

Python Quiz #1

1. What is the output after the following sequence of Python statements?

```
>>> x = 3
>>> y = 2
>>> x = y * 2 + x
>>> y = 3 * x
>>> (x, y)
```

- a. (3, 7)
- b. (3, 9)
- c. (7, 21)
- d. (7, 9)
- e. (9, 27)

Sol. 第三行：x 改為 2*2+3=7，第四行：y 改為 3*7=21

2. In the following interactive session, what does Python output on the screen?

```
>>> x = 'ChatGPT'
>>> x[-3:-1]
```

- a. 'PT'
- b. 'GPT'
- c. 'GP'
- d. Index out of bound
- e. 'hat'

Sol. 從第-3 個元素開始到第-1 個(不含)，故為 GP。

3. Which of the following are built-in functions of Python? Choose all that apply.

- a. ls
- b. input
- c. print
- d. mkdir
- e. pwd

Sol. 其他都是 shell command，可參考下表。

Built-in Functions			
A abs() aiter() all() any() anext() ascii()	E enumerate() eval() exec()	L len() list() locals()	R range() repr() reversed() round()
B bin() bool() breakpoint() bytearray() bytes()	F filter() float() format() frozenset()	M map() max() memoryview() min()	S set() setattr() slice() sorted() staticmethod() str() sum() super()
C callable() chr() classmethod() compile() complex()	G getattr() globals()	N next()	T tuple() type()
D delattr() dict() dir() divmod()	H hasattr() hash() help() hex()	O object() oct() open() ord()	V vars()
	I id() input() int() isinstance() issubclass() iter()	P pow() print() property()	Z zip()
			<code>__import__()</code>

4. How do you change the current working directory to the parent directory in a shell such as bash?

- a. cd ./.
- b. cd ..
- c. cd /..
- d. cd ./
- e. cd /.

Sol. 固定用法。

5. In Python 3.7 as taught in this course, what is the outcome of executing the two interactive lines?

```
>>> L = (3,4,5)
>>> L + (4,5,6)
```

- a. None of the other answer is correct.
- b. ((3, 4, 5), (4, 5, 6))
- c. (7, 1, 11)
- d. (3, 4, 5, 4, 5, 6)
- e. 'tuple' object does not support item assignment.

Sol. tuple 雖然不能被修改，但可以用+運算符號創造新 tuple，過程中並未修改到原本的 tuple。

6. Which of the following is not a comparison operator? Choose all that apply.

- a. ==
- b. <

- c.
- d.
- e.

e.

Sol. #後的都會被當成註解。

Sol. 只有等於，大於小於，大於等於小於等於是。

7. Which of the following identifiers are **illegal**?

Choose all that apply.

- a. percentage%
- b. the+best
- c. two_more
- d. \$thirty
- e. my@name

Sol. ab：包含運算符，de：\$和@不能被拿來命名。

8. Which of the following is a *single-line comment* in Python?

- a.
- b.
- c.
- d.
- e.

Sol. 註解的固定用法。

9. Which of the following identifiers is in camel case?

- a.
- b.
- c.
- d.
- e.

Sol. c 為 **lower camel case**，第一個詞的開頭小寫，其餘以大寫開頭。若第一個詞的開頭也是大寫則為 **upper camel case**。

10. What is the output of the following interactive lines in Python?

```
>>> x = 11 * 2 + 4 # 3 - 5 * 7
>>> x
```

- a.
- b.
- c.
- d.

Python Quiz #2

1. How is a line feed represented as a string literal.

換行符如何表為字串文字

- a) '\b'
- b) '\r'
- c) '\n'
- d) '\t'
- e) '\l'

Sol. 固定用法。

2. What is the value of the expression

```
'%06d-%02d=%05d' % (9876, 543, 9333)
```

- a) '9876-543=9333'
- b) '009876-543=09333'
- c) '009876-54=09333'
- d) '09876-543=09333'
- e) '9876 - 543 = 9333'

Sol. %0?: 留?個字元的位置，若不滿?個字元則用 0 補，若超過則照算。

3. Which of the following expression evaluates to True.

- a) 'Bubbletea' > 'bubbleTea'
- b) 'BUBBLE' > 'Bubble'
- c) 'Bubble' > 'bubble'
- d) 'bubble' > 'Bubble'
- e) 'bubblesort' > 'bubbletea'

```
# ord('B') = 66
# ord('b') = 98
# ord('s') = 115
```

Sol. 依序比每個字元的 ord()，同一個字元小寫的 ord() 比大寫的還要高。

4. Which of the following statements about chr() and ord() in Python are **true**? Select all that apply.

- a) ord() can raise a **TypeError** if the input is not a single character or string, while chr() can raise a **ValueError** if the code point is not a valid Unicode point.
- # ord(a) : **NameError**

```
# ord('Hello') : TypeError
# chr(123456789) : ValueError
# chr('123') : TypeError
```

b) ord() returns the integer Unicode code point of a character, while chr() returns the corresponding character for a given code point.

c) Both chr() and ord() only work with ASCII characters.

```
# ord('A') : 65 - ASCII character
# ord('ᄀ') : 127801 - Unicode character
# chr(65) : 'A' - ASCII character
# chr(127801) : 'ᄀ' - Unicode character
```

d) chr() and ord() are inverse functions, meaning that chr(ord(x)) == x for any character x.

```
#
```

e) chr() and ord() can be used to convert between character and their binary representations.

