Assignment 1: MatrixT

Python Language

1 Code of Conduct

All assignments are graded, meaning we expect you to adhere to the academic integrity standards of Yale-NUS College. To avoid any confusion regarding this, we will briefly state what is and isn't allowed when working on an assignment.

Any documents and program code that you submit must be fully written by yourself. You can, of course, discuss your work with fellow students, as long as these discussions are restricted to general solution techniques. Put differently, these discussions should not be about concrete code you are writing, nor about specific results you wish to submit. When discussing an assignment with others, this should never lead to you possessing the complete or partial solution of others, regardless of whether the solution is in paper or digital form, and independent of who made the solution, meaning you are also not allowed to possess solutions by someone from a different year or course, by someone from another university, or code from the Internet, etc. This also implies that there is never a valid reason to share your code with fellow students, and that there is no valid reason to publish your code online in any form.

Every student is responsible for the work they submit. If there is any doubt during the grading about whether a student created the assignment themselves (e.g. if the solution matches that of others), we reserve the option to let the student explain why this is the case. In case doubts remain, or we decide to directly escalate the issue, the suspected violations will be reported to the academic administration according to the policies of Yale-NUS.

2 Introduction

The Matrix Total, named MatrixT, is a grid with 3 rows and 3 columns, show below

4 9 2

3 5 7

8 1 6

The grid contains the numbers 1 through 9.

The sum of each row, each column, and each diagonal add up to the same total, that is 15.

Write a program that accepts a two-dimensional list as input and determines whether the list is a MatrixT. Test the program with input that are MatrixT or not.

The program prints either:

The matrix and the result: This is a MatrixT

The matrix and the result: This is NOT a MatrixT

The algorithm is very simple. Please note that there are several possible MatrixT. You need to add separately each column, each row, and each diagonal, and compare if the results are the same or not.

3 Implementation and Tests

The program must be implemented in Python using **Lists** only. If you implement this program using other data structures, such as Sets and Dictionaries (to be learned later), your program will not be graded.

Test the program with at least these two MatrixT

6 7 2

1 5 9

8 3 4

This is a MatrixT

And

18 81 36

63 45 27

54 9 72

This is a MatrixT

Test the program with at least these two NOT MatrixT

1 2 3

7 8 9

4 5 6

This is NOT a MatrixT

And

26 69 18

67 13 45

10 8 99

This is NOT a MatrixT

4 Grading

This simple and correct version of the program is worth 15 points.

Note that your solution must work in Python programming language. In case your code does not work your submission will not be graded.

My advice to you is to implement the basics first, and make sure you have a running program that works. Unless you are willing to improve the program with extra feature; for instance, make the matrix size generic, i.e. chosen by the user, and allow inputting matrices 4X4 or even 9X9, probably you won't have time during this course, although it is worth spending time thinking about an algorithm to implement your ideas. Leave it for the holidays -☺

5 Submission

The deadline of this assignment is exactly 7days, **the firm deadline is on (Sunday) February 5th at 23:55**. Please submit one file containing your **Python** program. If your email is xyz@u.yale.nus.edu, please name your program **matrixT-xyz.py**

Also, please email your source code to the grader Ozair Faisal (ozair.faisal@u.yale.nus-edu.sg) by the above deadline. Late submissions will be penalized by 50% per 24 hours.

Please write lots of comments in your program to facilitate the grader's understand of your line of thought.

Good luck!