

Quiz #1

1. Calculate the following.

(1) The roots of the quadratic equation $ax^2 + bx + c = 0$ is $\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$. Find the roots when $a = 2, b = -1, c = -15$.

(2) Consider the Normal pdf function $f(x; \mu, \sigma^2) = \frac{1}{\sqrt{2\pi}\sigma} \exp\left\{-\frac{(x-\mu)^2}{2\sigma^2}\right\}$ with the parameters $\mu = 2, \sigma^2 = 3$. What is the value of $f(x = 1)$.

2. Briefly explain why the error occurs in the following expression.

(1)

```
>>> a = input("enter a number:")
```

```
enter a number:5
```

```
>>> a+3
```

(2)

```
>>> tmp = 'My String'
```

```
>>> tmp[10]
```

(3)

```
>>> ex1 = 'sample string'
```

```
>>> ex2 = ex1.upper
```

```
>>> ex2[:4]
```

3. Create the following string object 'grade'.

```
grade='ABCDF'
```

(1) Using the '+' operator on 'grade', create 'grade_str' as follows.

```
>> grade_str  
  
'ABCDFFDCBA'
```

- (2) Count the number of 'A' in 'grade_str'.
- (3) Present 4 different slicing expression to extract 'FFF' in 'grade_str'.
- (4) Modify 'grade_str' in (3) as the following.

```
>> grade_str  
  
ABCDAAADCBA
```

- (5) Change all letters of 'grade_str' to lower case.

4. Briefly explain why the error occurs in the following expression.

- (1)

```
>>> L = [[1,3,5,7,9], [2,4,6,8,10]]  
  
>>> L[0][1:2]=30
```
- (2)

```
>>> T=(10, 20, 30)  
  
>>> T[:2]+(40)
```
- (3)

```
>>> D = {'A':10, 'B':20, 'C':30}  
  
>>> D2=D  
  
>>> del D2['A']  
  
>>> D['A']
```
- (4)

```
>>> D3={('Park','male'):30, ('Lee','female'):28, ('Kim','male'):34 }
```
- (5)

```
>>> dict_y = { (1,) : 10, (2,) : 20, (3, ) : 30, (4, ) : 40 }  
  
>>> dict_y[ -2 : ]
```

5. Create the following list object 'days'.

```
days = ['Mon', 'Tues', 'Wed', 'Thur', 'Fri', ['Sat', 'Sun']]
```

- (1) Extract elements from 'days' as shown below.

- ① [['Sat', 'Sun']]
- ② [['Sat', 'Sun'], 'Thur', 'Tues']
- ③ 'Sat'

(2) Modify 'days' as shown below by applying the slicing (:) and concatenation operator (+) and name it 'days2'.

```
>>> days2  
  
[['Mon', 'Tues', 'Wed', 'Thur', 'Fri'], 'Sat', 'Sun']
```

(3) Modify 'days2' in (2) as follows, by removing the 2 items 'Wed' and 'Fri'.

```
>> days2  
  
[['Mon', 'Tues', 'Thur'], 'Sat', 'Sun']
```

(4) Modify 'days2' in (3) as follows, by inserting 'W' at the given position.

```
>> days2  
  
[['Mon', 'Tues', 'W', 'Thur'], 'Sat', 'Sun']
```

6. Create the following list object 'Nums'.

```
Nums=[1, 5, 2, 7, 3, 6, 4]
```

(1) Appends the largest element of 'Nums' to the end of 'Nums'.

```
>> Nums  
  
[1, 5, 2, 7, 3, 6, 4, 7]
```

(2) Sort the elements in 'Nums' in decreasing order.

```
>> Nums  
  
[7, 7, 6, 5, 4, 3, 2, 1]
```

- (3) Modify the 'Nums' in (2) as the following. (Replace the 1st, 3rd, 5th and 7th elements in 'Nums' with 'a'.)

```
>> Nums  
  
['a', 7, 'a', 5, 'a', 3, 'a', 1]
```

7. Create the following tuple object 'price'.

```
price = (180, 130, 110, 160, 140, 170)
```

- (1) Sort the items of 'price' in ascending order so that 'price' is displayed as below.

```
>> price  
  
(110, 130, 140, 160, 170, 180)
```

- (2) Write a code that returns True if 'price' has the value 170 and False otherwise.
- (3) Insert 3 zeros instead of 5th value 160 in 'price', so that 'price' is displayed as below.

```
>> price  
  
(110, 130, 140, 160, 0, 0, 0, 180)
```