用 ord() 將字符轉為其 Unicode 編碼再用 bin() 轉為二進制，例如：

```
>>> bin(ord('s'))
'0b11110011'
>>> chr(0b11110011)
's'
```

Sol. c：兩者都可用 Unicode，d、e：不確定(網路找不到答案或反例)。

5. What is the Boolean value of the expression

```
'10' and []
```

```
# bool():
>>> bool(10)
True
>>> bool([])
False
```

- a) ['1', '0']
- b) []
- c) '10'
- d) ['10']
- e) True

Sol. 運算結果應該要回傳一個 **False** 的東西，選 **b.**(操作機制應該是在兩者裡面選 **False** 的那一邊，如果都是 **False** 則選第一個)。

```
# another :
>>> () and []
()
>>> [] and ()
[]
```

6. What is the value of the expression:
`len(''This\town\near\river is\nice!''')`
- a) 25
 - b) 33
 - c) 29
 - d) 37
 - e) 21

Sol. `\t`、`\n`、`\r` 都只會被算成一個字元。

```
# another :
>>> len('\n')
2
>>> print('\n')
\n
```

7. If `data.csv` contains the following lines:

```
John,28,Seattle
Mary,34,New York
David,42,Los Angeles
```

What is the value of `'lines'` after executing the following statements?

```
fh = open('data.csv', 'r')
lines = fh.readlines()
fh.close()
```

- a) `[['John','28','Seattle'], ['Mary','34','New York'], ['David','42','Los Angeles']]`
- b) `['John,28,Seattle \n', 'Mary,34,New York \n', 'David,42,Los Angeles \n']`
- c) `['John,28,Seattle', 'Mary,34,New York', 'David,42,Los Angeles']`
- d) `['John','28','Seattle'], ['Mary','34','New York'], ['David','42','Los Angeles']`

e) `['John','28','Seattle\n','Mary','34','New York\n','David','42','Los Angeles\n']`

Sol. 會吃每一行，包含換行符號。

8. Which of the following choices are equal to the value

`~0b0100 & 0x0A`

- a. `0x05`
- b. `10`
- c. `0x0A`
- d. `0o12`
- e. `5`

Sol. `~0b0100 & 0x0A == 0b1011 & 0b1010 == 0b1010 == 10`，選所有選項=10 的答案(b：2 進位，x：16 進位，o：8 進位)。

```
# 轉為二進制：
~0b0100 = 0b1011
0x0A = 0b1010
# 計算：
    0b1011
& 0b1010
-----
    0b1010
```

9. (1) What is value of `'Hello'.find('e')`

(2) What is value of `'Hello'.find('h')`

(3) What is value of `'Hello'.find('l')`

- a) 2
- b) 1
- c) 0
- d) 3
- e) -1

Sol. (1)b (2)e (3)a，若有找到會回傳該位置，沒找到會回傳-1，找到複數個 會回傳第一個的位置。

10. Suppose you run the command

```
$ python3 mycat.py mary.txt lamb.txt
Inside the mycat.py program, suppose you have
import sys
```

- (1) What is the value of `len(sys.argv)`?
- (2) What is the value of `sys.argv`?
- (3) What is the value of `sys.argv[1:]`?

Sol.

- (1) 3，因為在 `python3` 後面有三個 `argument`
- (2) `['mycat.py', 'mary.txt', 'lamb.txt']`
- (3) `['mary.txt', 'lamb.txt']`（如果這題有寫錯，以講義的為主）

取得 `command line` 的 `arguments`

`showargs.py` 內容：

```
#!/usr/bin/env python3
```

```
import sys
```

```
print(sys.argv)
```

command window：

```
$ python3 showargs.py
```

```
['showargs.py']
```

```
$ python3 showargs.py a1 a2
```

```
['showargs.py', 'a1', 'a2']
```

Python Quiz #3

1. If `S = ['h', 'e', 'l', 'l', 'o']`, what is the value of `S` after executing the statement `S[1:2]='a'`?

- a) `['h', 'a', 'l', 'l', 'o']`
- b) `['h', 'a', 'l', 'l', 'o']`
- c) `['h', 'e', 'l', 'l', 'o']`
- d) `['a', 'l', 'l', 'o']`
- e) `['h', 'e', 'l', 'l', 'a']`

