Python 程式設計作業

範圍： 條件判斷與迴圈二

銘傳大學電腦與通訊工程系

班　　級	電通四乙
姓　　名	謝祥郁
學　　號	05051053
作業成果	應繳作業共 10 題，每題 10 分 我共完成 10 題，應得 100 分
授課教師	陳慶逸

■ 請確實填寫自己寫完成題數，填寫不實者(如上傳與作業明顯無關的答案，或是計算題數有誤者)，本次作業先扣 50 分。

EX 1:試設計一程式，當使用者輸入兩個正整數 h 和 w，程式會交錯使用「+」和「-」輸出一個長寬分別為 h 和 w 的長方形。

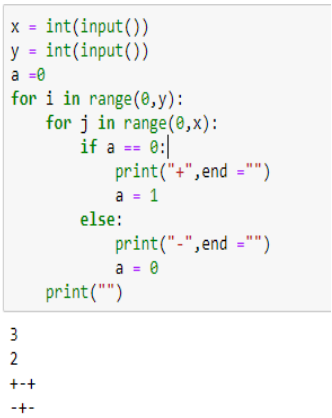
例如:

Input: **3** **2**	**Output:** +-+ -+-
7 **6**	+-+-+-+ -+-+-+- +-+-+-+ -+-+-+- +-+-+-+ -+-+-+-
6 **7**	+-+-+- +-+-+- +-+-+- +-+-+- +-+-+- +-+-+- +-+-+-

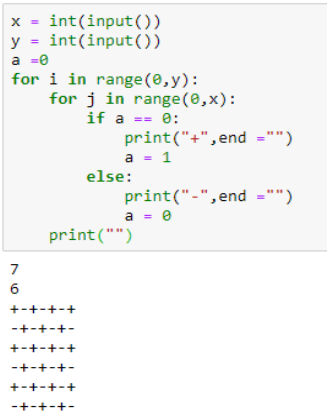
程式碼：

```
x = int(input())
y = int(input())
a =0
for i in range(0,y):
    for j in range(0,x):
        if a == 0:
            print("+",end ="")
            a = 1
        else:
            print("-",end ="")
            a = 0
    print("")
```

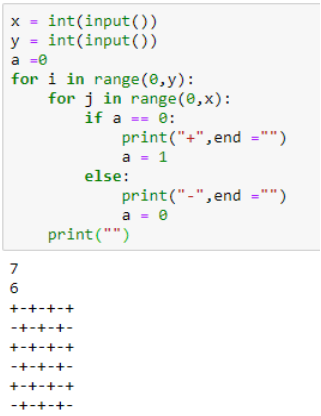
執行結果擷圖：



```
3
2
+-+
-+-
```

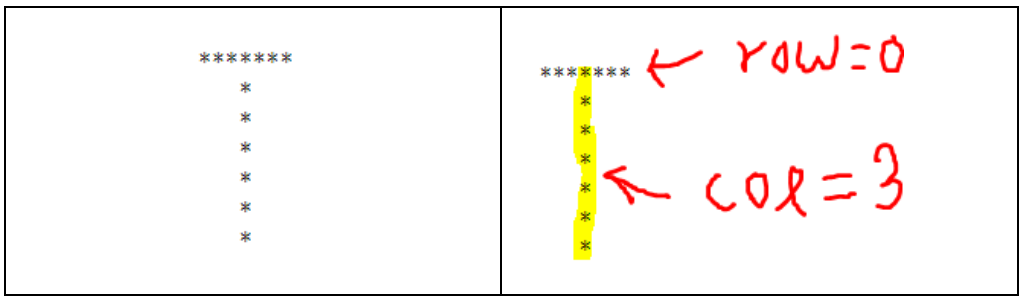


```
7
6
+-+-+-+
-+-+-+-
+-+-+-+
-+-+-+-
+-+-+-+
-+-+-+-
```



```
7
6
+-+-+-+
-+-+-+-
+-+-+-+
-+-+-+-
+-+-+-+
-+-+-+-
```

