python

Python一天學會

吳佳諺 老師

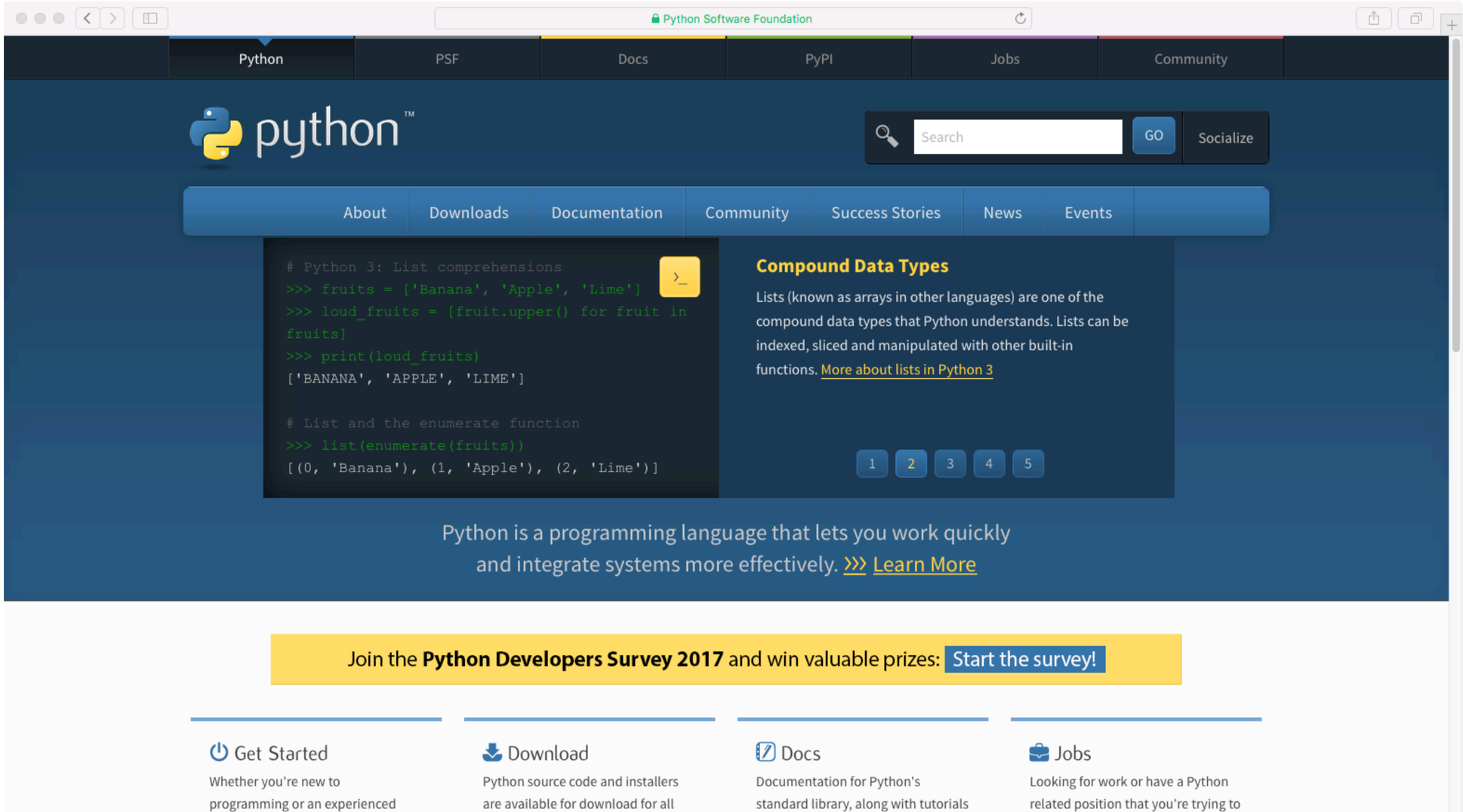
1.下載及安裝Python軟體
2.Python直譯器與計算機
3.資料結構
4.控制結構
5.函數
6.類別
7.繼承
8.異常或錯誤處理
9.使用matplotlib畫圖

