

#The Python Programming Language : Funtions

In [17]:

```
def add_numbers(x, y):    #def 함수 정의
    return x + y

add_numbers(1, 2)    #shift+enter 아웃풋 출력
```

Out[17]:

3

In [18]:

```
def add_numbers(x, y, z = None):
    if(z == None):
        return x + y
    else:
        return x + y + z

print(add_numbers(1, 2))
print(add_numbers(1, 2, 3))
```

3

6

#The Python Programming Language: Types and Sequences

In [19]:

```
type('This is a string')
```

Out[19]:

str

In [20]:

```
type(None)
```

Out[20]:

NoneType

In [21]:

```
type(1)
```

Out[21]:

int

In [22]:

```
type(1.0)
```

Out[22]:

float

In [23]:

```
type(add_numbers)
```

Out[23]:

function

In [24]:

```
x = (1, 'a', 2, 'b')
```

In [25]:

```
type(x)
```

Out[25]:

tuple

In [26]:

```
x = [1, 'a', 2, 'b']  
type(x)
```

Out[26]:

list

In [27]:

```
x.append(3.3)  
print(x)
```

[1, 'a', 2, 'b', 3.3]

In [28]:

```
for item in x:  
    print(item)
```

1
a
2
b
3.3

In [29]:

```
i = 0
while(i != len(x)):
    print(x[i])
    i = i + 1
```

```
1
a
2
b
3.3
```

In [30]:

```
x + [3, 4]
```

Out[30]:

```
[1, 'a', 2, 'b', 3.3, 3, 4]
```

In [31]:

```
[1] * 3    #리스트 [1] 에 [1]을 더하고 [1]을 더함
```

Out[31]:

```
[1, 1, 1]
```

In [32]:

```
1 in x
```

Out[32]:

```
True
```

In [34]:

```
x = 'This is a string'
print(x[0])
```

```
T
```

In [36]:

```
print(x[0:1])    #0부터 1
print(x[0:2])    #0부터 2 까지
```

```
T
Th
```

In [37]:

```
x[-1]
x[-4:-2]    #끝에서부터
```

Out[37]:

```
'r i'
```

In [38]:

```
x[-1]
```

Out[38]:

```
'g'
```

In [39]:

```
x
```

Out[39]:

```
'This is a string'
```

In [40]:

```
x[:3] #앞에서 3개 출력
```

Out[40]:

```
'Thi'
```

In [41]:

```
x[3:] #3번째꺼부터 끝까지
```

Out[41]:

```
's is a string'
```

In [42]:

```
x + '.'
```

Out[42]:

```
'This is a string.'
```

In [43]:

```
x + 3
```

```
-----  
-  
TypeError                                Traceback (most recent call last)  
<ipython-input-43-d82f0f28ad97> in <module>  
----> 1 x + 3
```

```
TypeError: can only concatenate str (not "int") to str
```

In [44]:

```
x + '3'
```

Out[44]:

```
'This is a string3'
```

In [50]:

```
x = {'Chris': 'chris@smu.ac.kr', 'ksshin': 'kssin@smu.ac.kr'} #딕셔너리 변수형
```

In [51]:

```
x['Chris']
```

Out[51]:

```
'chris@smu.ac.kr'
```

In [52]:

```
for name in x: #name이 key 값  
    print(x[name])
```

```
chris@smu.ac.kr  
kssin@smu.ac.kr
```

In [53]:

```
for email in x.values():  
    print(email)
```

```
chris@smu.ac.kr  
kssin@smu.ac.kr
```

In [54]:

```
for name, email in x.items():  
    print(name)  
    print(email)
```

```
Chris  
chris@smu.ac.kr  
ksshin  
kssin@smu.ac.kr
```