Numerical Method

National Cheng Kung University Department of Engineering Science

Instructor: Chi-Hua Yu

HW 2

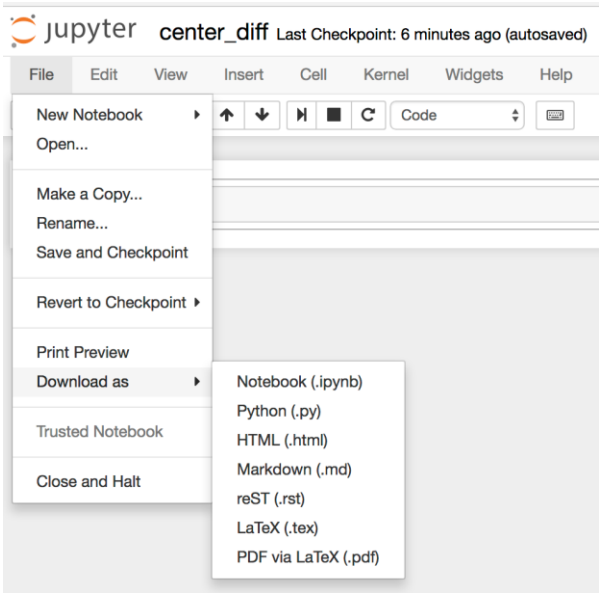
Programming, Due 09:00, Wednesday, March 16th, 2022

注意事項：

1. Homework 的時間為公布題目後至下次上課前結束(上課當天 09:00)。
2. 請在規定的時段內完成作業，並用你的學號與 HW number 做一個檔案夾 (e.g., N96091350_HW2), 將你的全部 ipynb 檔放入檔案夾，壓縮後上傳至課程網站 (e.g., N96091350_HW2.zip)，超過期限後不予補交。

Homework Submission Procedure (請仔細閱讀)

1. You should submit your Jupyter notebook and Python script (`*.py`, in Jupyter, click File, Download as, Python (`*.py`)).



2. Name a folder using your student id and lab number (e.g., n96081494_HW1), put all the python scripts into the folder and zip the folder (e.g., n96081494_HW1.zip).

3. Submit your lab directly through the course website.

1. (100%) Name your file `MatrixAddition.ipynb`. We can use the two-dimensional list to represent a 2D matrix and perform some basic matrix operations. Write a function `matrix_add` that takes two matrices a and b and return the addible status to indicate whether a and b has the same dimensions and the resulting matrix c

```
def matrix_add(a, b)
```

In order to be added, the two matrices must have the same dimensions and the same or compatible types of elements. For example,

$$\begin{pmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{pmatrix} + \begin{pmatrix} b_{11} & b_{12} & b_{13} \\ b_{21} & b_{22} & b_{23} \\ b_{31} & b_{32} & b_{33} \end{pmatrix} = \begin{pmatrix} a_{11}+b_{11} & a_{12}+b_{12} & a_{13}+b_{13} \\ a_{21}+b_{21} & a_{22}+b_{22} & a_{23}+b_{23} \\ a_{31}+b_{31} & a_{32}+b_{32} & a_{33}+b_{33} \end{pmatrix}$$

Use the following codes and outputs to test your implementation:

Sample Run 1

```
a = [[2,3,1],[4,6,2]]
b = [[1,2,3],[3,4,5]]
addible, c = matrix_add(a,b)
if addible: print(c)
```

```
a = [[2,3,1],[4,6,2]]
b = [[1,2,3],[3,4,5]]
```

```
addible, c = matrix_add(a,b)
if addible: print(c)
```

```
[[3, 5, 4], [7, 10, 7]]
```

Sample Run 2

```
a = [[2,3,1],[4,6,2]]
b = [[1,2],[3,4]]
addible, c = matrix_add(a,b)
if addible: print(c)
```

```
a = [[2,3,1],[4,6,2]]
b = [[1,2],[3,4]]
```

```
addible, c = matrix_add(a,b)
if addible: print(c)
```

```
Matrix dimensions are not compatible for addition
```

Sample Run 3

```
a = [[2,3,1],[4,6,2]]
b = [[1,2],[3,4],[3,4]]
addible, c = matrix_add(a,b)
if addible: print(c)
```

```
a = [[2,3,1],[4,6,2]]
b = [[1,2],[3,4],[3,4]]
```

```
addible, c = matrix_add(a,b)
if addible: print(c)
```

```
Matrix dimensions are not compatible for addition
```