Sol. 改第 1 號到第 1 號位置的元素。

2. What is the value of `y` after executing the following sequence of statements?

```
1 a = [1, 2, 3]
2 b = a
3 a[2] = 4
4 c = [1, 2, 3]
5 d = c[:]
6 c[2] = 4
7 y = b + d
```

- a) `[1, 2, 3, 1, 2, 3]`
- b) `[1, 2, 4, 1, 2, 3]`
- c) `[1, 2, 4, 1, 2, 4]`
- d) `[1, 2, 3, 2, 4]`
- e) `[1, 2, 3, 1, 2, 4]`

Sol. `b` 是被令成跟 `a` 一樣(被指到 `a` 的存放空間), `d` 是複製 `c` 在當下的所有元素(沒有被指到 `c` 的存放空間), 因此後者更改 `c` 的內部元素時 `d` 不會跟著被改。

3. What is the value of `y` after executing the following sequence of statements?

```
1 import copy
2 z = ['a', 'b']
3 x = [1, 'z', 3]
4 y = copy.copy(x)
5 x[0] = 4
6 z.append('c')
```

- a) `[1, ['a', 'b', 'c'], 3]`
- b) `[1, ['a', 'b'], 3]`
- c) `[4, ['a', 'b', 'c'], 3]`
- d) `[4, ['a', 'b'], 3]`
- e) `[3, ['a', 'b', 'c'], 4]`

Sol. `y` 只複製 `x` 的內容, `x` 的內容裡的第一號位置存放的是 `z` 變數的位置, 因此更改 `z` 會影響到 `y` 的值, 但更改 `x` 不會。

4. Given a list `l = ['f', 'r', 'o', 'g', '']`, which of the following statements is true?

- a) After executing `l.pop(-1)`, the value of `l` is `['f', 'r', 'o', 'g', '']`
- b) After executing `l.append('s')`, the value of `l` is `['s', 'f', 'r', 'o', 'g', '']`
- c) After executing `l.insert(3, 's')`, the value of `l` is `['f', 'r', 'o', 'g', 's', '']`
- d) After executing `l = [:1] + l[3:]`, the value of `l` is `['f', 'r', 'g', '']`
- e) After executing `l.pop(0)`, the value of `l` is `['r', 'o', 'g', '']`

Sol. `a`: 拔掉最後一個, `b`: 會加在最後面, `c`: 應該是插在 `o` 跟 `g` 中間, `d`: 應該只有 `fg` 空白。

5. Given the dictionary `eng = {'one':1, 'two':2, 'three':3, 'four':4}`, which of the following expression causes an error? Choose all that apply.

- a) `4 in eng`
- b) `'three' in eng`
- c) `{ 'one': 1 } in eng`
- d) `('two', 2) in eng`
- e) `eng in { 'one': 2 }`

Sol. `c`: 前面只吃單一值或 `tuple`, `e`: 錯的地方多到不知道怎麼講。

6. Which of the following cannot be a member of a set?

- a) `('Mary', 'had', 'a', 'little', 'lamb')`
- b) `{ 'Mary', 'had', 'a', 'little', 'lamb' }`
- c) `()`
- d) `2+4j`
- e) `'Mary had a little lamb'`

Sol. 裡面不能再放一個 `set`。

7. Which of the following is **incorrect** about `enumerate`?

- a) `list(enumerate(range(5,8)))` evaluates to `[(0, 5), (1, 6), (2, 7)]`
- b) `list(enumerate(['Sun', 'Mon', 'Tue']))` evaluates to `[(0, 'Sun'), (1, 'Mon'), (2, 'Tue')]`
- c) `list(enumerate('abc'))` evaluates to `[(0,`

`'abc']]`

- d) `list(enumerate(['Jan', 'Feb', 'Mar'], start = 1))` evaluates to `[(1, 'Jan'), (2, 'Feb'), (3, 'Mar')]`
- e) `list(enumerate('abc'))` evaluates to `[(0, 'a'), (1, 'b'), (2, 'c')]`

Sol. 見 e，這題選項出得很爛可以用刪去法猜。

8. Which of the following statements changes the list `L` to its reverse **without mutation**?

- a) `L = L[:1] + L[2:]`
- b) `L = L[::-1]`
- c) `L[:-1] = L[-1:]`
- d) `L[::-1] = L[:]`
- e) `L = L[:-1]`

Sol. b、d 都有同樣效果，我也不確定答案是哪個但我直覺認為是 d，可以再查看講義。

9. Given the following nested if-statement

```
1 if x < 0:
2   if y > 5:
3     print('Fine')
```

Which of the following single if-statement is equivalent?

a)

```
1 if(x < 0) elif(y > 5):
2   print('Fine')
```

b)

```
1 if x > 0 or y < 5:
2   print('Fine')
```

c)

```
1 if x > 0 and y < 5:
2   print('Fine')
```

d)

```
1 if (x < 0) != (y > 5):
2   print('Fine')
```

e)

```
1 if (x >= 0) or (y <= 5):
2   print('Fine')
```

Sol. 略。

10. Given the following Python code:

```
1 def find(L, val):
2   i = 0
3   while i < len(L):
4       if L[i] == val:
5           return i
6       i = i + 1
7   return -1
```

Rewrite it in Pythonic style using a for loop.

