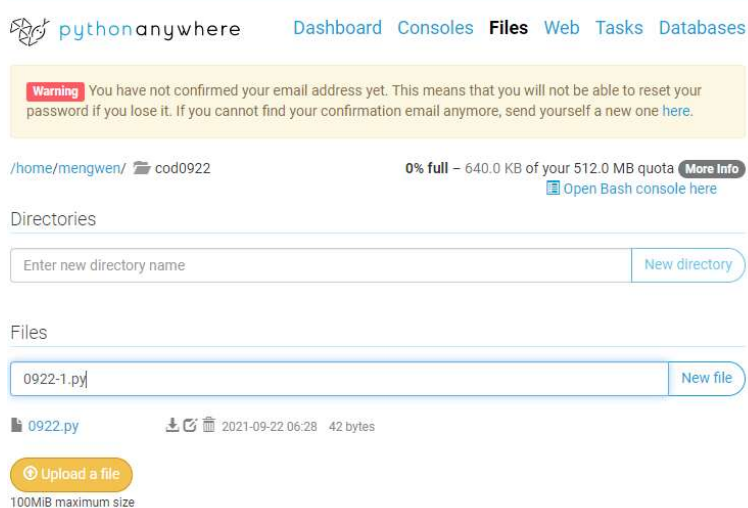


1100922 , (三) 678

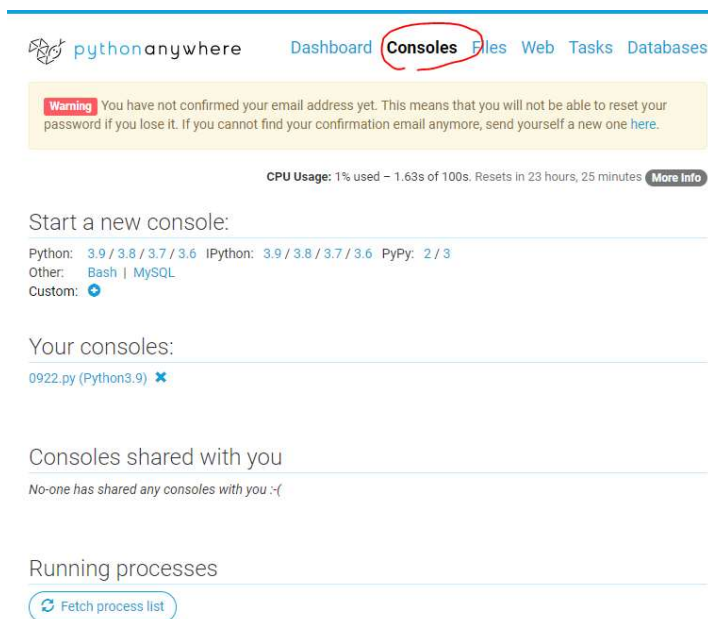
1101-4205AI 思維



The screenshot shows the PythonAnywhere Files dashboard. At the top, there is a navigation bar with 'pythonanywhere', 'Dashboard', 'Consoles', 'Files', 'Web', 'Tasks', and 'Databases'. Below this is a warning message: 'Warning You have not confirmed your email address yet. This means that you will not be able to reset your password if you lose it. If you cannot find your confirmation email anymore, send yourself a new one here.' The current directory is '/home/mengwen/ cod0922' with a quota of 512.0 MB and 640.0 KB used (0% full). There are input fields for 'Enter new directory name' and 'New directory', and 'Files' with an input field for '0922-1.py' and 'New file'. A file '0922.py' is listed with a download icon, a trash icon, and a timestamp '2021-09-22 06:28' and size '42 bytes'. There is an 'Upload a file' button with a '100MiB maximum size' note.

