Scientific Computing Homework 1

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Add and Max

Important info for all homework

Given two matrices A and B (possibly of different sizse), write a function to find the maximum element of their sum. Note that if A and B are not of the same size, we need to expand each of them before the addition, as shown in the following example:

$$A=\begin{bmatrix}2&3\\1&5\\4&6\end{bmatrix}, B=\begin{bmatrix}1&2&3&7\\5&4&2&3\end{bmatrix}, A+B=\begin{bmatrix}3&5&3&7\\6&9&2&3\\4&6&0&0\end{bmatrix} \Rightarrow \text{addAndMax(A, B) returns 9.}$$

Here is a file list of example code (to download them all: exampleCode.zip) for you to start with. The readme.txt of the example code folder is shown next:

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This is the readme.txt file in example code for HW01 of Scientific ComputingaddAndMax

Your submission (you only need to submit one of the following):
    Python: addAndMax.py
    Matlab: addAndMax.m

Example input/output files:
    input.txt: input file
    output.standard.txt: output file (the correct answer)

Input/output file format:
    Input:
        Each two-row is a matrix, and each four-row is matrices A and B. For each four-row, you need to output one answer.
        For instance, "input.txt" has 80 rows, indicating there are 20 pairs of matrices A and B, and you need to output 20 answers.
        The format of each four rows is explained as follows.
        3 2: [row column] for matrix A
        2 3 1 5 4 6: Elements in A ==> A = [[2, 3], [1, 5], [4, 6]]
        2 4: [row column] for matrix B
        1 2 3 7 5 4 2 3: Elements in B ==> B = [[1, 2, 3, 7], [5, 4, 2, 3]]
    Output:
        A column of numbers, with each number being an answer to given matrices A and B

Example main program to run the test:
    Python: mainTest.py, with the following command to run it.
        python mainTest.py < input.txt > output.python.txt
    Matlab: mainText.m, with the following command (within matlab) to run it.
        mainText input.txt output.m.txt

Others
    addAndMaxSP.p is a standard program that can be invoked just like an M file in MATLAB to check against your submission of "addAndMax.m".

Hints:
    Python: You may use numpy's functions, including zeros, shape, max, etc.
    Matlab: Some related functions are size, zeros, max, etc.
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Last updated on 03/26/2020 23:03:46.