1.下載及安裝Python軟體

到python.org下載軟體

到Aanconda下載Python組合

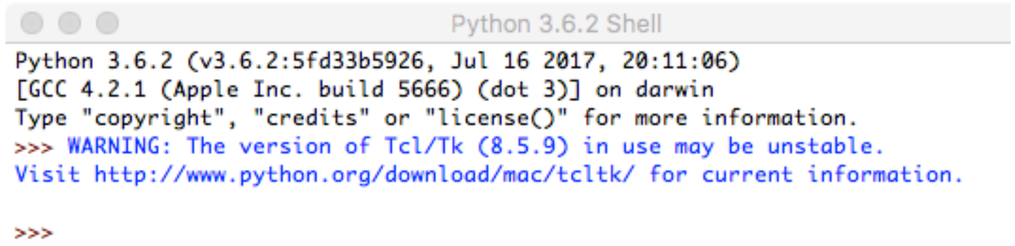
到python.org下載軟體



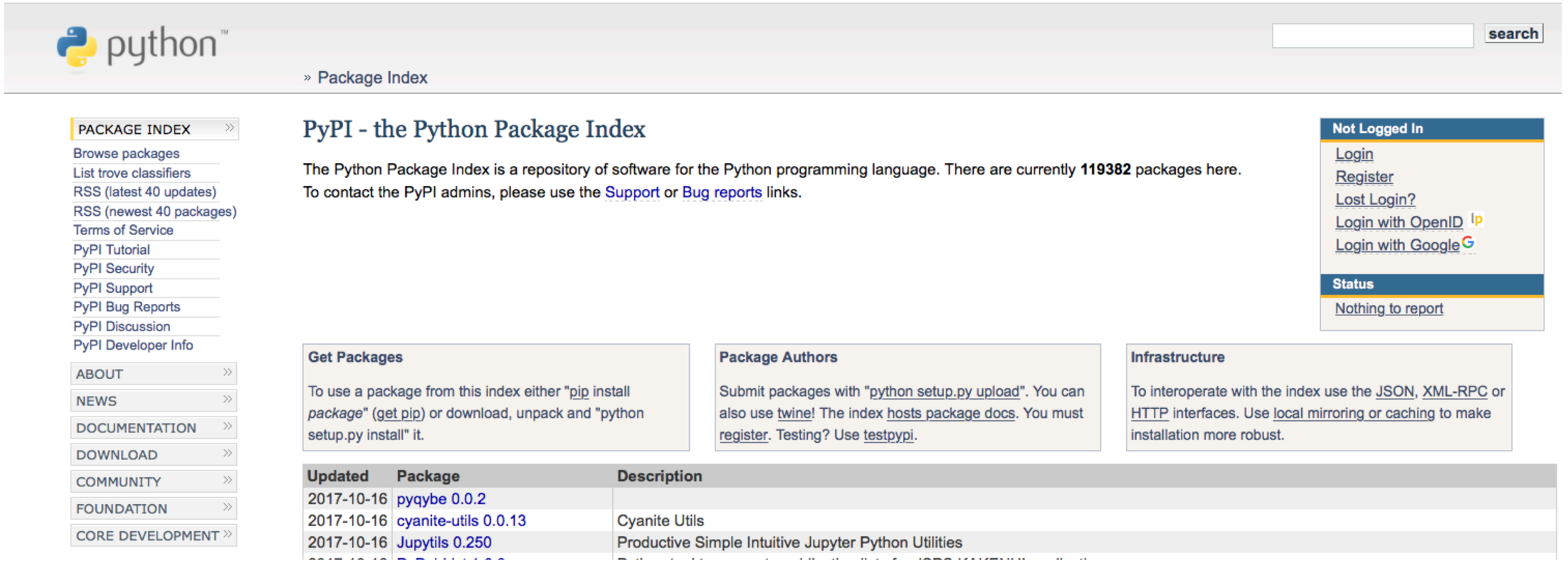
Python安裝

- 這是在Mac上安裝完的Python Launcher

這是安裝完Python的直譯環境



到pypi.python.org下載
easy_install程式並且安裝



使用easy_install安裝pip套件

- easy_install 套件名稱
- 安裝pip
- easy_install install pip

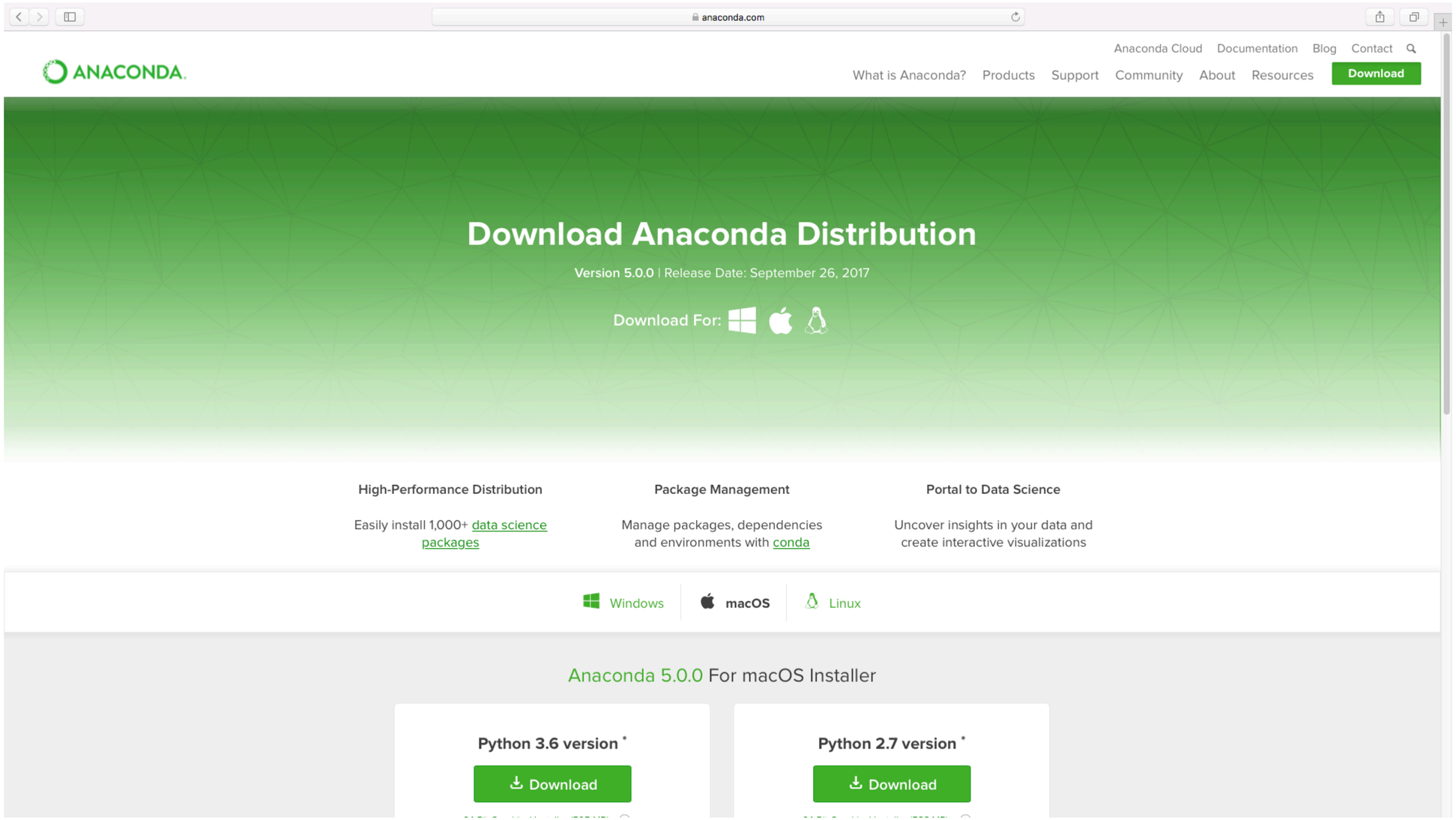
使用pip install 套件名稱

- 安裝套件
- pip install 套件名稱
- 解除安裝套件
- pip uninstall 套件名稱
- 檢視目前系統已經安裝的套件
- pip list

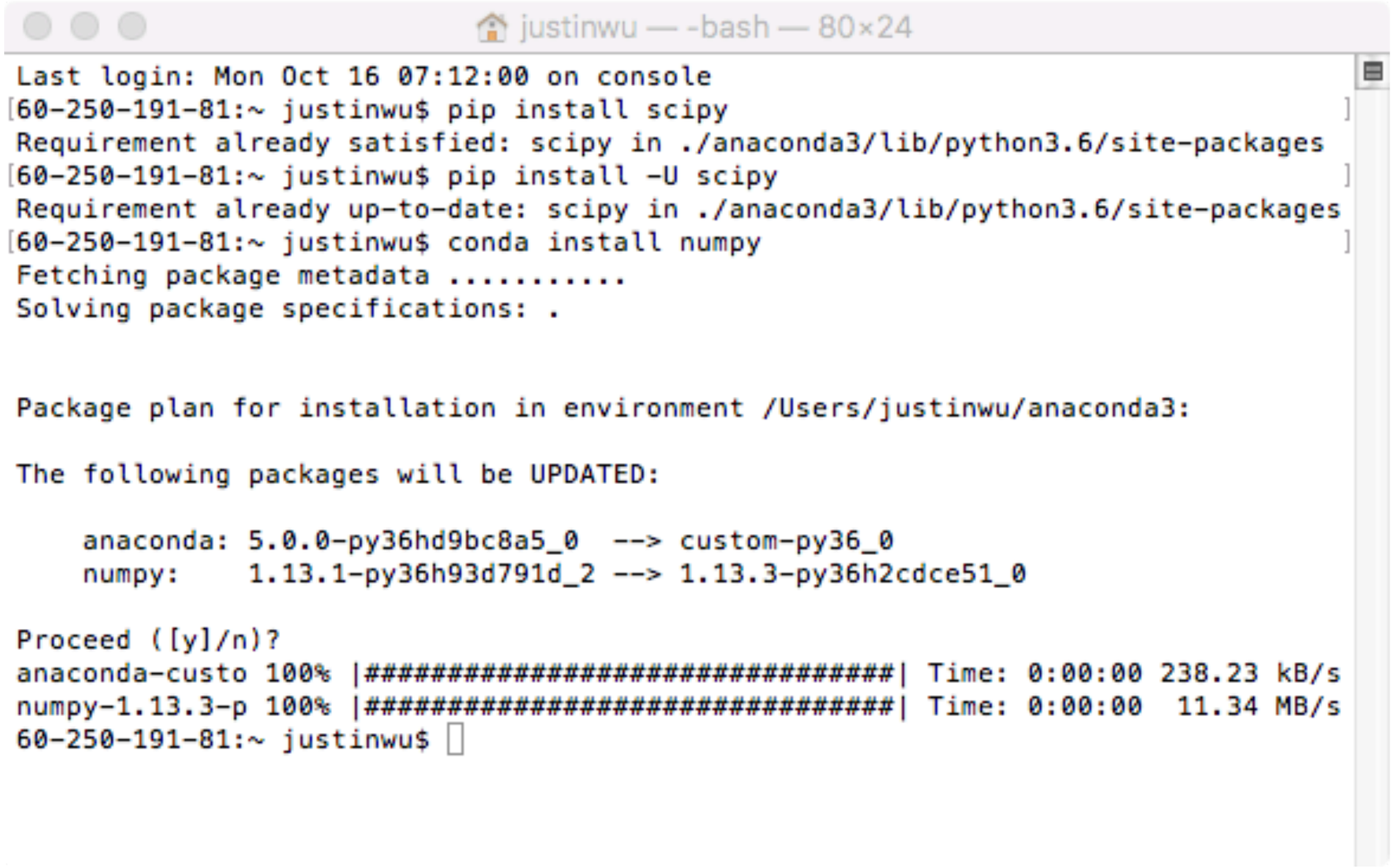
安裝
Anaconda,Numpy,Matplotilib

- 安裝Anaconda組合包
- 此包含Python,spyder,和科學大數據計算軟體
- 安裝Numpy,Matplotilib,Scipy

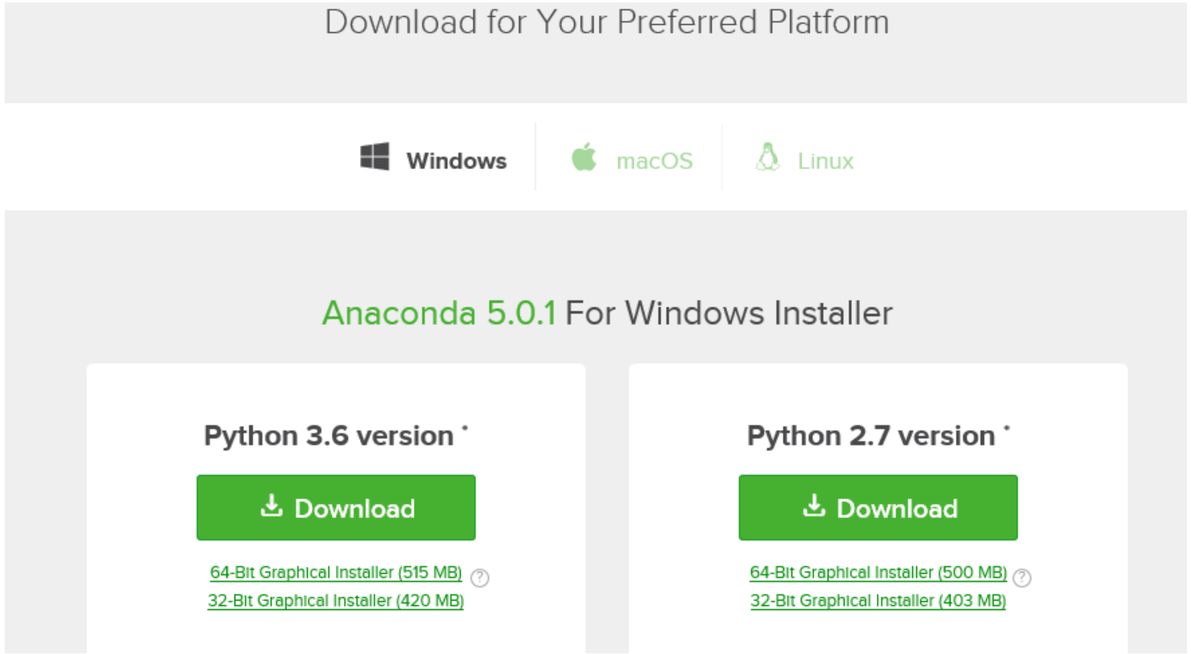
- 到Anconda下載Python組合包https://www.anaconda.com/



