**Numerical Method**

**National Cheng Kung University** Department of Engineering Science

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**HW 3**

**Programming, Due 09:00, Wednesday, March 23th , 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_HW3), 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_HW3.zip)，超過期限後不予補交。

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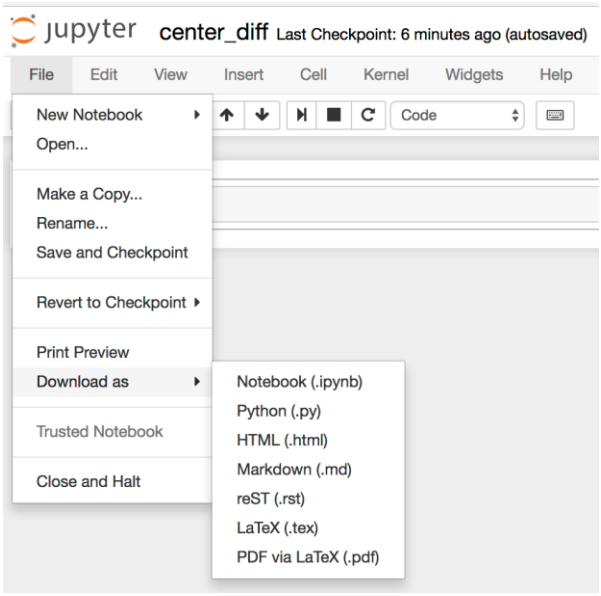
Homework Submission Procedure (請仔細閱讀)

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 Jupyter notebook `fraction` and Python script `fraction.py`. A Fraction is user defined datatype to present fraction numbers. The operations for the Fraction type will allow a Fraction data object to behave like any other numeric value. We need to be able to add, subtract, multiply, and divide fractions. We also want to be able to show fractions using the standard “slash” form, for example 3/5. In addition, all fraction methods should return results in

their lowest terms so that no matter what computation is performed, we always end up with the most common form.

The interface for Fraction should look like:
(You can choose to use the `gcd` written by yourself in lab2 or import `gcd` from `math`.)

```
from math import gcd
class Fraction(object):
    """
    User-defined ojbect to represent numeric fractions
    The top value, known as the numerator, can be any integer.
    The bottom value, called the denominator, can be any integer
greater than 0
    """
```

Below is the running example :

Please name Jupyter notebook `HW3` and import `Fraction` to display the results.

```
1 from fraction import Fraction
```

```
1 x = Fraction(1,2)
2 y = Fraction(2,3)
3 print(x+y)
4 print(x == y)
5
```

```
7/6
False
```

```
1 print(x != y)
```

```
True
```

```
1 print(x-y)
```

```
-1/6
```

```
1 print(x*y)
```

```
1/3
```

```
1 print(x/y)
```

```
3/4
```