

## Python Data Science Homework #1

**NOTICE: PRINT OUT THE ANSWERS DIRECTLY WILL NOT BE SCORED.**

1. Please create a list, tuple, dictionary and set as variables respectively, and print them out in the following format. (10%)

Ex:

```
['a', 'b', 'c'] is a <class 'list'>
('a', 'b', 'c') is a <class 'tuple'>
{1: 'a', 2: 'b', 3: 'c'} is a <class 'dict'>
{'b', 'c', 'a'} is a <class 'set'>
```

2. Please calculate the area of a circle with a radius of 10 and print it out in the following format. (10%)

Output:

```
The area of the circle with radius 10 is 314.15!
```

3. `file = 'abc.jpg'`

Please print the file extension in the following format. (10%)

Output:

```
The extension of the file is: jpg
```

4. Set A contains 'N','C','T','U', and set B contains 'N','Y','C','U'. Please find the same elements in both sets. (10%)

5. `participant = 'M M F M F M M M M F F M M M F M M M'`

M and F represents male and female, respectively. Please print out the number of males, females and all participants. (the number of \* equals to the number of people). Then, if participants are asked to divided into groups (in groups of two), please calculate the number of groups and the remaining number of people. Print out the result in the following format. (15%)

Output:

```
Number of Male: 14 *****
Number of Female: 5 *****
Number of all participant: 19
In groups of two, we get 9 groups and 1 person is left.
```

6. `weekdays = ['SATurday', 'fRiday', 'tHuRsdAY', 'wEdnesdaY', 'TueSday', 'moNdaY', 'sUnDay']`

Please perform some process to convert the list (`weekdays`) into the following format. (15%)

Output:

```
Sun Mon Tues Wednes Thurs Fri Satur
```

- HINT: 1. Change the order of the original list (`weekdays`).  
2. Convert list (`weekdays`) to a string.  
3. Do string manipulations.

7. `list_1 = [(2, 'c'), (1, 'a'), (4, 'b'), (2, 'e'), (2, 'd')]`  
`list_2 = [(2, 'f'), (1, 'g')]`

Perform the following steps: (15%)

- I. change (4, 'b') in `list_1` to (5, 'b')
- II. remove (2, 'd') in `list_1`
- III. combine `list_1` and `list_2`
- IV. print the results sorted by the second element of the tuple in reverse order

Output:

```
[(1, 'g'), (2, 'f'), (2, 'e'), (2, 'c'), (5, 'b'), (1, 'a')]
```

8. `phonebook = {'NCTU': '03 571 2121', 'NTHU': '03 571 5131', 'NCCU': '02 2939 3091', 'NCKU': '06 275 7575', 'NTU': '02 3366 5022'}`

Please change the school name of NCTU to NYCU and print the result. (15%)

Output:

```
The phobe number of NTHU is 03 571 5131.
The phobe number of NCCU is 02 2939 3091.
The phobe number of NCKU is 06 275 7575.
The phobe number of NTU is 02 3366 5022.
The phobe number of NYCU is 03 571 2121.
```