使用conda升級套件

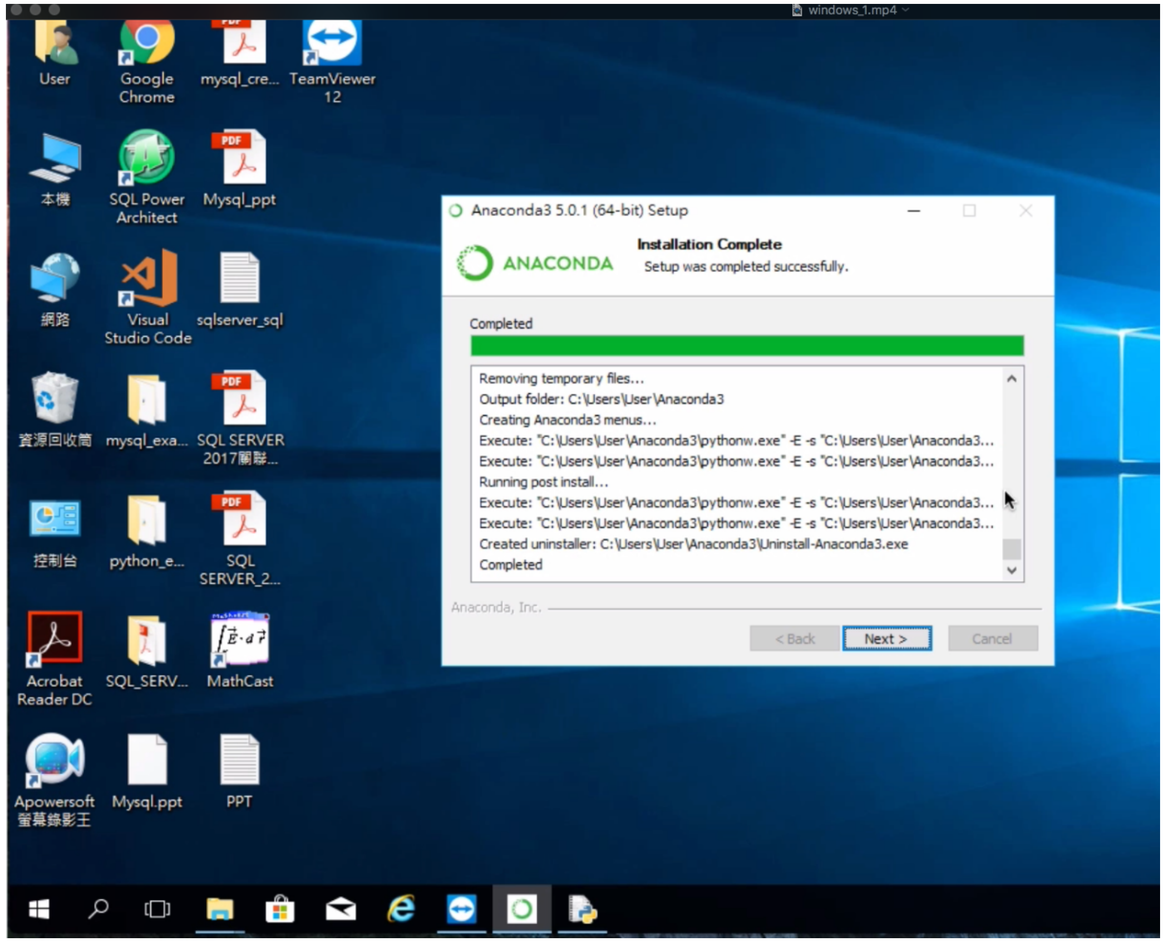


在Windows上安装



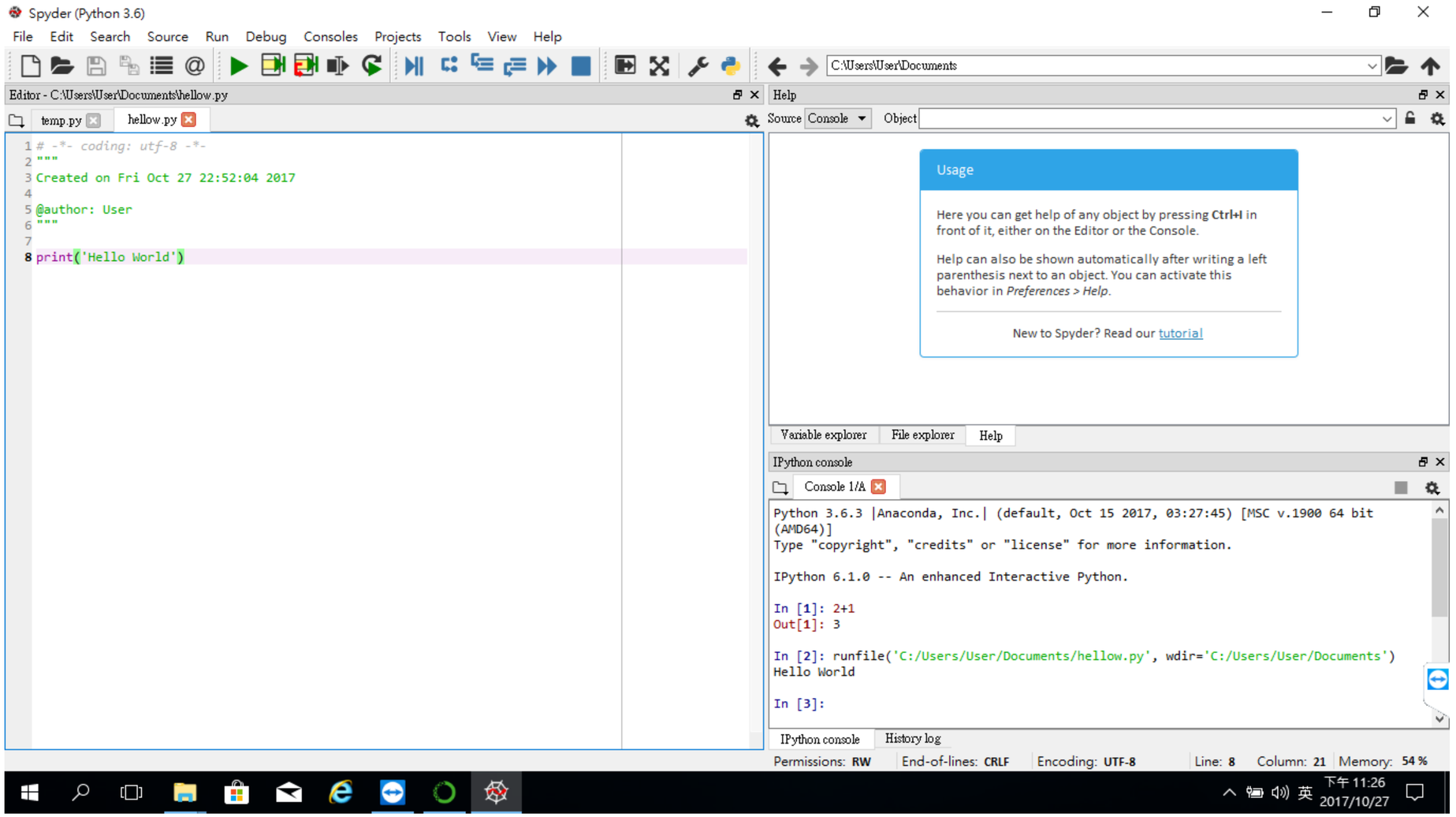
下載並且安裝Anaconda

安裝軟體Anaconda



選取Anaconda Navigator和Spider

執行Spider


Spyder (Python 3.6)
File Edit Search Source Run Debug Consoles Projects Tools View Help
C:\Users\User\Documents
Editor - C:\Users\User\Documents\hellow.py
temp.py
hellow.py
1 # -*- coding: utf-8 -*-
2 """
3 Created on Fri Oct 27 22:52:04 2017
4
5 @author: User
6 """
7
8 print('Hello World')
Help
Source Console Object
Usage
Here you can get help of any object by pressing Ctrl+I in front of it, either on the Editor or the Console.
Help can also be shown automatically after writing a left parenthesis next to an object. You can activate this behavior in Preferences > Help.
New to Spyder? Read our tutorial
Variable explorer File explorer Help
IPython console
Console 1/A
Python 3.6.3 |Anaconda, Inc.| (default, Oct 15 2017, 03:27:45) [MSC v.1900 64 bit (AMD64)]
Type "copyright", "credits" or "license" for more information.
IPython 6.1.0 -- An enhanced Interactive Python.
In [1]: 2+1
Out[1]: 3
In [2]: runfile('C:/Users/User/Documents/hellow.py', wdir='C:/Users/User/Documents')
Hello World
In [3]:
IPython console History log
Permissions: RW End-of-lines: CRLF Encoding: UTF-8 Line: 8 Column: 21 Memory: 54 %
下午 11:26
2017/10/27

2.Python直譯器與計算機

- Mac電腦/usr/local/bin
- Windows電腦C:\python36
- set path=%path%;C:\python36

輸入python執行

```
$ python
Python 3.6.2 |Anaconda, Inc.| (default,
Sep 21 2017, 18:29:43)
[GCC 4.2.1 Compatible Clang 4.0.1 (tags/
RELEASE_401/final)] on darwin
Type "help", "copyright", "credits" or
"license" for more information.
>>>
```

UTF-8編碼

```
# -*- coding: encoding -*-
這是設定utf-8-*-編碼
#-*- coding: utf-8 -*-
```

註解

- #是註解符號

python計算機

```
>>> 1+2
3
>>> 2-1
1
>>> 3*2
6
>>> 3/2
1.5
>>> 3%2
1
>>> 50-5/6
49.166666666666664
>>> (50-5*6)/4
5.0
>>> 5**2
25
>>> 2**5
32
>>>
```

3.資料結構

- 變數
- 運算式與運算子
- 串列
- 堆疊
- 佇列

變數

- 資料型態
  - 整數
  - 浮點數
  - 字串

```python
#!/usr/bin/env python3
#_*_coding:utf-8_*_
"""
Created on Thu Oct 26 07:40:42 2017

@author: justinwu
"""
#這是註解

#這是註解
1+2
#print(1+2)
x=2-1
print(x)
y=3+2
print(y)
z=3.2*2
print(z)
str='大家好'
print(str)
str2='Python'
mychar=str[0]
print(mychar)
```

Name	Type	Size	
mychar	str	1	大
str	str	1	大家好
str2	str	1	Python
x	int	1	1
y	int	1	5
z	float	1	6.4

Console 1/A

```
In [28]: runfile('/Users/ju
wdir='/Users/justinwu/Deskt
1
5
6.4
大家好
大

In [29]:
```

運算式與運算子

- 運算式是由運算子與運算元組成
- +加-減*乘/除是運算子,先乘除後加減的結合優先順序
- 運算元是變數,數字,字串和資料結構
- =是分配符號,將右邊的值分配給左邊變數

```python
#!/usr/bin/env python3
#_*_coding:utf-8_*_
"""
Created on Thu Oct 26 07:40:42 2017

@author: justinwu
"""
#這是註解

#這是註解
1+2
#print(1+2)
x=2-1
print(x)
y=3+2
print(y)
z=3.2*2
print(z)
str='大家好'
print(str)