新增一個資料夾『0922』

新增一個程式『0922.py』...新增的一定要加上.py



The screenshot shows the PythonAnywhere Consoles dashboard. The navigation bar has 'Consoles' circled in red. Below the warning message, there is a 'CPU Usage: 1% used - 1.63s of 100s. Resets in 23 hours, 25 minutes' indicator. The 'Start a new console:' section lists options for Python (3.9 / 3.8 / 3.7 / 3.6), IPython (3.9 / 3.8 / 3.7 / 3.6), PyPy (2 / 3), Other (Bash | MySQL), and Custom. The 'Your consoles:' section shows a single console '0922.py (Python3.9)' with a close icon. The 'Consoles shared with you' section shows 'No-one has shared any consoles with you :-('. The 'Running processes' section has a 'Fetch process list' button.

從『Consoles』刪除檔案

學生線上學習...無付費...最多只能 2 個檔案同時存在

其他要先刪除

```
s=0
```

```
for i in range(1,10):
```

```
    print('s1=',s)
```

```
s+=i**2
print('s2=',s)
print(i,2*i,i**2,s)
```

```
S=0; Lx=[]; Ly=[]
for i in range(1,10):
    x=i
    y=x**2
    Lx.append(x)
    Ly.append(y)
    S+=y
    print(x,y,S)
print('Lx=',Lx)
print('Ly=',Ly)

import matplotlib.pyplot as plt
plt.plot(Lx,Ly,'o-')
plt.savefig("square.png")
print ('plot is done')
```

```
1 S=0; Lx=[];Ly=[]
2 for i in range(1,10):
3     x=i
4     y=x**2
5     Lx.append(x)
6     Ly.append(y)
7     S+=y
8     print(x,y,S)
9 print('Lx=',Lx)
10 print('Ly=',Ly)
```

8- print : 空 4 格...8 在迴圈內

9、10-print : 沒空 4 格....迴圈外

9-print : 也空 4 格...9 在迴圈內

比較差異

```

/home/mengwen/cod0922/0922.py Keyboard sho
1 S=0; Lx=[];Ly=[]
2 for i in range(1,10):
3     x=i
4     y=x**2
5     Lx.append(x)
6     Ly.append(y)
7     S+=y
8     print(x,y,S)
9 print('Lx=',Lx)
10 print('Ly=',Ly)

```

```

1 1 1
2 4 5
3 9 14
4 16 30
5 25 55
6 36 91
7 49 140
8 64 204
9 81 285
Lx= [1, 2, 3, 4, 5, 6, 7, 8, 9]
Ly= [1, 4, 9, 16, 25, 36, 49, 64, 81]
>>>

```

```

/home/mengwen/cod0922/0922.py
Keyboard shortcuts: Normal Share Save Save as...
1 S=0; Lx=[];Ly=[]
2 for i in range(1,10):
3     x=i
4     y=x**2
5     Lx.append(x)
6     Ly.append(y)
7     S+=y
8     print(x,y,S)
9     print('Lx=',Lx)
10    print('Ly=',Ly)

```

```

1 1 1
Lx= [1]
2 4 5
Lx= [1, 2]
3 9 14
Lx= [1, 2, 3]
4 16 30
Lx= [1, 2, 3, 4]
5 25 55
Lx= [1, 2, 3, 4, 5]
6 36 91
Lx= [1, 2, 3, 4, 5, 6]
7 49 140
Lx= [1, 2, 3, 4, 5, 6, 7]
8 64 204
Lx= [1, 2, 3, 4, 5, 6, 7, 8]
9 81 285
Lx= [1, 2, 3, 4, 5, 6, 7, 8, 9]
Ly= [1, 4, 9, 16, 25, 36, 49, 64, 81]
>>>

```

迴圈內、迴圈外

```

/home/mengwen/cod0922/0922.py
1 S=0; Lx=[];Ly=[]
2 for i in range(1,10):
3     x=i
4     y=x**2
5     Lx.append(x)
6     Ly.append(y)
7     S+=y
8     print(x,y,S)
9     print('Lx=',Lx)
10    print('Ly=',Ly)
11
12 import matplotlib
13 import matplotlib.pyplot as plt
14 plt.plot(Lx,Ly)
15 plt.savefig("sinx.png")
16 print ('plot is done')

```

按『RUN』，程式跑完後回到資料夾  
會看到畫出來的圖

pythonanywhere Dashboard Consoles Files Web Tasks Databases

**Warning** You have not confirmed your email address yet. This means that you will not be able to reset your password if you lose it. If you cannot find your confirmation email anymore, send yourself a new one [here](#).