Sol.

```
def find(L, val):
    for i in range(len(L)):
        if L[i] == val:
            return i
    return -1
```

Python Quiz #4

1. Given a dictionary:

```
D = {'Sun': '0', 'Mon': '1', 'Tue': '2', 'Wed': '3'}
```

Which of the following statements and the corresponding exceptions is correct? **Choose all that apply.**

- a) `D[2]` -> `KeyError`
- b) `D['Mon']` -> `KeyError`
- c) `D[2]` -> `IndexError`
- d) `D['Fri']` -> `KeyError`
- e) `D['3']` -> `IndexError`

Sol. dictionary 查找時是用 key 去找的，所以裡面輸入不存在的 Key 都會跳 `KeyError`，b 是因為 'Mon' 存在所以不會跳錯。

2. What kind of exception do you get when you run the following Python code?

```
1 L = 'Hello World!'
2 print(L[1])
```

- a) `NameError`
- b) `OSError`
- c) `IndexError`
- d) `KeyError`
- e) `TypeError`

Sol. 因為輸入的 Index 不是 `int`，所以會先跳 `TypeError`，如果輸入的是 `int` 但是是超出範圍的 index 才會跳 `IndexError`。

3. There are two tuples

```
A = (1, 3, 7, 0, 5)
```

```
B = (2, 4, 10, 2, 8)
```

Which of the following results is/are an integer?

Choose all that apply

- a) `max(A,B)`
- b) `max((A,B))`
- c) `max(*(A,B))`
- d) `max(*(A+B))`
- e) `max(*A,*B)`

Sol. a.會跑出比較大的那個 tuple，b.會跑出(A,B)這個 tuple，c.跟 a.是同義。

4. What is the type of the following function's return value?

```
1 def triAlpha(a,b,c):
2     return a * b, (a * b) * c
```

- a) dictionary
- b) str
- c) set
- d) list
- e) tuple

Sol. 這種用逗點分開的輸出就是 tuple。

5. What is the result after executing the following code?

```
1 def moreAndMoreTax(price, rate = 0.05):
2     ans = price * (1 + rate)
3     rate += 0.01
4     return ans
5 moreAndMoreTax(30, 0.1)
6 print('The tax rate is:', rate)
```

Assume no other variables are defined globally.

- a) `NameError`
- b) The tax rate is: 0.11
- c) The tax rate is: 0.06
- d) The tax rate is: 0.05
- e) The tax rate is: 0.15

Sol. global 沒有 rate 這個變數。

6. Which of the following is an `ArithmeticError`? **Choose all that apply.**

- a) `OverflowError`
- b) `ZeroDivisionError`
- c) `IndexError`
- d) `FloatingPointError`
- e) `ValueError`

Sol. 用背的。

7. Given the following code snippet.

```
1 filenames = ['chicken', 'pork', 'beaf']
2 filenum = input('select a file:')
3 i = int(filenum)
4 fh = open(filenames[i], 'r')
```


If the user gives `5` as input, this program will raise an exception. What is the type of exception?

- a) `IndexError`
- b) `OSError`
- c) `TypeError`
- d) `ValueError`
- e) `KeyError`

Sol. 第四行在查找第 `i` 個位置時會先找不到這個 `index`，所以先回報 `IndexError`(不選 `OSError` 是因為整個程式還沒進到開檔案的步驟)。

8. Given the following text file and code snippet.

Mary.txt:

```
Mary had a little lamb.
```

Read.py:

```
1 with open('Mary.txt', 'r') as fh:
2     x = fh.readlines()
3     print(len(x), len(x[0]))
```

What is the result of running this program? Note that there is a single blank between every words in Mary.txt.

- a) 1 5
- b) 5 23
- c) 1 24
- d) 0 5
- e) 1 23

Sol. 這題有送這兩個選項，因為看不出最後面有沒有換行，有的話答案就應該是 24，沒有就是 23(這類有爭議的題目之後應該是不會考)。

9. Given the following code snippet.

```
1 x = 1
2 y = 2
3 def Double(y):
4     global x
5     x = x*2
6     y = y*2
7
8 Double(4)
9 print(x,y)
```

What is the result of running this program?

- a) 2 4
- b) 1 2
- c) 2 8
- d) 2 2
- e) 1 8

Sol. 只有在 `global` 的 `x` 會被改到。

10. Given the following code snippet.

```
1 x = 'Hello World!'
2 def foo():
3     print(x)
4
5 foo()
```

What is the result of running this program?

- a) `ValueError`
- b) `TypeError`
- c) `Hello World!`
- d) `'Hello World!'`
- e) `NameError`

Sol. 函式內部找不到 `x` 這個變數的時候會往上找，所以不會找不到在 `global` 的 `x`。

Python Quiz #5

1. Which of the following is not a recursive data type in Python? A recursive data type can contain an object of its own type.

