CS410P

LAB 12L

Purpose

The purpose of this assignment is to give you practice with two-dimensional lists.

Problem

Write a program that accepts the number of rows and columns of a 2-D list from the user (values between 1 and 10). The program will call a function to initialize a 2-D list of the size provided by the user with random values between 0 and 100.

After creating a 2-D list representing a matrix we would like to print the matrix in a reasonable row/column format.

Next we want to compute and print some row and column sums. We want to compute four different sums – one for the first row, one for the last row, one for the first column, one for the last column (i.e. we want to compute and print the sum of each edge).

Next we want to double the diagonal elements of the matrix as long as it's a square matrix. If we compute the diagonal elements we need to print the new matrix (by calling the same function that prints the matrix again).

Requirements

You are being provided with a file that contains the main() function (in the public folder). You cannot modify this file but you need to create a file called functions_2D.py with all the functions that are needed. You will need to read through the source file given to you and write the functions that are being called.

You must use a 2-D list in Python for this program (cannot use Numpy or any other arrays from other libraries or packages).

Input

The user provides values for the number of rows and columns (both must be within the range 1 and 10 both inclusive).

Output

See sample outputs in the public folder. Keep in mind that your 2-D list values are likely to be different than mine since they are random numbers!

Grade Key

A	Initialize 2-D list with random values between 0 and 100 for specified rows & columns, return 2-D list	**20**
B	Prints 2-D list in matrix/grid format, function created with appropriate arguments, no return value	**20**
C	Function created for computing sums of rows and columns, results are accurate, function arguments and return values are appropriate	**20**
D	Function created to double diagonal elements, function arguments and return values appropriate	**20**
E	Works accurately for different values for rows and columns	**10**
F	All functions written in a separate file imported into the main source file	**10**