/home/mengwen/ cod0922 [Open Bash console here](#) 0% full - 660.0 KB of your 512.0 MB quota [More Info](#)

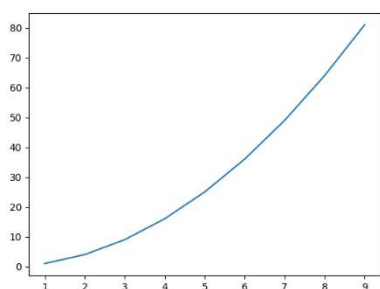
Directories

Files

- 0922-1.py 2021-09-22 06:32 0 bytes
- 0922.py 2021-09-22 06:57 267 bytes
- sinx.png** 2021-09-22 06:57 17.8 KB

100MiB maximum size

下載就可以看到圖



圖：實線+點

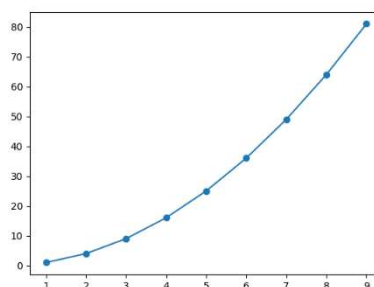


/home/mengwen/cod0922/0922.py

```

1 S=0; Lx=[];Ly=[]
2 for i in range(1,10):
3     x=i
4     y=x**2
5     Lx.append(x)
6     Ly.append(y)
7     S+=y
8     print(x,y,S)
9     print('Lx=',Lx)
10    print('Ly=',Ly)
11
12 import matplotlib
13 import matplotlib.pyplot as plt
14 plt.plot(Lx,Ly,'o-')
15 plt.savefig("sinx.png")
16 print('plot is done')

```



圖：實線紅色

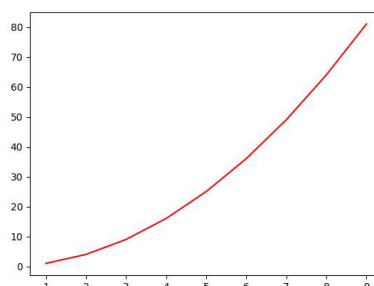


/home/mengwen/cod0922/0922.py

```

1 S=0; Lx=[];Ly=[]
2 for i in range(1,10):
3     x=i
4     y=x**2
5     Lx.append(x)
6     Ly.append(y)
7     S+=y
8     print(x,y,S)
9     print('Lx=',Lx)
10    print('Ly=',Ly)
11
12 import matplotlib
13 import matplotlib.pyplot as plt
14 plt.plot(Lx,Ly,'r-')
15 plt.savefig("sinx.png")
16 print('plot is done')

```



圖：實線紅色+點

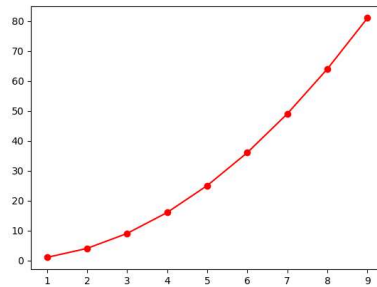


/home/mengwen/cod0922/0922.py

```

1 S=0; Lx=[];Ly=[]
2 for i in range(1,10):
3     x=i
4     y=x**2
5     Lx.append(x)
6     Ly.append(y)
7     S+=y
8     print(x,y,S)
9     print('Lx=',Lx)
10    print('Ly=',Ly)
11
12 import matplotlib
13 import matplotlib.pyplot as plt
14 plt.plot(Lx,Ly,'ro-')
15 plt.savefig("sinx.png")
16 print ('plot is done')