- a) dict
- b) list
- c) set
- d) tuple
- e) All of the above types are recursive

Sol. set 裡的元素不能放 set

遞迴型資料，可以放入與自己同類型的資料型式

2. What is the value of the code below?

```
list(map(max,[1,7,2,7],[5,6,3,0]))
```

- a) 7
- b) [1,6,2,0]
- c) [1,7,2,7]
- d) [5,6,3,0]
- e) [5,7,3,7]

Sol. 會輸出每個位置比較大的數字

map(function, 參數)
function 一般是 max() 型式，去掉括號放入 map 中

3. What does the unknown_function do?

```
1 def unknown_function(p = '.'):
2     import os
3     if not os.path.isdir(p):
4         return 1
5     unknown_variable = os.listdir(p)
6     return sum(map(unknown_function,
7                   unknown_variable))
```

- a) Count the number of files in the current directory.
- b) Count the number of files plus directories recursively.
- c) Count the number of files recursively.
- d) Count the number of directories

recursively.

e) None of the above.

Sol. 如果還有往下的 file 就繼續找，沒有就回傳 1，所以全部跑完等於會跑過所有的 file，不能再跑的時候回傳 1，加起來就是總共有多少 file

os.path.isdir(p) 回傳 True or False

4. Which of the following can properly sort a list of month names by month order?

Assuming the following global symbols have been defined.

Choose all that apply.

```
L = ['Apr', 'May', 'Nov', 'Mar', 'Jan',
     'Feb', 'Oct', 'Jun', 'Jul', 'Aug', 'Sep',
     'Dec']
ML = ['Jan', 'Feb', 'Mar', 'Apr', 'May',
      'Jun', 'Jul', 'Aug', 'Sep', 'Oct', 'Nov',
      'Dec']
MD = {'Jan':1, 'Feb':2, 'Mar':3, 'Apr':4,
      'May':5, 'Jun':6, 'Jul':7, 'Aug':8,
      'Sep':9, 'Oct':10, 'Nov':11, 'Dec':12}
```

- a) L.sort(key=lambda x: MD.index(x))
- b) L.sort(key=lambda x: ML[x])
- c) L.sort(key=lambda x: ML.index(x))
- d) L.sort(key=lambda x: MD[x])
- e) L.sort(key=lambda x: L[x])

Sol. 可以按照 ML 這個 list 的 index 或是 MD 這個 dict 的 value 找。

5. Which is not an object in Python 3?

- a) print
- b) str
- c) 'hello'
- d) if
- e) 23

Sol. if、elif 這類判斷符號不是 object。

6. Consider the following class definition:

```
1 class Point:
2     count = 0
3     def __init__(self, x, y):
4         self.x = x
5         self.y = y
6     def move_by(self, dx, dy):
7         self.x += dx
8         self.y += dy
9     m = move_by
10    @property
11    def area_of_box(self):
12        return self.x * self.y
```

and you have

```
>>> p = Point(2, 3)
>>> q = Point(4, 5)
```

Which of the following is equivalent to

```
q.move_by(1, 2)
```

- a) `Point.move_by(q, 1, 2)`
- b) `move_by(q, 1, 2)`
- c) `move_by(self=q, dx=1, dy=2)`
- d) `q = Point.move_by(1, 2)`
- e) `Point.q.move_by(1, 2)`

Sol. 不確定，但印象中應該是這個，可以再看看講義。

7. Continuing with the previous question, which of the following statements or expressions will cause an error?

- a) `q.area_of_box()`
- b) `p.z = 3`
- c) `p.area_of_box`
- d) `p.move_by(3, 4)`
- e) `p.m(1, 2)`

Sol. 因為@property。

8. Referring to the same code as in Problem #7, what is the value of `(p.count, q.count)` after executing the following codes?

```
1 p.count += 1
2 Point.count += 1
3 q.count += 1
```

- a) `(1, 2)`
- b) `(1, 1)`
- c) `(3, 3)`
- d) `(1, 3)`
- e) `(2, 2)`

Sol. `p.count = 0 + 1 = 1`
`q.count = 1 + 1 = 2`
(原因不太清楚但我猜是這樣)

9. What is the output of the code below if input 6 in the first line, please write down the answer in the Q9 box on the Answer Sheet.

```
1 n = int(input())
2 def fib(n):
3     if n < 2:
4         return 1
5     else:
6         return fib(n-1) + fib(n-2)
7 for i in range(2, n):
8     for j in range(1, n):
9         print(fib(i)-(fib(j)*fib(i-j)), end= "")
10    print()
```

Sol.
`0 0 -1 -2 -4`
`1 1 0 -1 -3`
`1 2 1 0 -2`
`2 3 3 2 0`

應該只能慢慢算，看不出有什麼速解法。

10. If you want to read and print lines from a file but skip all blank lines using the following code template

```
1 fh = open('myfile')
2 for line in filter(lambda □, fh.readlines()):
3     print(line, end= '')
4     # the newline is already part of each line
5 fh.close()
```

What should you put as the lambda expression above? Note that a blank line consists of a single newline character. Write your answer in Q10 box on the Answer Sheet.

