homework include (but are not limited to):

- Read or possess solution code written by other people.
- Submit to the gradebot code written by other people or derived from the code written by other people.
- Allow other people to read or possess your solution code either actively or passively, e.g., by posting your code on a web site or leaving the computer containing your code unattended and unlocked. You are responsible for exercising due diligence in safeguarding your code.

You can view full edition on Piazza.