```



圖：虛線紅色+點

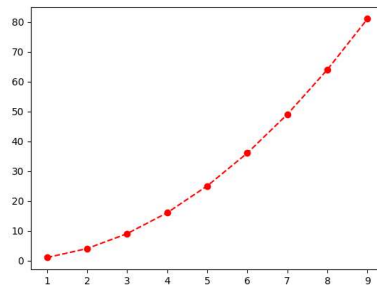


/home/mengwen/cod0922/0922.py

```

1 S=0; Lx=[];Ly=[]
2 for i in range(1,10):
3     x=i
4     y=x**2
5     Lx.append(x)
6     Ly.append(y)
7     S+=y
8     print(x,y,S)
9     print('Lx=',Lx)
10    print('Ly=',Ly)
11
12 import matplotlib
13 import matplotlib.pyplot as plt
14 plt.plot(Lx,Ly,'r--o')
15 plt.savefig("sinx.png")
16 print ('plot is done')

```



圖：虛線綠色

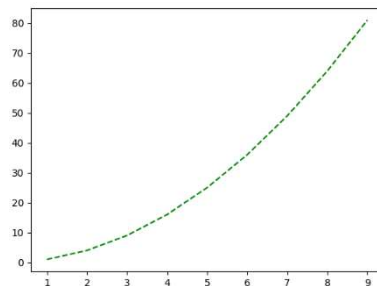


/home/mengwen/cod0922/0922.py

```

1 S=0; Lx=[];Ly=[]
2 for i in range(1,10):
3     x=i
4     y=x**2
5     Lx.append(x)
6     Ly.append(y)
7     S+=y
8     print(x,y,S)
9     print('Lx=',Lx)
10    print('Ly=',Ly)
11
12 import matplotlib
13 import matplotlib.pyplot as plt
14 plt.plot(Lx,Ly,'g-|')
15 plt.savefig("sinx.png")
16 print ('plot is done')

```



Python...會用到很多『import』

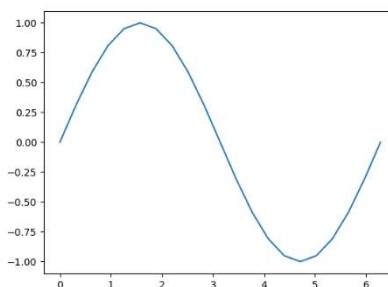
『Import』人家寫好的編碼

```
import math
import matplotlib.pyplot as plt
pi=math.pi
print('pi=',pi)
a=0; b=2*pi; N=20; dx=(b-a)/N
print(a,b,N,dx)
Lx=[]; Ly=[]
for i in range(N+1):
    x=a+dx*i
    y=math.sin(x)
    Lx.append(x)
    Ly.append(y)
    print(i,x,y)
plt.plot(Lx,Ly)
plt.savefig("sinx-1.png")
print('plot is done')
```



/home/mengwen/cod0922/0922-2.py

```
1 import math
2 import matplotlib.pyplot as plt
3 pi=math.pi
4 print('pi=',pi)
5 a=0; b=2*pi; N=20; dx=(b-a)/N
6 print(a,b,N,dx)
7 Lx=[]; Ly=[]
8 for i in range(N+1):
9     x=a+dx*i
10    y=math.sin(x)
11    Lx.append(x)
12    Ly.append(y)
13    print(i,x,y)
14 plt.plot(Lx,Ly)
15 plt.savefig("sinx-1.png")
16 print('plot is done')
```