Sol. `s : s = '\n'` (這個我也不確定)

Python Quiz #6

1. Which of the following is **not** a *recursive data type* in Python? A recursive data type can contain an object of its own type.

- a) dict
- b) list
- c) set
- d) tuple
- e) All of the above types are recursive

Sol. set 裡面不能放 set。

2. What is the value of the code below?

```
list(map(max, [1, 7, 2, 7], [5, 6, 3, 0]))
```

- a) 7
- b) [1, 6, 2, 0]
- c) [1, 7, 2, 7]
- d) [5, 6, 3, 0]
- e) [5, 7, 3, 7]

Sol. 會依照位置順序選比較大的元素。

3. What does the `unknown_function` do?

```
1 def unknown_function(p = '.'):
2     import os
3     if not os.path.isdir(p):
4         return 1
5     unknown_variable = os.listdir(p)
6     return sum(map(unknown_function, unknown_variable))
```

- a) Count the number of files in the current directory.
- b) Count the number of files plus directories recursively.
- c) Count the number of files recursively.
- d) Count the number of directories recursively.
- e) None of the above.

Sol. 下面還有 `subfile` 就繼續往下找，找不到就回傳 1，所以最後會回傳所有的 `file` 的個數有多少個。

4. Which of the following can properly sort a list of month names by month order?

Assuming the following global symbols have been defined.

Choose all that apply.

```
L = ['Apr', 'May', 'Nov', 'Mar', 'Jan',
     'Feb', 'Oct', 'Jun', 'Jul', 'Aug', 'Sep',
     'Dec']
ML = ['Jan', 'Feb', 'Mar', 'Apr', 'May',
      'Jun', 'Jul', 'Aug', 'Sep', 'Oct', 'Nov',
      'Dec']
MD = {'Jan':1, 'Feb':2, 'Mar':3, 'Apr':4,
      'May':5, 'Jun':6, 'Jul':7, 'Aug':8,
      'Sep':9, 'Oct':10, 'Nov':11, 'Dec':12}
```

- f) `L.sort(key=lambda x: MD.index(x))`
- g) `L.sort(key=lambda x: ML[x])`
- h) `L.sort(key=lambda x: ML.index(x))`
- i) `L.sort(key=lambda x: MD[x])`
- j) `L.sort(key=lambda x: L[x])`

Sol. 可以照 `ML` 的 `index`，也可以照 `MD` 的 `value` 排 (差別只在這裡對 `list` 要取他的 `index` 大小，對 `dictionary` 這裡是要取他的 `value` 大小)。

5. Which is **not** an object in Python 3?

- a) `print`
- b) `str`
- c) `'hello'`
- d) `if`
- e) 23

Sol. `if` 這類判斷用的不是(`else elif` 之類的也不是)。

6. Consider the following class definition:

```
1 class Point:
2     count = 0
3     def __init__(self, x, y):
4         self.x = x
5         self.y = y
6     def move_by(self, dx, dy):
7         self.x += dx
8         self.y += dy
9     m = move_by
10    @property
11    def area_of_box(self):
12        return self.x * self.y
```

and you have

```
>>> p = Point(2, 3)
>>> q = Point(4, 5)
```

Which of the following is equivalent to:

```
q.move_by(1, 2)
```

- a) `Point.move_by(q, 1, 2)`
- b) `move_by(q, 1, 2)`
- c) `move_by(self=q, dx=1, dy=2)`
- d) `q = Point.move_by(1, 2)`
- e) `Point.q.move_by(1, 2)`

Sol. 呼叫 class 裡的 method 時的兩種固定用法。

7. Continuing with the previous question, which of the following statements or expressions will cause an error?

- a) `q.area_of_box()`
- b) `p.z = 3`
- c) `p.area_of_box`
- d) `p.move_by(3, 4)`
- e) `p.m(1, 2)`

Sol. 不能有括號(因為@property)。

8. Referring to the same code as in Problem #7, what is the value of (p.count, q.count) after executing the following codes?

```
1 p.count += 1
2 Point.count += 1
3 q.count += 1
```

- a) (1, 2)
- b) (1, 1)
- c) (3, 3)
- d) (1, 3)
- e) (2, 2)

Sol. p 先+=1 後變成 1，之後整個 class 的 count 才+=1 變成 1，加完之後 q 再+=1 變成 2，所以會是(1,2)。

9. What is the output of the code below if input 6 in the first line, please write down the answer in the Q9 box on the Answer Sheet.

```
1 n = int(input())
2 def fib(n):
3     if n < 2:
4         return 1
5     else:
6         return fib(n-1) + fib(n-2)
7 for i in range(2, n):
8     for j in range(1, n):
9         print(fib(i)-(fib(j)*fib(i-j)),
10              end=" ")
10 print()
```

```
1  0  -1  -3  -6
1  1  0  -2  -5
2  1  2  0  -3
3  2  2  3  0
```