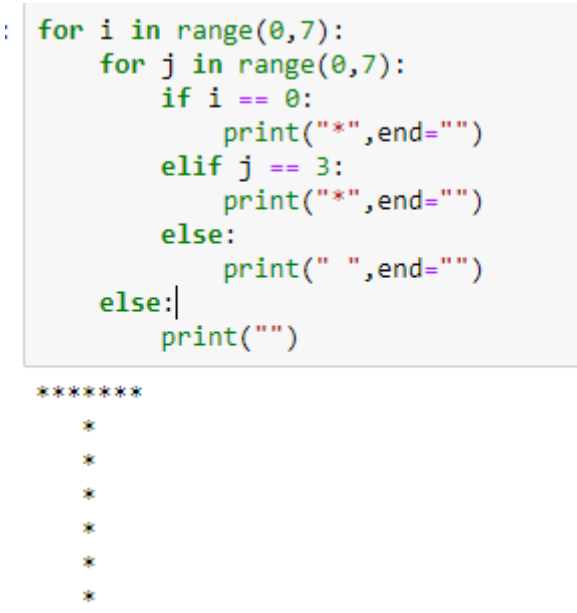
EX 2: 試撰寫一個 Python 程式來列印字母'T'的形狀：



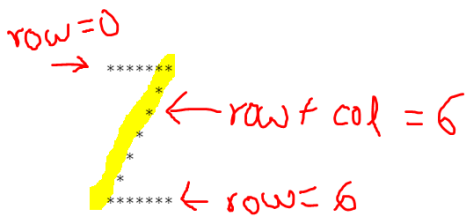
程式碼：

```
for i in range(0,7):
    for j in range(0,7):
        if i == 0:
            print("*",end="")
        elif j == 3:
            print("*",end="")
        else:
            print(" ",end="")
    else:
        print("")
```

執行結果擷圖：



EX 3: 試撰寫一個 Python 程式來列印字母'Z'的形狀：

程式碼：

```
for i in range(0,7):
    for j in range(0,7):
        if i == 0 or i==6:
            print("*",end="")
        elif i+j == 6:
            print("*",end="")
        else:
            print(" ",end="")
    else:
        print("")
```

執行結果擷圖：

```
for i in range(0,7):
    for j in range(0,7):
        if i == 0 or i==6:
            print("*",end="")
        elif i+j == 6:
            print("*",end="")
        else:
            print(" ",end="")
    else:
        print("")
```

```
*******
      *
     *
    *
   *
  *
*******
```

EX4: 試撰寫一個 Python 程式來列印字母'E'的形狀：

```
*******
*
*
*****
*
*
*******
```

程式碼：

```
for i in range(0,7):
    for j in range(0,7):
        if i == 0 or i==6:
            print("*",end="")
        elif j ==0:
            print("*",end="")
        elif i==3 and j<5:
            print("*",end="")
        else:
            print(" ",end="")
    else:
       print("")
```

執行結果擷圖：

```
for i in range(0,7):
    for j in range(0,7):
        if i == 0 or i==6:
            print("*",end="")
        elif j ==0:
            print("*",end="")
        elif i==3 and j<5:
            print("*",end="")
        else:
            print(" ",end="")
    else:
        print("")
```

```
*******
*
*
*****
*
*
*******
```

EX5: 試撰寫一個 Python 程式來列印字母'A'的形狀：

程式碼：

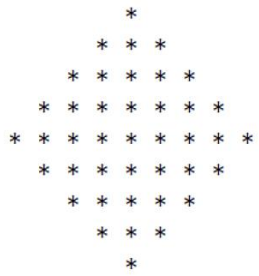
```
for i in range(0,7):
    for j in range(0,5):
        if i == 0 and j in range(1,4):
            print("*",end="")
        elif i != 0 and j ==0:
            print("*",end="")
        elif i != 0 and j ==4:
            print("*",end="")
        elif i==3 :
            print("*",end="")
        else:
            print(" ",end="")
    else:
        print("")
```

執行結果擷圖：

```
for i in range(0,7):
    for j in range(0,5):
        if i == 0 and j in range(1,4):
            print("*",end="")
        elif i != 0 and j ==0:
            print("*",end="")
        elif i != 0 and j ==4:
            print("*",end="")
        elif i==3 :
            print("*",end="")
        else:
            print(" ",end="")
    else:
        print("")
```

```
 ***
*   *
*   *
*****
*   *
*   *
*   *
```

EX6: 試撰寫一個 Python 程式來列下面形狀：



程式碼：

```
for i in range(0,5):
    for j in range(0,4-i):
        print("  ",end="")
    for k in range(0,2*i+1):
        print("* ",end="")
    print()
for i in range(4,0,-1):
    for j in range(0,4-i+1):
        print("  ",end="")
    for k in range(0,2*i-1):
        print("* ",end="")
    print()          else:
                print("  ",end="")
    else:
        print("")
```

執行結果擷圖：

```
for i in range(0,5):
    for j in range(0,4-i):
        print("  ",end="")
    for k in range(0,2*i+1):
        print("* ",end="")
    print()
for i in range(4,0,-1):
    for j in range(0,4-i+1):
        print("  ",end="")
    for k in range(0,2*i-1):
        print("* ",end="")
    print()
```

```
        *
      * * *
    * * * * *
  * * * * * * *
* * * * * * * * *
  * * * * * * *
    * * * * *
      * * *
        *
```

EX7: 試撰寫一個 Python 程式來列下面形狀：

```
* * * * * *
*         *
*         *
*         *
*         *
* * * * * *
```

程式碼：

```
for i in range(0,6):
    for j in range(0,6):
        if i == 0:
            print("* ",end="")
        elif   j == 0:
            print("* ",end="")
        elif   j == 5:
            print("* ",end="")
        elif i== 5:
            print("* ",end="")
        else:
            print("   ",end="")
    else:
        print("")
```