```

Name	Type	Size	
str	str	1	大家好
x	int	1	1
y	int	1	5
z	float	1	6.4

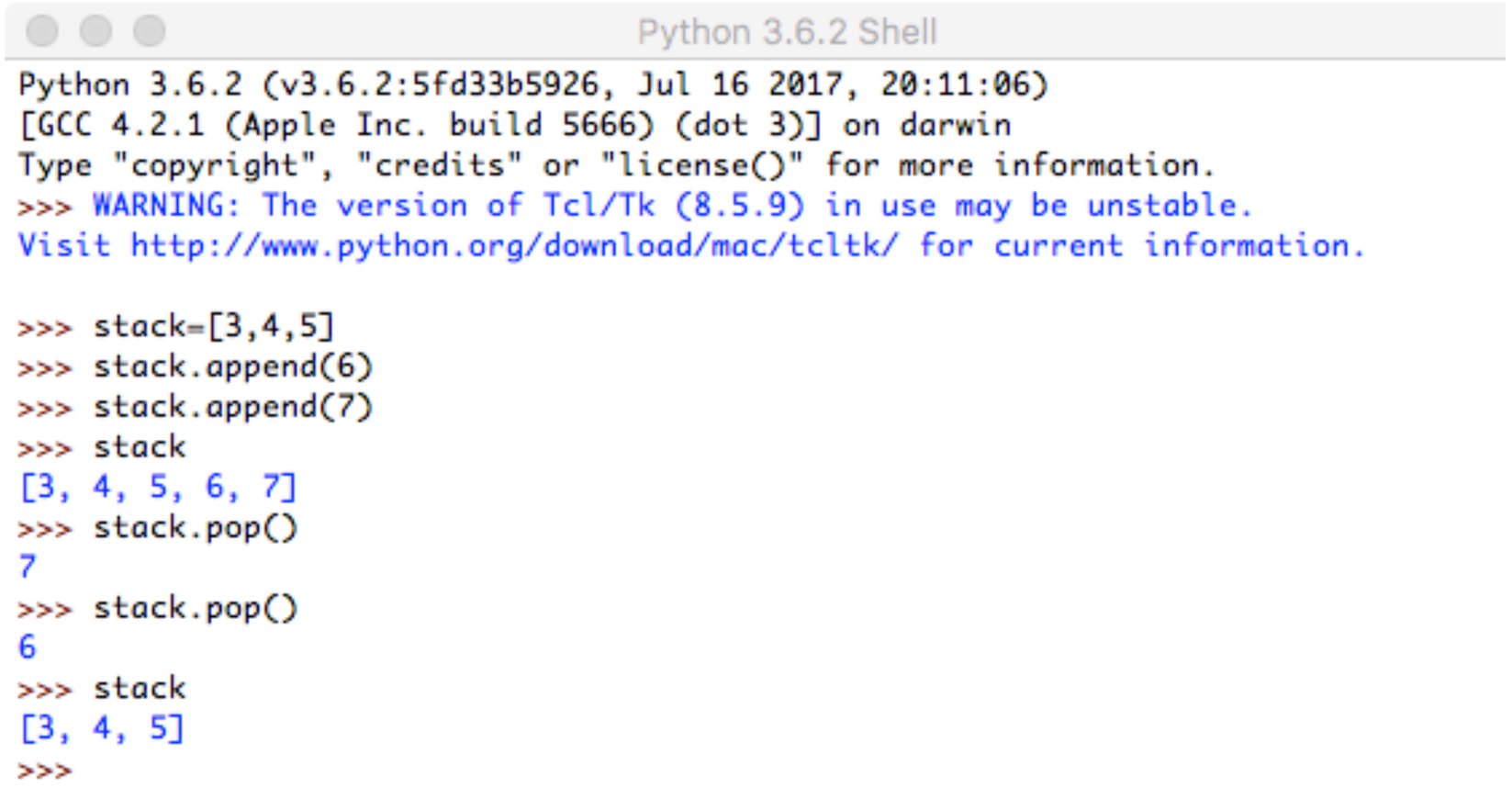
Console 1/A

```
In [22]: runfile('/Users/j
wdir='/Users/justinwu/Desk
1
5
6.4
大家好

In [23]:
```

串列

```
>>> fruits = ['orange','apple','pear','banana','kiwi','apple','banana']
>>> fruits.count('apple')
2
>>> fruits.index('banana')
3
>>> fruits.index('banana',4)#Finding next banana starting a position 4
6
>>> fruits.reverse()
>>> fruits
['banana', 'apple', 'kiwi', 'banana', 'pear', 'apple', 'orange']
>>> fruits.append('grape')
>>> fruits
['banana', 'apple', 'kiwi', 'banana', 'pear', 'apple', 'orange', 'grape']
>>> fruits.sort()
>>> fruits
['apple', 'apple', 'banana', 'banana', 'grape', 'kiwi', 'orange', 'pear']
>>> fruits.pop()
'pear'
>>>
```

堆疊


Python 3.6.2 Shell
Python 3.6.2 (v3.6.2:5fd33b5926, Jul 16 2017, 20:11:06)
[GCC 4.2.1 (Apple Inc. build 5666) (dot 3)] on darwin
Type "copyright", "credits" or "license()" for more information.
>>> WARNING: The version of Tcl/Tk (8.5.9) in use may be unstable.
Visit http://www.python.org/download/mac/tcltk/ for current information.
>>> stack=[3,4,5]
>>> stack.append(6)
>>> stack.append(7)
>>> stack
[3, 4, 5, 6, 7]
>>> stack.pop()
7
>>> stack.pop()
6
>>> stack
[3, 4, 5]
>>>

佇列

```
 8
 9 from collections import deque
10 queue = deque(['阿呆','Eric','John','Michael','小寶','小文'])
11 queue.append("Terry")
12 queue.append("Graham")
13 print(queue.popleft())
14 print(queue.popleft())
15 print(queue)
16
```

```
In [1]: runfile('/Users/justinwu/Desktop/queue.py', wdir='/Us
阿呆
Eric
deque(['John', 'Michael', '小寶', '小文', 'Terry', 'Graham'])

In [2]:
```

數組tuple,集合set和字典

- 可以用數組tuple來儲存固定的元素,使用小括號()來建立一數組tuple
- 集合的元素放置沒有按照順序,可以使用{}大括號來建立一集合Set
- 集合加上索引就是字典{索引:值}

Tuple數組

- 也可以從字串中建立數組
- tp5 = tuple(‘Ivy Lin’)
- 從數組得到串列
- list1 = list(tp5)

```python

tp1=()
print(tp1)
tp2=(1,2,3,4,5,6,7,8)
print(tp2)
print(sum(tp2))
print('--------------------')
print(tp2[2:5])#切割運算子
print(tp2[-1])
tp3 =tuple([2*x for x in range(1,8)])
print(tp3)
print('----------------')
tp4=tuple('Ivy Lin')
print(tp4)
tp5=("John",'小寶','小文')
print(tp5)
print(len(tp5))
print(tp4+tp5)
print('--------------')
tp6=tuple([1,2,3,4,5,6,7,8,9])
print(tp6)
print(max(tp6))
print(min(tp6))

```

```
In [6]: runfile('/Users/justinwu/Desktop/tuple.py', wdir='
Desktop')
()
(1, 2, 3, 4, 5, 6, 7, 8)
36
--------------------
(3, 4, 5)
8
(2, 4, 6, 8, 10, 12, 14)
----------------
('I', 'v', 'y', ' ', 'L', 'i', 'n')
('John', '小寶', '小文')
3
('I', 'v', 'y', ' ', 'L', 'i', 'n', 'John', '小寶', '小文')
--------------
(1, 2, 3, 4, 5, 6, 7, 8, 9)
9
1

In [7]:
```

```
 8
 9 tp6=tuple([66,22,3,46,5,65,7,83,19])
10 print(tp6)
11 list1 = list(tp6)
12 list1.sort()#排序串列
13 print(list1)
14 print('-----------')
15 tp8=tuple(list1)
16 tp9=tuple(list1)
17 print(tp8)
18 print(tp8 == tp9)#比較兩個數組tuple
19
20
21
```

```
In [15]: runfile('/Users/justinwu/
Desktop')
(66, 22, 3, 46, 5, 65, 7, 83, 19)
[3, 5, 7, 19, 22, 46, 65, 66, 83]
-----------
(3, 5, 7, 19, 22, 46, 65, 66, 83)
True

In [16]:
```

Set集合

- 集合(set)用來儲存沒有重複的元素.
- 集合的元素是不可以複製的,元素放置也沒有按照順序
- 可以使用{}大括號來建立一集合Set

Set集合

```
 8
 9 st1=set()#建立一個空集合
10 st2=set([1,2,3,4,5])
11 print(st2)
12 st3={'a','b','c','d','e'}
13 print(st3)
14 print('--------------------')
15 st3.add('f')
16 print(st3)
17 st3.remove('d')
18 print(st3)
19 print('----------')
20 print(st3.union(st2))
21 st5={'a','b','c','d','e'}
22 print(st3.intersection(st5))
23 print(st3.difference(st5))
```

```
In [30]: runfile('/Users/justinwu/Deskto
Desktop')
{1, 2, 3, 4, 5}
{'d', 'a', 'e', 'c', 'b'}
--------------------
{'d', 'f', 'a', 'e', 'c', 'b'}
{'f', 'a', 'e', 'c', 'b'}
----------
{1, 2, 3, 4, 5, 'f', 'a', 'e', 'c', 'b'}
{'b', 'a', 'c', 'e'}
{'f'}

In [31]:
```