Sol. 只能慢慢花時間寫算每個元素的值，偏麻煩。

10. If you want to read and print lines from a file but skip all blank lines using the following code template.

What should you put as the lambda expression above? Note that a blank line consists of a single newline character. Write your answer in the Q10 box on the Answer Sheet.

```
1 fh = open('myfile')
2 for line in filter(lambda □, fh.readlines()):
3     print(line, end='')
4     # the newline is already part of each line
5 fh.close()
```

x: x!= '\n'

Sol. 因為文字檔裡的一個空行用字串表示就是'\n'，所以你的 filter 想要篩選出那一行的長相不是'\n'的東西，用 lambda 表示式就是這樣打。

Python Quiz #7

1. 選不能正確輸出的行。Choose all that apply.

```
1 a = 0
2 b = 1
3 eval(2+3)
4 eval('a'+b)
5 eval('a + 3', {})
6 eval('2+2')
7 eval(sum([8, 16, 32]))
```

- a) 3
- b) 4
- c) 5
- d) 6
- e) 7

Sol. eval()裡面要放 string 表示式，後面如果打括號的話 string 裡的變數就會從括號裡面找，第五行會錯是因為大括號裡面找不到 a 是多少。

2. Refer to the following table. Which of the following statements about operations between two types in **datetime** module is **incorrect**?

	type	op	type	resulting type
a)	timedelta	+	timedelta	timedelta
b)	timedelta	*	int	timedelta
c)	datetime	+	timedelta	datetime
d)	datetime	+	datetime	timedelta
e)	datetime	-	datetime	timedelta

Sol. datetime 不能相加(應該)。

3. After executing the code snippet below, which of the following statements will cause an error?

```
1 from enum import Enum
2 Animal=Enum('Animal',['ANT','BEE','CAT','DOG'])
```

- a) Animal.BEE
- b) Animal(1)
- c) Animal.DOG > Animal.ANT
- d) str(Animal['CAT'])
- e) dir(Animal)

Sol. Enum 不支援比大小(不確定詳細原因)。

4. What is the result of the following code snippet?

```
1 from enum import Enum
2 Shake = Enum('Shake', [('VANILLA', 7), \
3 ('CHOCOLATE', 3), ('COOKIES', 9), ('MINT', 4)])
4 print(Shake(3))
```

- a) Shake.CHOCOLATE
- b) 'MINT'
- c) 'CHOCOLATE'
- d) 4
- e) Shake.MINT

Sol. 會印出 Shake 這個類別裡的 3 號位，所以是 Shake.CHOCOLATE。

5. Which of following character are included in the string.printable? Choose all that apply.

- a) '\t'
- b) '\n'
- c) '!''
- d) 'a'
- e) '0'

Sol. 會包含所有的數字、英文字、標點符號、空白位元等，反正印得出來的東西都在裡面。

```
>>> string.printable
'0123456789abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ!\"#$%&'()*+,-./:;<=>?@[\\]^_`{|}~\t\n\r\x0b\x0c'
```

6. Which of following is Python's builtin functions? Choose all that apply.

- a) eval
- b) abs
- c) import
- d) break
- e) enum

Sol. cd 不是函式，e 是 library 的名字。

7. What is the result of the code snippet below?

```
1 L = [1, 2, 3, 4, 5]
2 max, min = min, max
3 print(min(L), max(L))
```

- a) 5 5
- b) 1 1
- c) 1 5
- d) 5 1
- e) TypeError

Sol. max min 功能交換。

8. What is the result of the code snippet below?

```
from re import findall
1 result = findall(r'.*are', 'He cares that we are scared')
2 print(result)
```

- a) ['He care that we are', ' scare']
- b) []
- c) ['He care']
- d) ['He care', 'that we are', 'scare']
- e) ['He cares that we are scare']

Sol. 會找到最後一個 are，然後把到那邊為止的字串印出來。

9. Which of following character have special meaning Python regular expression (i.e. instead of represent the symbol itself.) **Choose all that apply.**

- a) '#'
- b) '*'
- c) '\''
- d) '!'
- e) '\$'

Sol. 如果要背的話，符合這題的符號大概有：\、^、\$、*、+、?。

10. Please give an example that match the regular expression below.

`^(.)(.)(.){3}2\1$`

範例輸出：**abcdcba**

Sol. 只要是回文的字串都滿足這個表達式(可以看成前面四個字元任意，第五個字元對應到第三個，第六個對應到第二個，第七個對應到第一個)，^跟\$是字串的開始跟結束。

Python Quiz #post test

1. What is the result after executing the following code?

```
1 def moreAndMoreTax(price, rate = 0.5):
2     ans = price * (1 + rate)
3     rate += 0.01
4     return ans
5 price = moreAndMoreTax(30)
6 print('The price is:', price)
```

Assume no other variables are defined globally.

