D002 Python for Everyone

Lesson 3: String and List

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What we have covered so far

- Variables
- Basic Operation `= + - * / ** %`
- Comparison symbol `== != > < >= <=`
- Logical Operator `and or not`
- Branching `if` `if else` `if elfi elfi elfi else`
- Loop `while` `for`

Warm up exercise

Open Q1.py and write one line of code for each of the subquestions.

Each character of a String

This is how we add the string

```
name = "Kevin"
did = "did"
it = "it"
space = " "
sentence = name + space + did + space + it
```

If I want to get individual character of a string, we use `[]`

```
print(sentence[0])  # K
print(sentence[1])  # e
print(sentence[5])  #  (space)
print(sentence[6])  # d
```

0	1	2	3	4	5	6	7	8	9	10	11
K	e	v	i	n		d	i	d		i	t

Index

Technically, we call the number inside `[]` -- **Index**.
An index always starts with 0.

The index cannot excess the length of the string.
`sentence[12]` is undefined.

But we do allow negative index

0	1	2	3	4	5	6	7	8	9	10	11
K	e	v	i	n		d	i	d		i	t
-12	-11	-10	-9	-8	-7	-6	-5	-4	-3	-2	-1

`sentence[-13]` is also undefined.

Example

```
index = 0
sentence = "Kevin did it"
reverse = ""
while index < len(sentence):   #len - length of the string
        reverse = sentence[index] + reverse
print(reverse)
```

> ti did niveK

Same result as

```
sentence = "Kevin did it"
reverse = ""
for i in sentence:
    reverse = i + reverse
print(reverse)
```

Slicing

We can also use `sentence[0:3]` to slice the string from position 0 to 2.

```
sentence = "Kevin did it"
print(sentence[0:3])
print(sentence[1:8])
```

```
Kev
evin di
```

0	1	2	3	4	5	6	7	8	9	10	11
K	e	v	i	n		d	i	d		i	t

List

We saw list in lesson 2 already.
A list can be

```
a = [1, 2, 3, 5, 9]
b = ['apple', 'banana', 'orange']
```

Similar to a string, we can refer to a particular element in a list by index

```
print(a[1])  # 2
print(b[0])  # apple
```

Adding element into a list

```python
a = [1,2,3]
a = a + [4]   # [4] is a list with one element
print(a)
```

```
[1, 2, 3, 4]
```

Or we can use `append`

```python
a.append(8)
print(a)
```

```
[1, 2, 3, 4, 8]
```

A list of string

```python
b = ['apple', 'orange', 'banana']
```

0	1	2
apple	orange	banana

```python
print(b[0])
print(b[0][0:2])
```

```
apple
ap
```

List is editable with index

```python
b = ['apple', 'orange', 'banana']
b[1] = 'pear'
print(b)
```

> ['apple', 'pear', 'banana']

But string is not editable with index

List also support slicing

```
a = [1,2,3,4,5]
c = a[0:3]   # c is also a list after slicing
print(c)
```

```
[1, 2, 3]
```

Example of using List

```
list = []
for i in range(0, 4):
    height = int(input("Enter your height: "))
    if i != 3:
        print("Next", end=",")
    list.append(height)
max = list[0]
for i in list:
    if i > max:
        max = i
print("The tallest has %d cm" % max)
```

Another example of using list

Record the result of the sum of two dices

```
from random import randint
list = [0,0,0,0,0,0,0,0,0,0,0,0,0]
for i in range(0, 1000):
        x = randint(1,6) + randint(1, 6)
        list[x] = list[x] + 1
print(list[2:13])  # print the bins from 2 to 12
```

Q2

Create a list `L` that contains “Apple”, “Orange”, “Banana”, “Pear”, “Melon”
Print the first three fruits from `L` using slicing
Add “Strawberry” at the end of `L`

Q3

Write a program to ask the user enter 10 words. The program will keep the words starts with A E I O U into a list.

Other List operation - Insert

```python
a = [1,2,3]
a.insert(1, 10)  # insert at position 1, with the value 10
print(a)
```

```
[1, 10, 2, 3]
```

Other List operation - Pop

pop is to remove an element from a list with the given index.

```python
b = ["apple", "orange", "banana"]
b.pop(1)
print(b)
```

> ['apple', 'banana']

Other List operation - Remove

remove is to erase the first appearance of the element

```
a = [100,200,300,400,100,200,300,400]
a.remove(400)
print(a)
```

```
[100, 200, 300, 100, 200, 300, 400]
```

Other List operation - in

in can be used in two situations:

1. for loop

```
list = [1,3,5,7]
for i in list:
    print(i)
```

2. check if is containing

```
secret_word = "banana"
guess = input("Input a letter")
if guess in secret_word:
   print("My secret word has the letter %s" % guess)
else:
   print("Guess again")
```

Please work on L2 Q5 and Q6.

Oh. if you have free time, may be we can think about how to work on a hangman program 😄