字典

- 集合加上索引就是字典{索引:值}

```python
#!/usr/bin/env python3
# -*- coding: utf-8 -*-
"""
Created on Fri Oct 27 19:40:39 2017

@author: justinwu
"""
tel={'Justin':'0920909872','Ivy':'0922876895'}
tel['Johny']='0920885356'
print(tel)
print(tel['Johny'])
del tel['Johny']
tel['Mary']='0922865255'
print(tel)
print(list(tel.keys()))
print(sorted(tel.keys()))
print('Ivy' in tel)
print('Johny' in tel)
```

```
In [5]: runfile('/Users/justinwu/Desktop/TOP/python/
example/dictionary_1.py', wdir='/Users/justinwu/Desktop/
TOP/python/example')
{'Justin': '0920909872', 'Ivy': '0922876895', 'Johny':
'0920885356'}
0920885356
{'Justin': '0920909872', 'Ivy': '0922876895', 'Mary':
'0922865255'}
['Justin', 'Ivy', 'Mary']
['Ivy', 'Justin', 'Mary']
True
False

In [6]:
```

4.控制結構

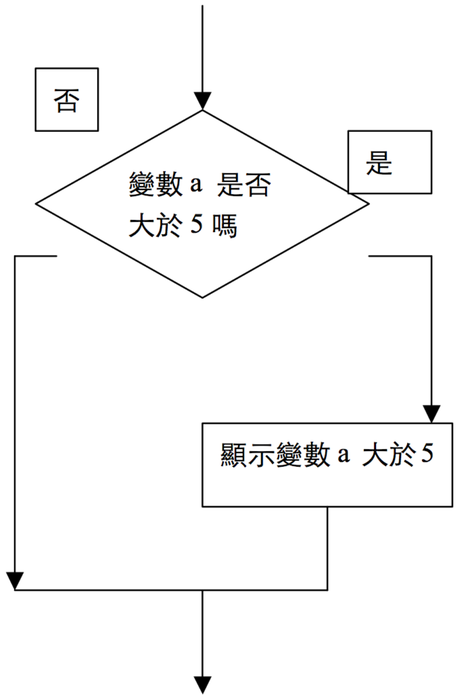
- 選取結構if
- 迴圈結構while,for

選取結構if

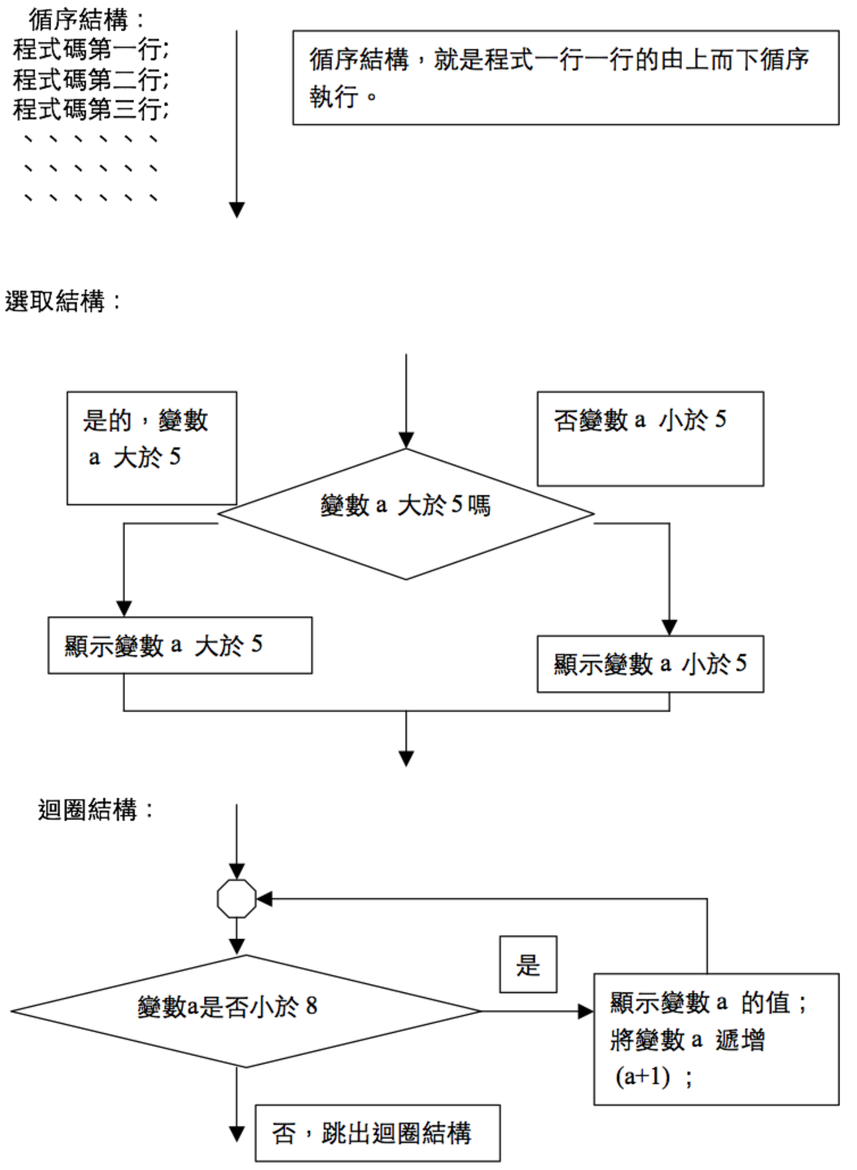
- 語法if:
- if 條件運算式:
- 　　程式敘述1
- else:
- 　　程式敘述2

布林運算式

- 如何來選擇流程前進的方向，我們必須經過測試條件，例如，當條件成立時往左方，當條件不成立時往右方。我們使用布林表示式來測試工作。
- 布林Boolean代數定義在一個二元素的集合上，即B={true,false}，true為真，false為假。我們可以使用這個值的結果來決定我們行進的方向。
- 當下列菱形四邊形成立true時會執行右方的流程，當下列菱形四邊行的條件不成立false時會執行左方的流程。true和false就是屬於布林代數，這是用在if判別式。

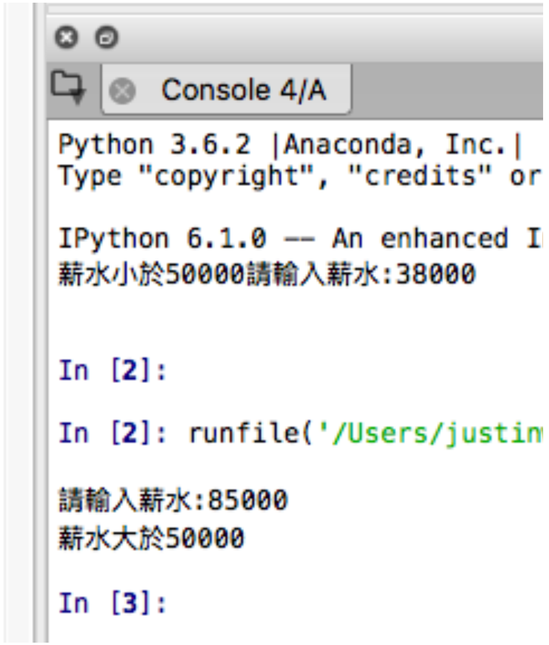


- 當下列菱形四邊形成立true時會執行右方的流程，當下列菱形四邊行的條件不成立false時會執行下方或右方的流程。True和false就是屬於布林代數，這是運用在迴圈結構。



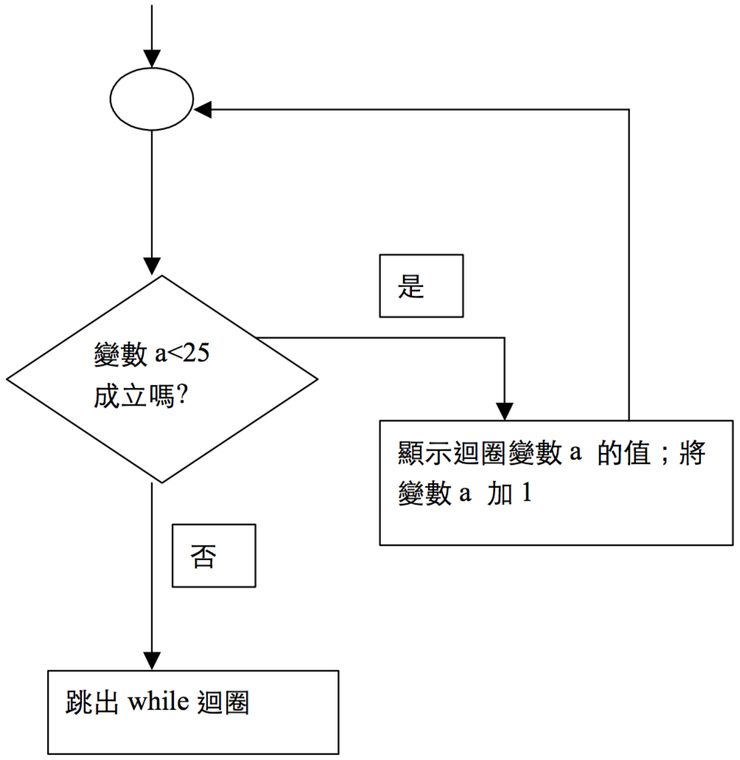
選取結構if

```
8
9  a = int(input("請輸入薪水:"))
10 if a < 50000:
11     print("薪水小於50000")
12 else:
13     print("薪水大於50000")
```



while迴圈

- 在if敘述中，條件後的敘述只執行一次，而在while敘述中，則可執行一次以上。While敘述的程序圖形中.選取結構和循序結構，都只執行程式敘述一次，如果我們要讓同一行程式重複執行好幾遍則要用迴圈敘述。迴圈敘述可以重複執行某一段程式好幾遍，直到條件的不成立才跳出這個迴圈。迴圈敘述：while、do……while。