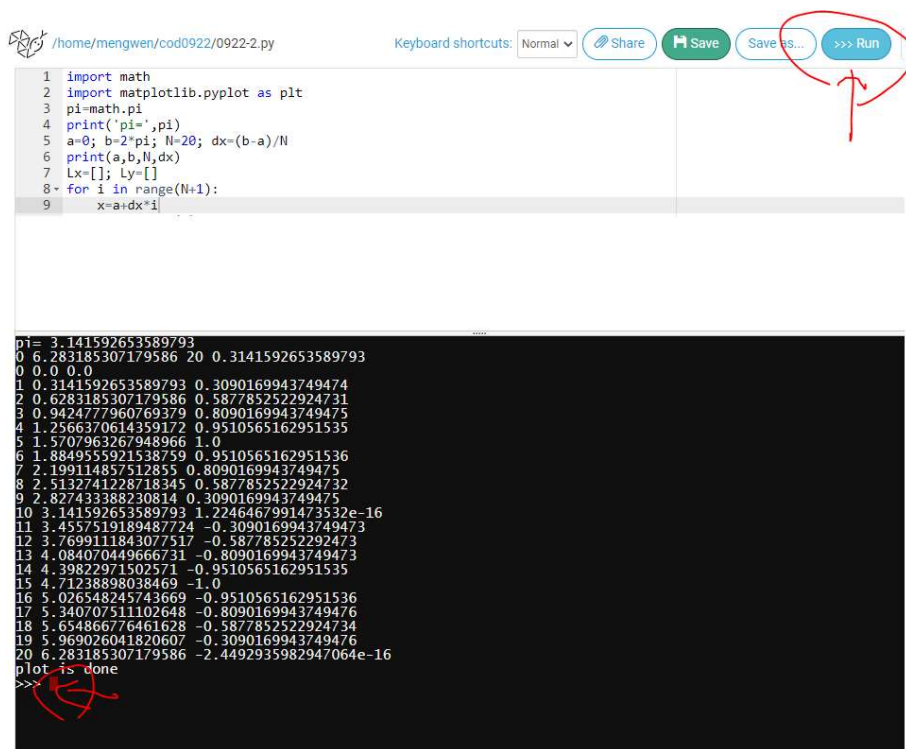
『重新載入』和『重新載入頁框』

<https://physexp.thu.edu.tw/~AP/YC/COD/>

網頁有三個頁框



滑鼠移到下方，紅色游標處，按『Ctrl +D』  
再按『RUN』



畫出格線

```
plt.grid()
```

畫出水平線 (x 軸)

```
plt.plot([0,2*pi],[0,0],'k-')
```

(0,0) 到 (0,2pi)，兩點一線

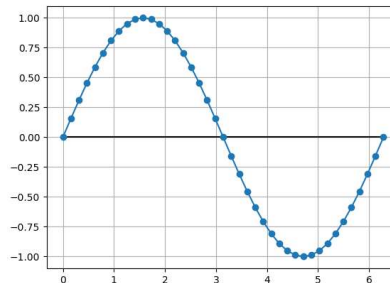


/home/mengwen/cod0922/0922-2.py

```

1 import math
2 import matplotlib.pyplot as plt
3 pi=math.pi
4 print('pi=',pi)
5 a=0; b=2*pi; N=40; dx=(b-a)/N
6 print(a,b,N,dx)
7 Lx=[]; Ly=[]
8 for i in range(N+1):
9     x=a+dx*i
10    y=math.sin(x)
11    Lx.append(x)
12    Ly.append(y)
13    #print(i,x,y)
14 plt.grid()
15 plt.plot([0,2*pi],[0,0],'k-')
16 plt.plot(Lx,Ly,'o-')
17 plt.savefig("sinx-1.png")
18 print('plot is done')

```



計算面積：

```

import math
import matplotlib.pyplot as plt
pi=math.pi
print('pi=',pi)
a=0; b=2*pi; N=40; dx=(b-a)/N
print(a,b,N,dx)
Lx=[]; Ly=[];A=0
for i in range(N+1):
    x=a+dx*i
    y=math.sin(x)
    ai=y*dx
    Lx.append(x)
    Ly.append(y)
    if (x>1 and x<3):
        A+=ai
        print(i,x,y,ai)
print('Area=',A)
plt.grid()
plt.plot([0,2*pi],[0,0],'k-')
plt.plot(Lx,Ly,'o-')
plt.savefig("sinx-1.png")
print('plot is done')

