Data Structures p.I
Lists & Tuples

Exercises

Level - Easy

Exercise 1-1

1. Create a list named fruits containing the following items: "apple", "banana", "cherry".
2. Print the list to ensure it has been created correctly.
3. Create a tuple named vegetables containing the items: "carrot", "broccoli", "lettuce".
4. Print the tuple.

Exercise 1-2

1. Given a list named colors that contains "red", "blue", "green", "yellow" and "pink"
2. Print the second and fourth items from the list.
3. Given the tuple named grades that contains "A", "B", "C", "D" and "F"
4. Print the first and last items from the tuple.

Exercise 1-3

1. Given a list named days that contains "Monday", "Tuesday", "Wendesday", "Thursday" and "Friday".
2. Correct the typo in "Wendesday" to "Wednesday" using the days list.
3. Print the list to ensure the change has been made.

Exercise 1-4

1. Given a list named animals that contains "cat", "dog" and “apple”
2. Remove the “apple” from the list.
3. Print the list.
4. Add "rabbit" to the list.
5. Print the list.

Exercise 1-5

1. Given a tuple named months that contains "Jan", "Feb", "Mach” and "Apr"
2. Try to correct the typo in "Mach" to "March".
3. What happens?
4. Convert the tuple into a list.
5. Retry to correct the typo in "Mach" to "March".
6. Convert the list into a tuple.
7. Print the tuple.

Exercise 1-6

1. Create a list named fishes that contains “catfish”, “perch”, “cod” and “carp”
2. Show the last element of the list using two different ways.
3. Change the second element of the list by another fish name.
4. Print the modified list.

Exercise 1-7

1. Create a tuple that contains 0, 0, 1, 0, 1, and 1
2. Count the number of 0 using a method.
3. Find the index of the first 1 using a method.
4. Delete the tuple.

Tips: To delete a tuple, you could use del followed by the tuple name.

Exercise 1-8

1. Create a list named first_list that contains 0, 1, 2, 3 and 4.
2. Create a new list named copy_list by doing copy_list = first_list.
3. Modify the last element of copy_list.
4. Print first_list.
5. What happened ?
6. Find a way to correctly copy the first_list.

Level - Moderate

Exercise 2-1

1. Create a list named integers that contains 0, 1 and 3.
2. Add the number 4 to the end of the list using two different methods.
3. Add the number 2 in the list at the correct index to get a sequence.
4. Print the list, it should display 0, 1, 2, 3, 4.
5. Create a new list that contains 5, 6, 7 and 8.
6. Add this new list at the end of the integers list.
7. Remove the number 0 from the list.

Exercise 2-2

1. Create a list named floats that contains 1.1, 2.2, 3.3, 4.4, 5.5, 6.6, 7.7 and 8.8
2. Use slicing to get the elements 2.2, 3.3 and 4.4 in one operation.
3. Use slicing to get the elements from 3.3 to the end of the list.
4. Use slicing to get the elements from the start of the list to 5.5 included.
5. Use slicing to reverse the list.

Exercise 2-3

1. Create a list named mylist that contains ‘abc’, False, 1 and 3.14159.
2. Change False and 1 to True and 0 in one operation.
3. Extract the element ‘abc’ from the list and assign it to a variable in one operation.
4. Print that variable.
5. Assign the 3 list elements into 3 variables in one operation.
6. Print these variables.

Exercise 2-4

You can’t use any loop for this exercise.

1. Create a list named numbers that contains 3, 4, 5, 1 and 2.
2. Ask the user to input a number.
3. Compare the user's number to the maximum of the list.
4. Print whether it is higher or lower than the maximum of the list.
5. Do the same using another method.

Exercise 2-5

1. Create a list named sports that contains "Football", "Basketball", "Swimming" and "Tennis".
2. Ask the user for their favorite sport.
3. Print "We love that too!" if the user's favorite sport is in the list.

Level - Hard

Exercise 3-1

1. Ask the user to provide three numerical inputs.
2. Create a tuple out of them.
3. If the sum of the first and second elements of the tuple is greater than the third, print the tuple in reverse.
4. Otherwise, print the tuple normally.

Exercise 3-2

1. Create a list named values that contains 1, 2, 3, 4, 5, 6, 7, 8, 9 and 10.
2. Slice the list such that you get every second element starting from the end, but not including the last element.
3. Print the result (it should be 9, 7, 5, 3, 1).

Exercise 3-3

1. Create a list named matrix that contains:

1	2	3
4	5	6
7	8	9

2. Print the element 8.
3. Print the second row of the matrix, i.e. 4, 5 and 6.
4. Print the third column of the matrix, i.e. 3, 6 and 9.
5. Print the diagonal of the matrix, i.e., 1, 5 and 9.

Exercise 3-4

1. Create 3 lists :
    a. [0,1]
    b. [‘on’, ‘off’]
    c. [True, False]
2. Using only these 3 lists create the following tuple by combining them :

```
([0,1, (1,0)],
 (‘on’, ‘off’),
 [[‘off’, ‘on’, True, False],
  [True, False]])
```