迴圈結構for,while

迴圈結構for
迴圈結構while

迴圈結構for

- 語法:
- for 計數變數 in range(起始值,終始值):
  - 程式敘述

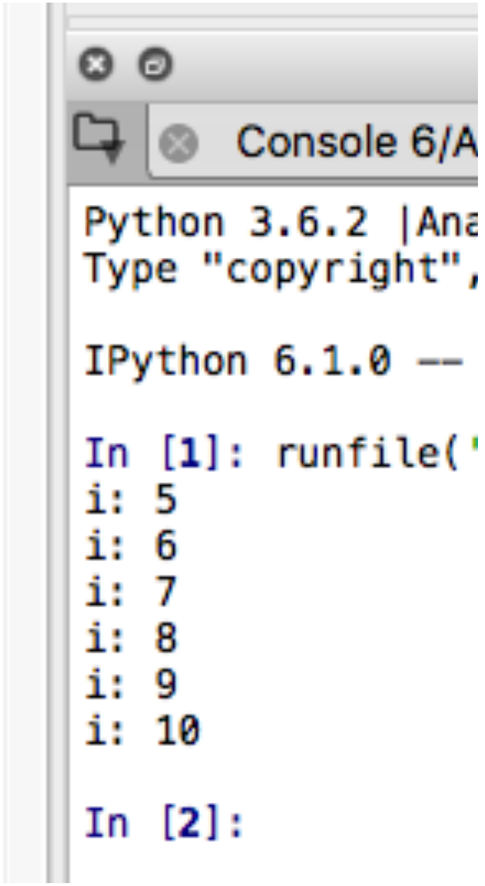
range(8,19)為8到18的數值

```
8
9  for i in range(8,19):
10     print("i的值:",i)
```

```
Console 5/A
Python 3.6.2 |An
Type "copyright"

IPython 6.1.0 --

In [1]: runfile(
i的值: 8
i的值: 9
i的值: 10
i的值: 11
i的值: 12
i的值: 13
i的值: 14
i的值: 15
i的值: 16
i的值: 17
i的值: 18
```

迴圈結構while

```
 8
 9 i=5
10 while i<=10:
11     print("i:",i)
12     i=i+1
```



布林運算式

```python
#!/usr/bin/env python3
# -*- coding: utf-8 -*-
"""
Created on Thu Oct 26 14:30:21 2017

@author: justinwu
"""

x=True
y=False
print(x&y)
print(x|y)
if (x&y):
    print(x&y)
else:
    print(x&y)
z=True
print(z&y)
print(z|y)

```

```
In [30]: runfil
Users/justinwu/
False
True
False
False
True

In [31]:
```

continue繼續執行迴圈

```
1 #!/usr/bin/env python3
2 # -*- coding: utf-8 -*-
3 """
4 Created on Thu Oct 26 14:07:44 2017
5
6 @author: justinwu
7 """
8
9 for i in range(8,19):
10     if(i%2==1):
11         continue
12     print("i的值:",i)
```

```
In [19]: ru
Users/justi
i: 5
i: 6
i: 7
i: 8
i: 9

In [20]:
```

break跳出while迴圈

```
1 #!/usr/bin/env python3
2 # -*- coding: utf-8 -*-
3 """
4 Created on Thu Oct 26 14:09:11 2017
5
6 @author: justinwu
7 """
8
9 i=5
10 x =True
11 while x:
12     print("i:",i)
13     i=i+1
14     if(i>=10):
15         break;
16
```

```
In [19]: runfile('
Users/justinwu/Des
i: 5
i: 6
i: 7
i: 8
i: 9

In [20]:
```

5.函數

```
 8 i = 10
 9 def f():
10     print(i)
11
12 i = 42
13 f()
```

函數與參數

```
14
15 def addf(x,y):
16     print(x+y)
17
18 i1=23
19 i2=12
20 addf(23,12)
21
22
```

return回傳

```
 8 i = 10
 9 def f():
10     print(i)
11
12 i = 42
13 f()
14
15 def addf(x,y):
16     print(x+y)
17
18 i1=23
19 i2=12
20 addf(23,12)
21
22 def myreturn(x,y):
23     return x*y
24
25 i3=2
26 i5=5
27 i8=myreturn(i3,i5)
28 print(i8)
29
30 def myreturn(a,x=2,y=3):
31     return a*x*y
32
33 i3=2
34 i5=5
35 i8=myreturn(8,i3,i5)
36 print(i8)
```

```
Console 2/A
Python 3.6.2 |An
Type "copyright"

IPython 6.1.0 --

In [1]: runfile(
42
35
10
80

In [2]:
```

遞迴函數

```python
#!/usr/bin/env python3
# -*- coding: utf-8 -*-
"""
Created on Thu Oct 26 16:25:09 2017

@author: justinwu
"""

def factorial(n):
    if(n==0):
        return 0
    if(n==1):
        return 1
    else:
        return n*factorial(n-1)

print(factorial(1))
print(factorial(2))
print(factorial(3))
```

```
In [2]: runfile('/Us
wdir='/Users/justinw
1
2
6

In [3]:
```

費式係數

```python
#!/usr/bin/env python3
# -*- coding: utf-8 -*-
"""
Created on Thu Oct 26 16:28:50 2017

@author: justinwu
"""

def fibonaci(n):
    if(n==0):
        return 0
    if(n==1):
        return 1
    else:
        return fibonaci(n-1)+fibonaci(n-2)

print(fibonaci(1))
print(fibonaci(2))
print(fibonaci(3))
print(fibonaci(10))
print(fibonaci(20))

```

```
In [2]: runfile
wdir='/Users/ju
1
2
6

In [3]:
```

python

6.類別


```
 8 class MyClass:
 9     #範例屬性參考
10     i=12345
11
12
13 print(MyClass.i)
14
15
16 class Complex:
17     #實體建構
18     def __init__(self,realpart,imagpart):
19         self.r = realpart
20         self.i = imagpart
21
22 x=Complex(3.0,-4.5)
23 print(x.r,x.i)
24
25
```

成員屬性與成員方法

```
 8
 9 class MyClass2:
10     #範例屬性參考
11     i=12345
12     def f(self):
13         return 'hello world'
14
15 x=MyClass2()
16 print(x.i)
17 print(x.f())
18
19
```

類別和實體變數

- __init__(self,..)為建構函數,實體化物件時會呼叫它
- self為自己這個物件

```
>>> class Dog:
        kind = 'small dog'
        def __init__(self,name):
            self.name = name


>>> d =Dog('small dog')
>>> e = Dog('very small dog')
>>> print(d.kind)
small dog
>>> print(e.kind)
small dog
>>> print(d.name)
small dog
>>> print(e.name)
very small dog
>>>
```

__init__(self)建構物件,
__del__(self)解構物件

```python
#!/usr/bin/env python3
# -*- coding: utf-8 -*-
"""
Created on Fri Oct 27 04:52:38 2017

@author: justinwu
"""

class MyClass:
    i=12345

print(MyClass.i)

class Complex:
    def __init__(self,realpart,imagepart):
        self.r=realpart
        self.i=imagepart
    def __del__(self):
        print('delete object')
x=Complex(3.0,-4.5)
print(x.r,x.i)
x=None
```

```
In [4]: runfile('/
wdir='/Users/justi
12345
3.0 -4.5
delete object

In [5]:
```

7.繼承

- class 子類別(父類別):
- 敘述1
- 敘述2

__為私有存取控制修飾,只有該類別方法才能存取

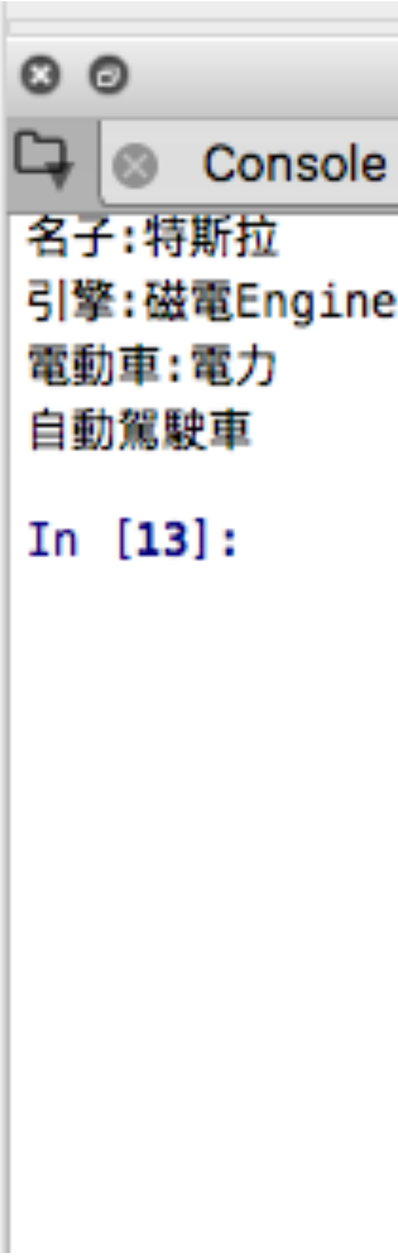
```
7
8  class Vehicle:
9      def __init__(self,name,engine):
10         self.__name = name
11         self.__engine = engine
12
13     def getName(self):
14         return self.__name
15
16     def getEngine(self):
17         return self.__engine
18
19     def setEngine(self,engine):
20         self.__engine = engine
21
22
23 class Car(Vehicle):
24     def __init__(self,name,engine,electric):
25         super().__init__(name,engine)
26         self.__electric = electric
27
28     def getCarName(self):
29         print("名子"+self.getName())
30         print("引擎"+self.getEngine())
31         print("電動車"+self.__electric)
32
33     def getAuto(self):
34         print("自動駕駛車")
35
36 myCar = Car("特斯拉","磁電Engine","電力")
37 myCar.getCarName()
38 print(myCar.getAuto())
```

```
Console 2/A

Python 3.6.2 |Anacon
Type "copyright", "c

IPython 6.1.0 -- An
名子特斯拉
引擎磁電Engine
電動車電力
自動駕駛車
None

In [2]:

In [2]:
```