```



/home/mengwen/cod0922/0922-2.py

```
1 import math
2 import matplotlib.pyplot as plt
3 pi=math.pi
4 print('pi=',pi)
5 a=0; b=2*pi; N=40; dx=(b-a)/N
6 print(a,b,N,dx)
7 Lx=[]; Ly=[];A=0
8 for i in range(N+1):
9     x=a+dx*i
10    y=math.sin(x)
11    ai=y*dx
12    Lx.append(x)
13    Ly.append(y)
14    if (x>1 and x<3):
15        A+=ai
16        print(i,x,y,ai)
17 print('Area=',A)
18 plt.grid()
19 plt.plot([0,2*pi],[0,0], 'k-')
20 plt.plot(Lx,Ly, 'o-')
21 plt.savefig("sinx-1.png")
22 print('plot is done')
```

```
pi= 3.141592653589793
0 6.283185307179586 40 0.15707963267948966
7 1.0995574287564276 0.8910065241883678 0.13995897753453762
8 1.2566370614359172 0.9510565162951535 0.14939160823707778
9 1.413716694115407 0.9876883405951378 0.1551457217424989
10 1.5707963267948966 1.0 0.15707963267948966
11 1.7278759594743862 0.9876883405951378 0.1551457217424989
12 1.8849555921538759 0.9510565162951536 0.1493916082370778
13 2.0420352248333655 0.8910065241883679 0.13995897753453765
14 2.199114857512855 0.8090169943749475 0.1270800923078815
15 2.356194490192345 0.7071067811865476 0.11107207345395916
16 2.5132741228718345 0.5877852522924732 0.09232909152452286
17 2.670353755551324 0.45399049973954686 0.07131266093906596
18 2.827433388230814 0.3090169943749475 0.048540275968136676
19 2.9845130209103035 0.15643446504023098 0.024572668306931948
Area= 1.5209791102082166
plot is done
>>> 13 2.0420352248333655 0.8910065241883679 0.13995897753453765
```

## 第 02 週作業：0922-HW

0.安裝與簡介 AI思維與程式設計 公告 上傳 pyanywhere glowscript

PY-1基本1

- 資料與變數
- 運算式
- 迴圈與邏輯判斷
- 格式化輸出
- 等加速運動
- 0915class-1
- 0915class-2
- 等加速運動
- 0915class-3
- glowscript
- 0915class-4
- sin(x) 函數
- 範例程式1**
- 範例程式2

PY-2基本2

PY-3列表

PY-4字串

PY-5檔案

PY-6函數

PY-7爬蟲程式

PY-8畫圖

9.VPYTHON

### PYTHON範例程式-1

#### 1. input

```
a=input('input integer a=')
print(type(a),a)
b=input('input integer b=')
print(type(b),b)
print('a+b=',a+b)
A=int(a)
B=int(b)
print(type(A),type(B),' A+B=',A+B)
```

#### 2. input + if...

- input
- if ... elif ... else ...

```
a=input('input a=')
b=input('input b=')
if(a > b):
    print('a is greater than b.')
elif(a == b):
    print('a is equal to b.')
```

input  
input  
a is  
-----  
input  
input  
a is



/home/mengwen/cod0922/0922-3.py

```

1 a=input('input integer a=')
2 print(type(a),a)
3 b=input('input integer b=')
4 print(type(b),b)
5 c='SSS'
6 print('a+b=',a+c+b)
7 A=int(a)
8 B=int(b)
9 print(type(A),type(B),' A+B=',A+B)

```

```

input integer a=3
<class 'str'> 3
input integer b=5
<class 'str'> 5
a+b= 3SSS5
<class 'int'> <class 'int'>  A+B= 8
>>>

```

字串...

相加，把字（文字）連起來

A=3

B=5

A+B...字串相加，結果是 35

整數...

相加，把數字加起來

A=3

B=5

A+B...數字相加，結果會是 8

Int(a)...數字 a，要加上 int()才會被判定為數字

a.....字串 a，沒加上 int()，會被判斷成字串（文字）