執行結果擷圖：

```
for i in range(0,6):
    for j in range(0,6):
        if i == 0:
            print("* ",end="")
        elif  j == 0:
            print("* ",end="")
        elif  j == 5:
            print("* ",end="")
        elif i== 5:
            print("* ",end="")
        else:
            print("  ",end="")
    else:
        print("")
```

```
* * * * * *
*         *
*         *
*         *
*         *
* * * * * *
```

EX8: 若有一個 point_list = [(2, 8),(3, 5),(4, 6),(1.5, 7), (2, 6),(6, 5),(4, 6),(2.5, 1.7)]，試求(9, 4)與這個 list 中每一個座標點的歐式距離值。

答案型式如下:

```
0.0
1.5848931924611136
1.5157165665103982
...
```

程式碼：

```
point_list = [(2, 8),(3, 5),(4, 6),(1.5, 7), (2, 6),(6, 5),(4, 6),(2.5, 1.7)]
for i in point_list:
    k = ((9-i[0])**2+(4-i[1])**2)**0.5
    print(k)
```

執行結果擷圖：

```
point_list = [(2, 8),(3, 5),(4, 6),(1.5, 7), (2, 6),(6, 5),(4, 6),(2.5, 1.7)]
for i in point_list:
    k = ((9-i[0])**2+(4-i[1])**2)**0.5
    print(k)
```

```
8.06225774829855
6.082762530298219
5.385164807134504
8.077747210701755
7.280109889280518
3.1622776601683795
5.385164807134504
6.8949256703752795
```

EX9: 若有一個 point_list = [(2, 8),(3, 5),(4, 6),(1.5, 7), (2, 6),(6, 5),(4, 6),(2.5, 1.7)]，試找出(9, 4)與這個 list 中每一個座標點之歐式距離值的最小者。

程式碼：

```
point_list = [(2, 8),(3, 5),(4, 6),(1.5, 7), (2, 6),(6, 5),(4, 6),(2.5, 1.7)]
k=[]
for i in point_list:
    k.append(((9-i[0])**2+(4-i[1])**2)**0.5)

print("最小值=",min(k),end =" ")
print(",座標點=",point_list[k.index(min(k))])
```

執行結果擷圖：

```
point_list = [(2, 8),(3, 5),(4, 6),(1.5, 7), (2, 6),(6, 5),(4, 6),(2.5, 1.7)]
k=[]
for i in point_list:
    k.append(((9-i[0])**2+(4-i[1])**2)**0.5)
print("最小值=",min(k),end =" ")
print(",座標點=",point_list[k.index(min(k))])
```

```
最小值= 3.1622776601683795 ,座標點= (6, 5)
```

EX10: 鳶尾花資料集是非常著名的生物資訊資料集之一，取自美國加州大學歐文分校的機器學習資料庫 http://archive.ics.uci.edu/ml/datasets/Iris，資料的筆數為 150 筆，共有五個欄位：

1. 花萼長度(Sepal Length)：計算單位是公分。
2. 花萼寬度(Sepal Width)：計算單位是公分。
3. 花瓣長度(Petal Length) ：計算單位是公分。
4. 花瓣寬度(Petal Width)：計算單位是公分。
5. 類別(Class)：可分為 Setosa，Versicolor 和 Virginica 三個品種。

試求 [4.21 3.02 1.09 0.1] 與 Iris data 中 150 筆資料的歐式距離值，並將每一筆距離的計算結果利用.append 敘述存在 mylist 這個串列(list)之中。

程式碼：

```
from sklearn import datasets
iris = datasets.load_iris()
Y = [4.21,3.02 ,1.09,0.1]
X = iris.data[:, :4]
mylist = []
for i in range(0,len(X)):
    c = (((Y[0]-X[i][0])**2+(Y[1]-X[i][1])**2+(Y[2]-X[i][2])**2+(Y[3]-X[i][3])**2)**0.5)
    mylist.append(c)
print(c)
```

執行結果擷圖：

```
from sklearn import datasets
iris = datasets.load_iris()
Y = [4.21,3.02 ,1.09,0.1]
X = iris.data[:, :4]
mylist = []
for i in range(0,len(X)):
    c = (((Y[0]-X[i][0])**2+(Y[1]-X[i][1])**2+(Y[2]-X[i][2])**2+(Y[3]-X[i][3])**2)**0.5)
    mylist.append(c)
mylist
```

```
[1.0623558725775462,
 0.7632823854904556,
 0.5714892824891822,
 0.5801723881744113,
 1.0327632836231155,
 1.6286804474788787,
 0.6577233460962135,
 0.9729337079164232,
 0.3957271787481877,
 0.8065977932030316,
 1.4340850741849316,
 0.8732697177848318,
 0.6667833231267859,
 0.0927361849549569,
 1.8736595208308255,
 2.0934660255184467,
 1.5246638973885362,
 1.0763828315241746,
 1.8001666589513319,
```