多重繼承

- class 子類別(父類別1,父類別2,父類別3,..):
- 敘述1
- 敘述2
- 當子類別繼承 (inheritance) 超過一個來源的時候，會以寫在最左邊的父類別優先繼承，多個父類別如果有相同名稱的屬性 (attribute) 與方法 (method) ，就會以最左邊的父類別優先。

```
 8 class Vehicle:
 9     def __init__(self,name,engine):
10         self.__name = name
11         self.__engine = engine
12 
13     def getName(self):
14         return self.__name
15 
16     def getEngine(self):
17         return self.__engine
18 
19     def setEngine(self,engine):
20         self.__engine = engine
21 
22 class Electric:
23     def __init_(self,PowerElectric):
24         self.__PowerElectric = PowerElectric
25 
26     def getPower(self):
27         return self.__PowerElectric
28 
29     def setPower(self,PowerElectric):
30         self.__PowerElectric = PowerElectric
```



```
33
34 class Car(Vehicle,Electric):
35     def __init__(self,name,engine,PowerElectric,auto):
36         super().__init__(name,engine)
37         self.setPower(PowerElectric)
38         self.__Auto = auto
39
40     def getCarName(self):
41         print("名子:"+self.getName())
42         print("引擎:"+self.getEngine())
43         print("電動車:"+self.getPower())
44
45     def getAuto(self):
46         return self.__Auto
47
48
49 myCar = Car("特斯拉","磁電Engine","電力","自動駕駛車")
50 myCar.getCarName()
51 print(myCar.getAuto())
```

多型

子類別和父類別
有同名的
getEngine()名稱

```python
#!/usr/bin/env python3
# -*- coding: utf-8 -*-

class Vehicle:
    def __init__(self,name,engine):
        self.__name=name
        self.__engine=engine

    def getName(self):
        return self.__name
    def getEngine(self):
        return self.__engine

class Car(Vehicle):
    def __init__(self,name,engine,electric):
        super().__init__(name,engine)
        self.__electric=electric

    def getEngine(self):
        return ("超級")

    def getAuto(self):
        print("自動駕駛車")

myCar=Car("特斯拉","磁電Engine","電力")
myCar.getAuto()
print(myCar.getEngine())
```

```
In [17]: r
car_in.py'
自動駕駛車
超級

In [18]:
```

8.異常或錯誤處理

```
>>> while True:
        try:
            x = int(input("Please enter a number: "))
            break
        except ValueError:
            print("input error")
```

```
Please enter a number: f
input error
Please enter a number: f
input error
Please enter a number: ffffff
input error
Please enter a number:
```

異常或錯誤處理

```python
import sys
try:
    #f = open('myle.txt')
    f = open('mysql.py')
    s = f.readline()
    i = int(s.strip())
except OSError as err:
    print("OS error: {0}".format(err))
except ValueError:
    print("Could not convert data to an integer.")
except:
    print("Unexpected error:", sys.exc_info()[0])

```

Name	Type	Size	
s	str	1	#!/usr/bin/python

Variable explorer | File ex

IPython con

Console 1/A

```
In [5]:

In [5]: runfile('/Users/justinwu/Desktop/exception.py', wdi
OS error: [Errno 2] No such file or directory: 'myle.txt'

In [6]: runfile('/Users/justinwu/Desktop/exception.py', wdi
Could not convert data to an integer.

In [7]:
```

使用raise關鍵字丟出例外

```
 8
 9 import sys
10
11 def displaySalary(salary):
12     if salary<0:
13         raise ValueError("薪水為正")
14     print("薪水="+str(salary))
15
16 try:
17     #f = open('myle.txt')
18     Salary = eval(input("請輸入薪水:"))
19     displaySalary(Salary)
20 except OSError as err:
21     print("OS error: {0}".format(err))
22 except ValueError:
23     print("錯誤:輸入薪水值為正")
24 except:
25     print("Unexpected error:", sys.exc_info()[0])
```

```
Console 2/A
Unexpected error: <class 'SyntaxError'>

In [14]: runfile('/Users/justinwu/Deskto

請輸入薪水:80000
薪水=80000

In [15]: runfile('/Users/justinwu/Deskto

請輸入薪水:x
Unexpected error: <class 'NameError'>

In [16]: runfile('/Users/justinwu/Deskto

請輸入薪水:-10000
錯誤:

In [17]: runfile('/Users/justinwu/Deskto

請輸入薪水:-10000
錯誤:輸入薪水值為正
```

檔案處理

- fp=open(‘檔案名稱’,’檔案開啟模式’)

模式字串	當開啟檔案已存在	當開啟檔案不存在
r	開啟唯獨的檔案	產生異常錯誤
w	清除檔案內容後寫入	建立寫入檔案
a	開啟檔案從檔尾後開始寫入	建立寫入檔案
r+	開啟讀寫的檔案	產生錯誤
w+	清除檔案內容後讀寫內容	建立讀寫檔案
a+	從檔案尾巴開使讀寫	建立讀寫檔案

開啟,關閉及寫入檔案

```python
#!/usr/bin/env python3
# -*- coding: utf-8 -*-
"""
Created on Sat Oct 28 06:39:38 2017

@author: justinwu
"""
fp=open('file.txt','w')
if fp !=None:
    print('檔案開啟成功')
fp.close()

fp=open('file.txt','w')
if fp !=None:
    fp.write("小白")
fp.close()

fp=open('file.txt','w')
if fp !=None:
    fp.write("宇哲")
fp.close()
```

```
In [8]: runfile
Users/justinwu/
檔案開啟成功

In [9]:
```

讀取檔案

```
1 #!/usr/bin/env python3
2 # -*- coding: utf-8 -*-
3 """
4 Created on Sat Oct 28 06:46:03 2017
5
6 @author: justinwu
7 """
8
9 fp=open('file.txt','r')
10 if fp !=None:
11     str=fp.read()
12     print(str)
13 fp.close()
14
15 fp=open('file.txt','r')
16 if fp !=None:
17     strList=fp.readlines()
18     print(strList)
19 fp.close()
```

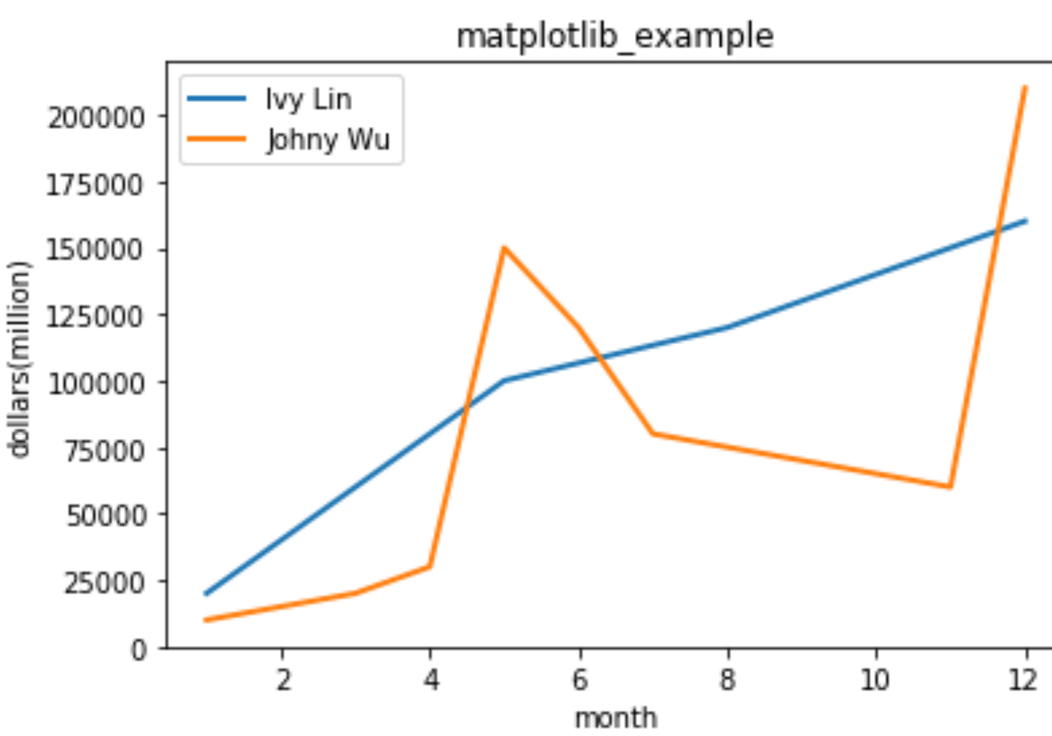
```
In [11]: runfil
Users/justinwu/
宇哲
['宇哲']

In [12]:
```

