# Jupyter Notebook Presentation

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# Jupyter Notebook Tutorial Presentation

**Presented by Jiahui Wei** This is a Jupyter Notebook tutorial. Presented at CMPS263 Winter 2017.

## 0.1 Why Jupyter ?

You can view & run Python code (as well as other language) along with charts, graphs and take notes with Jupyter.

Jupyter is a 'Notebook' that can take notes and run code.
This presentation will include:

- execute code step by step while viewing and saving result
- use code cell to run code and visualize data with graph and charts
- use markdown cell to create notes
- share notebook with others in many ways

## 0.2 1. Jupyter Notebook Built-in Commands

### 0.2.1 i. Use Jupyter as a terminal

```
In [ ]: pwd
```

```
In [ ]: ls
```

### 0.2.2 ii View and run *.py file in Jupyter

Use

```
$ %pycat example.py
```

to view local *.py file.
Use

```
$ %run example.py
```

to run local *.py file.

```
In [ ]: %pycat add_example.py
```

```
In [ ]: %run add_example.py
```

### 0.2.3 iii. Jupyter can write Python code into file

Use

```
$ %writefile example.py
```

to write code or text into a file.

```
In [ ]: ls
```

```
In [ ]: %%writefile test.py
        #encoding utf-8
        import datetime

        def print_time():
            print 'the time is:'
            print datetime.datetime.now()

        print_time()
```

```
In [ ]: %pycat test.py
```

### 0.2.4 iv. load .py file into Jupyter

Use

```
$ %load example.py
```

to load python file code into Jupyter

```
In [ ]: %load test.py
```

### 0.2.5 v. Record the run time of the code

Use %%time to record time execution of a Python statement or expression.

```
In [ ]: %%time
        import time
        sum=0
        for x in range(100):
            sum+=x
            time.sleep(0.01)
        print sum
```

Use %%timeit to record average time execution of a Python statement or expression

```
In [ ]: %%timeit
        import time
        sum=0
        for x in range(100):
            sum+=x
```

## 0.3 2. Use code cell to help visualize data

Use matplotlib, pandas and other libraries with Jupyter to help visulaize data

### 0.3.1 i. Run simple Python code

```
In [ ]: 1+2
```

```
In [ ]: def add_1(x,y):
            return x+y+1
        add_1(2,3)
        print_time()
```

### 0.3.2 ii. Use matplotlib to draw graph of data

Add

```
%matplotlib inline
```

to plot graph inside Jupyter

```
In [ ]: %matplotlib inline
        import matplotlib.pyplot as plt
        import numpy as np

        Fs = 200
        f = 2
        sample = 200
        x = np.arange(sample)
        y = np.sin(2 * np.pi * f * x / Fs)
        plt.plot(x, y)
```

Seaborn is a plotting library for Python that uses matplotlib underneath the hood. It provides for a number of plotting types that don't exist in matplotlib.

*The example used below is from here*

```
In [ ]: %matplotlib inline
        import numpy as np
        from scipy.stats import kendalltau
        import seaborn as sns

        rs = np.random.RandomState(20)
        x = rs.normal(size=1000)
        y = -.5 * x + rs.normal(size=1000)

        ax = sns.jointplot(x, y, kind="hex")
```

#### 0.3.3 iii. Use pandas to show the results of data frame

```
In [ ]: import numpy as np
        import pandas

        def get_df():
            data_frame = pandas.read_csv('data-text.csv', sep=',')
            return data_frame

        get_df()
```

### 0.4 3. Use markdown cell to keep notes

There is a example of a markdown below.

# 1 A First Level Headline

Use *word* to show *Italic*
Use **word** to show **bold**.
Itemized lists look like:

- this one
- that one

Here's a numbered list:

1. first item
2. second item
3. third item

## 1.1 A Second Level Headline

You can add code block into the cell like this:
This is a python code block

```
import time
# Quick, count from 0 to 9!
for i in range(10):
    # wait for a while
    time.sleep(0.5)
    print i
```

This is a C++ code block

```
#include<iostream>
usig namespace std;
int main(){
cout<<"Hello World!"<<endl;
}
```

### 1.1.1 A Third Level Headline

Here's a link to a website, to a local file.

Inline math equations go in like so: $\int_0^{+\infty} x^2 dx$. Display math should get its own line and be put in in double-dollarsigns:

$$\int_0^{+\infty} x^2 dx$$

Images can also be added into markdown cell

*Markdown example used from here with some edits*

### 1.1.2 i. Basic Text edit

# 2 A First Level Headline

Use *word* to show *Italic*

Use **word** to show **bold**.

Itemized lists look like:

- this one
- that one

Here's a numbered list:

1. first item
2. second item
3. third item

### 2.0.1 ii. Code Block

Code block can be highlighted according to the language

This is a python code block

```
import time
# Quick, count from 0 to 9!
for i in range(10):
    # wait for a while
    time.sleep(0.5)
    print i
```

This is a C++ code block

```
#include<iostream>
usig namespace std;
int main(){
cout<<"Hello World!"<<endl;
}
```