- a) The price is: 45.3
- b) The price is: 45.0
- c) The price is: 30.0
- d) NameError
- e) The price is: 33.3

Sol. $30 * 1.5 = 45$ 。

2. Two tuples: A=(1,3,7,0,5), B=(2,4,10,1,9)

Which of the following results is an integer?

- a) max(**A,**B)
- b) max((A,B))
- c) max(*(A+B))
- d) max(*(A,B))
- e) max(A,B)

Sol. 只有 c 裡面的東西是 unpack 的。

3. Convert the following code into one that uses the with construct:

```
1 fh = open('filename', 'r')
2 print(len(fh.readlines()))
3 fh.close()
```

a)

```
1 with:
2     fh = open('filename', 'r')
3     print(len(fh.readlines()))
```

b)

```
1 with open('filename', 'r') as fh:
2     print(len(fh.readlines()))
```

c)

```
1 fh with open('filename', 'r'):
2     print(len(fh.readlines()))
```

d)

```
1 with fh in open('filename', 'r'):
2     print(len(fh.readlines()))
```

e)

```
1 with fh = open('filename', 'r'):
2     print(len(fh.readlines()))
```

Sol. 固定用法。

4. Which of the following is not iterable?

- a) 'abc'
- b) 0xabcd
- c) {'a':100, 'b':200, 'c':300}
- d) {'a', 'b', 'c'}
- e) range(0xabcd)

Sol. set 不是 iterable(沒有 index 的概念)。

5. Assume x = 1, which of the following expression is invalid?

- a) float(x).__sub__(2.)
- b) float(x).__sub__(2)
- c) 2.__sub__(x)
- d) (2).__sub__(2)
- e) 2.__sub__(x)

Sol. e 的寫法前面的.會被當成 float 所以會報錯。

6. Assume g = fib() is a generator for Fibonacci numbers, and r = iter(deck) is an iterator where deck is an instance of iterable class Deck. Which of the following is not allowed?

- a) next(r)
- b) [i for i in iter(deck)]
- c) x, y, z = fib()
- d) next(g)
- e) list(r)

Sol. 因為數量對不上(左邊三個變數，等號右邊也要有三個東西 assign 過去)。

7. Assume **import re**, what will be returned as the result after executing the following code

```
re.findall('lit', 'Mary had little little lamb')
```

- a) None
- b) 2
- c) ['lit', 'lit']
- d) ['lit']
- e) (9,16)

Sol. 找到兩個，所以結果回傳兩個 lit 的 list。

8. If you want to read and print lines from a file but skip all blank lines using the following code

```
1 fh = open('myfile')
2 for line in filter(lambda□,
    fh.readlines()):
3     print(line, end='')
4 fh.close
```

What should you put as the **lambda** expression above?
Note that a blank line consists of a single newline character.

- a) x:x!= '\n'
- b) x:x in '\n'
- c) x: '\n' in x
- d) x:len(x)!=0
- e) x:x== '\n'

Sol. 同第六次小考最後一題。

9. Assuming the following global symbols have been defined.

```
L = ['Apr', 'May', 'Nov', 'Mar', 'Jan',
'Feb', 'Oct', 'Jun', 'Jul', 'Aug', 'Sep',
'Dec']
ML = ['Jan', 'Feb', 'Mar', 'Apr', 'May',
'Jun', 'Jul', 'Aug', 'Sep', 'Oct', 'Nov',
'Dec']
MD = {'Jan':1, 'Feb':2, 'Mar':3, 'Apr':4,
'May':5, 'Jun':6, 'Jul':7, 'Aug':8,
'Sep':9, 'Oct':10, 'Nov':11, 'Dec':12}
```

Which of the following can properly sort a list of month names by month order? **Choose all that apply.**

- a) L.sort(key=lambda x: MD[x])
- b) L.sort(key=ML)
- c) L.sort(key=lambda x: ML[x])
- d) L.sort(key=lambda x: MD.index(x))
- e) L.sort(key=lambda x: ML.index(x))

Sol. 可以照 ML 的 index，也可以照 MD 的 value 排 (差別只在這裡對 list 要取他的 index 大小，對 dictionary 這裡是要取他的 value 大小)

10. What does the unknown_function do?

```
1 def unknown_function(p = '.'):
2     import os
3     if not os.path.isdir(p):
4         return 1
5     unknown_variable = os.listdir(p)
6     return sum(map(unknown_function, unknown_variable))
```

- a) Returns the total length of file names recursively in the current directory
- b) Return the deepest number of levels of directories contained in the current directory.
- c) Counts the number of files plus directories recursively in the current directory.
- d) Counts the number of files recursively in the current directories
- e) Count the number of directories recursively in current directory.

Sol. 見第六次小考第三題。