9.使用matplotlib畫圖

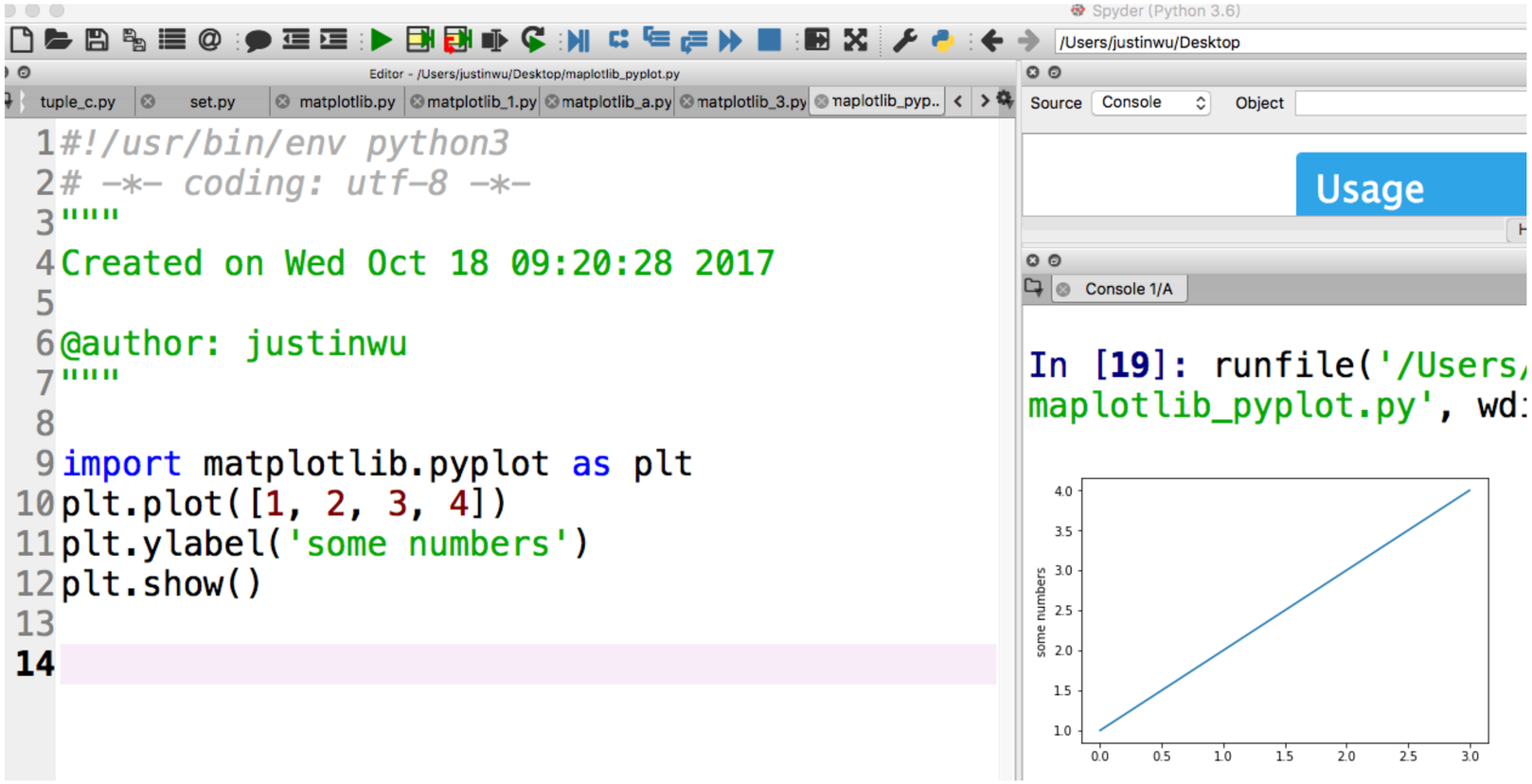
- Matplotlib.pyplot是畫圖的命令集合函數.每一個pyplot函數可以建立或修改圖形

使用matplotlib畫圖

```
@author: justinwu
"""
import matplotlib.pyplot as mpt

month1 = [1,2,3,4,5,8,10,12]
month2 = [1,3,4,5,6,7,11,12]
sales1 = [20000,40000,60000,80000,100000,120000,140000,160000]
sales2 = [10000,20000,30000,150000,120000,80000,60000,210000]

mpt.plot(month1,sales1,lw=2,label='Ivy Lin')
mpt.plot(month2,sales2,lw=2,label='Johny Wu')
mpt.xlabel('month')
mpt.ylabel('dollars(million)')
mpt.legend()
mpt.title('matplotlib_example')
mpt.show()
```



plt.plot([1,2,3,4])預設是X軸,而Y軸是我們輸入的資料串列[1,2,3,4].



第一個[1,2,3,4]參數是X軸,第二個參數是Y軸

Spyder (Python 3.6)

/Users/justinwu/Desktop

Editor - /Users/justinwu/Desktop/matplotlib_a1.py

tuple.py | tuple_c.py | set.py | matplotlib.py | matplotlib_1.py | matplotlib_a1.py | matplotlib_3.py

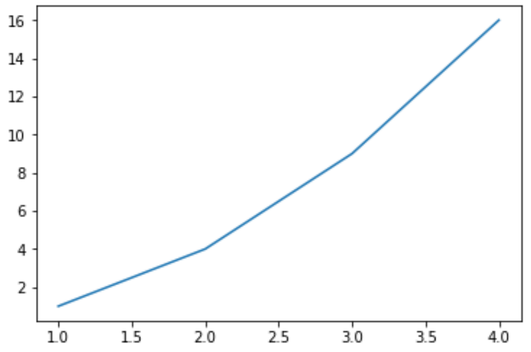
```
1 #!/usr/bin/env python3
2 # -*- coding: utf-8 -*-
3 """
4 Created on Wed Oct 18 08:51:23 2017
5
6 @author: justinwu
7 """
8
9 import matplotlib.pyplot as plt
10
11
12 plt.plot([1, 2, 3, 4], [1, 4, 9, 16])
13 plt.show()
14
```

Source | Console | Object

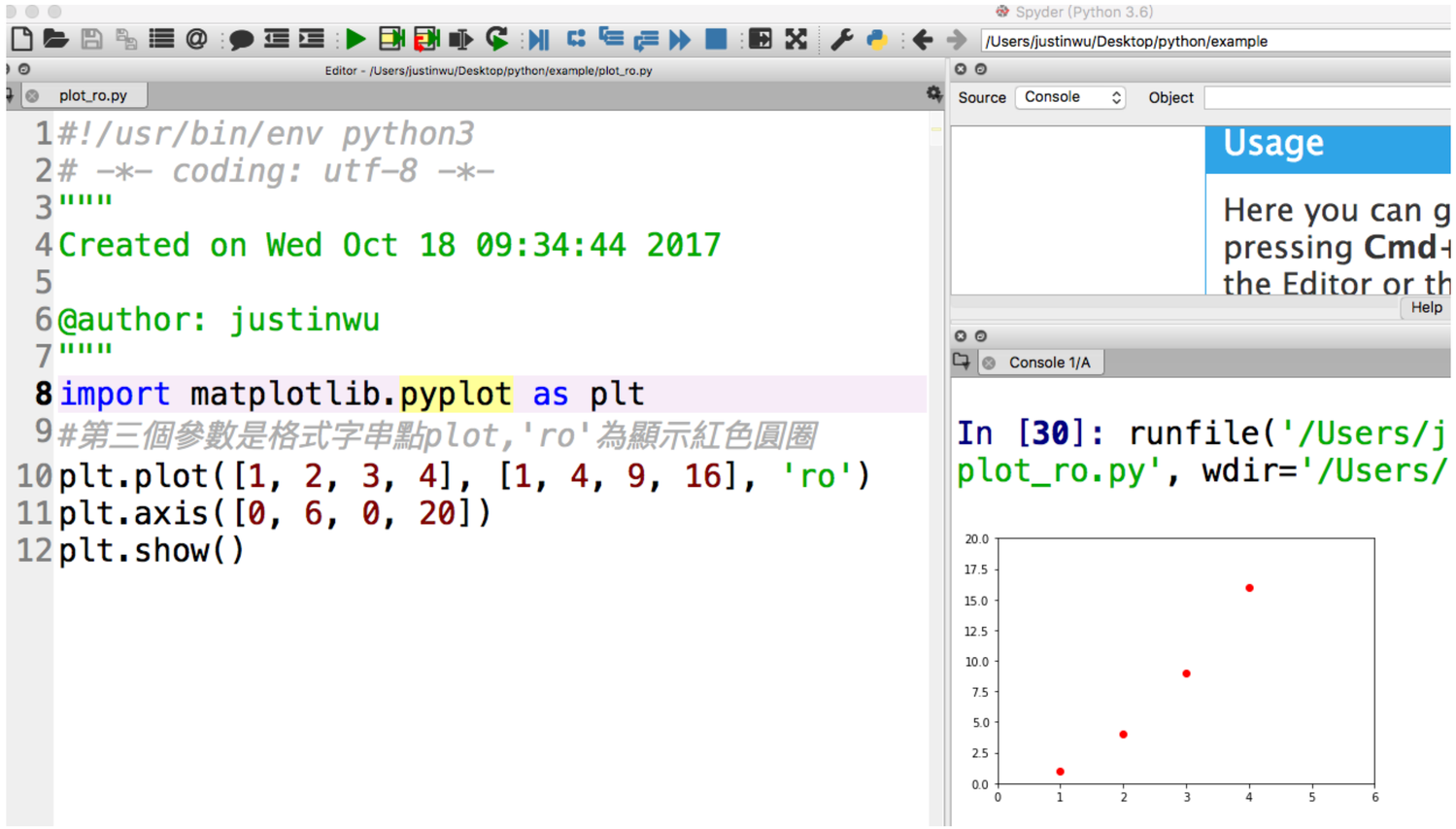
Usage

Console 1/A

```
In [24]: runfile('/Use
wdir='/Users/justinwu/
```



plot()第三個參數是格式字串點
plot,'ro'為顯示紅色圓圈



'r--'紅色虛線,'bs'藍色矩形,'g^'綠色三角形

Spyder (Python 3.6)

/Users/justinwu/Desktop/python/example

Editor - /Users/justinwu/Desktop/python/example/plot_s.py

plot_ro.py | plot_s.py

```
1 #!/usr/bin/env python3
2 # -*- coding: utf-8 -*-
3 """
4 Created on Wed Oct 18 09:42:54 2017
5
6 @author: justinwu
7 """
8
9 import numpy as np
10
11 # 0到5每步0.2
12 t = np.arange(0., 5., 0.2)
13
14 # red dashes, blue squares and green triangles
15 # 'r--'紅色虛線,'bs'藍色矩形,'g^'綠色三角形
16 plt.plot(t, t, 'r--', t, t**2, 'bs', t, t**3,
17 plt.show()
```

Source | Console | Object

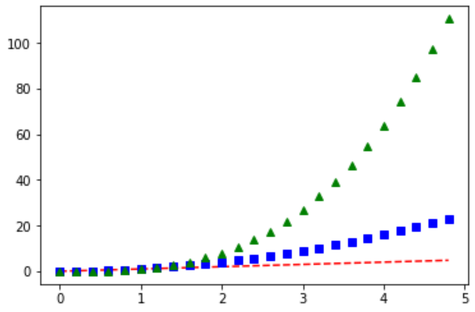
Usage

Here you can g
pressing Cmd+
the Editor or th

Help

Console 1/A

```
In [33]: runfile('/Users/ju
plot_s.py', wdir='/Users/ju
```



- Thanks.