Python

Data engineering and mobile computing LAB
Sangkeun Kim

TEST 환경

- Ubuntu 14.04.2 LTS

- python 2.7.6

  - python 3.0?

- virtualenv

시작하기

```
sisobus@mclab29:~$ python

Python 2.7.6 (default, Jun 22 2015, 17:58:13)

[GCC 4.8.2] on linux2

Type "help", "copyright", "credits" or "license" for
more information.

>>>
```

```
sisobus@mclab29:~$ python a.py
```

첫째줄

```
#!/usr/bin/python
```

\# 은 python 주석을 의미한다.

python 으로 해당 .py파일을 실행할 때

/usr/bin/python 에 있는 python으로 실행함을 의미함

입력과 출력

```python
#!/usr/bin/python
import sys
a = int(sys.stdin.read())
print a
```

```cpp
#include <cstdio>
int main() {
    int a;
    scanf("%d",&a);
    printf("%d\n",a);
    return 0;
}
```

입력과 출력

```python
#!/usr/bin/python
import sys
a = sys.stdin.readline()
print a
```

```cpp
#include <cstdio>
int main() {
    char s[111];
    gets(s);
    printf("%s\n",s);
    return 0;
}
```

함수

```python
#!/usr/bin/python
def f(a):
    return a+5
print f(10)
```

```cpp
#include <cstdio>
int f(int a) {
    return a + 5;
}
int main() {
    printf("%d\n",f(10));
    return 0;
}
```

만약에

```python
#!/usr/bin/python
def f(a):
    if a >= 10:
        return a - 5
    elif a < 10:
        return a + 5
    else :
        return a
print f(10)
```

```cpp
#include <cstdio>
int f(int a) {
    if ( a >= 10 ) {
        return a - 5;
    } else if ( a < 10 ) {
        return a + 5;
    } else {
        return a + 5;
    }
}
int main() {
    printf("%d\n",f(10));
    return 0;
}
```

만약에

```python
#!/usr/bin/python
def f(a):
    if a >= 10 and a < 20:
        return a + 5
    elif a < 10 or a >= 20:
        return a - 5
print f(10)
```

```cpp
#include <cstdio>
int f(int a) {
    if ( a >= 10 && a < 20 ) {
        return a + 5;
    } else if ( a < 10 || a >= 20 ) {
        return a - 5;
    }
}
int main() {
    printf("%d\n",f(10));
    return 0;
}
```

만약에

```python
#!/usr/bin/python
if 'c' in 'sangkeun':
    print 'ok'
elif not 'c' in 'sangkeun':
    print 'nop'
```

```
nop
```

동안

```python
#!/usr/bin/python
for i in xrange(0,10,1):
    print i
```

```cpp
#include <cstdio>
int main() {
    for ( int i = 0 ; i < 10 ; i+= 1 )
        printf("%d\n",i);
    return 0;
}
```

동안

```python
#!/usr/bin/python
for i in xrange(10):
    print i
```

```cpp
#include <cstdio>
int main() {
    for ( int i = 0 ; i < 10 ; i+= 1 )
        printf("%d\n",i);
    return 0;
}
```

소수 판단 함수 만들기

```python
#!/usr/bin/python
def f(a):
    if a <= 1: return 0
    for i in xrange(2,a,1):
        if a % i == 0:
            return 0
    return 1
print f(7)
```

```cpp
#include <cstdio>
int f(int a) {
    if ( a <= 1 ) return 0;
    for ( int i = 2 ; i*i <= a ; i++ )
        if ( a % i == 0 ) return 0;
    return 1;
}
int main() {
    printf("%d\n",f(7));
    return 0;
}
```

소수 판단 함수 만들기

```python
#!/usr/bin/python
def f(n):
    return all([(n%j) for j in range(2, int(n**0.5)+1)]) and n>1
print f(7)
```

```cpp
#include <cstdio>
int f(int a) {
    if ( a <= 1 ) return 0;
    for ( int i = 2 ; i*i <= a ; i++ )
        if ( a % i == 0 ) return 0;
    return 1;
}
int main() {
    printf("%d\n",f(7));
    return 0;
}
```

자료형

Number, String, Boolean,
List, Dictionary, Set,
Tuple, File, Type, None

int, string, bool,
list<type>, map<key,value>, set<type>
tuple<int,char>, FILE

Number

```python
#!/usr/bin/python
a = 123 + 222
b = 1.5 * 4
c = 2**10
print a,b,c
```

```cpp
#include <cstdio>
int main() {
    int a = 123+222;
    float b = 1.5*4;
    int c = (1<<10);
    printf("%d %f %d\n",a,b,c);
    return 0;
}
```

String

```python
#!/usr/bin/python
s = 'Sangkeun'
print len(s)
print s[0],s[5],s[-1],s[-2]
```

```cpp
#include <cstdio>
#include <string>
int main() {
    std::string s = "sangkeun";
    int len = (int)s.length();
    printf("%d\n",len);
    printf("%c %c %c %c\n",s[0],s[5],s[len-1],s[len-2]);
    return 0;
}
```

String

```
#!/usr/bin/python
s = 'Sangkeun'
print s[1:3],s[1:]
print s[0:3],s[:2]
print s[:-1],s[:]
```

```
an angkeun
San Sa
Sangkeu Sangkeun
```

String

```python
#!/usr/bin/python
s = 'Sangkeun'
print s[1:3:1]
print s[::2]
print s[::-1]
```

```
an
Snku
nuekgnaS
```

String

```python
#!/usr/bin/python
s = 'Sangkeun'
print s+'Kim'
print s*8
# s[0] = 'K'
print 'S' + s[1:]
```

```
SangkeunKim
SangkeunSangkeunSangkeunSangkeunSangkeunSang
keunSangkeunSangkeun
Sangkeun
```

String

```python
#!/usr/bin/python
s = 'sangkeun'
print s.find('ng')
print s.replace('ng','XX')
print s
```

```
2
saXXkeun
sangkeun
```

String

```python
#!/usr/bin/python
s = 'aaa,bbb,ccc,ddd'
print s.split(',')
s = 'aaa,bbb,ccc,ddd \n'
print s.strip()
```

```
['aaa', 'bbb', 'ccc', 'ddd']
aaa,bbb,ccc,ddd
```

String

```python
#!/usr/bin/python
s = 'sangkeun'
a = 26
print 'name: %s, age: %d'%(s,a)
```

```
name: sangkeun, age: 26
```

한글

```python
#!/usr/bin/python
s = '한글'
print s
s = u'한글'
print s
```

```
  File "g.py", line 2
SyntaxError: Non-ASCII character '\xed' in
file g.py on line 2, but no encoding
declared; see http://python.org/dev/peps/
pep-0263/ for details
```

한글

```python
#!/usr/bin/python
#-*- coding:utf-8 -*-
s = '한글'
print s
s = u'한글'
print s
```

한글
한글

리스트

```python
#!/usr/bin/python
l = [1,2,3,4,5]
print l
print len(l)
print l[0]
print l[1]
```

```cpp
#include <cstdio>
#include <list>
int main() {
    std::list<int> l = {1,2,3,4,5};
    std::list<int>::iterator it=l.begin();
    printf("%d\n",(int)l.size());
    printf("%d\n%d\n",*(it++),*(it));
    return 0;
}
```

리스트

```python
#!/usr/bin/python
l = [1,'123',3,[1,2,3,4,5],5]
print l + [9,8,7]
print l * 2
l.append('hihi')
l.sort()
print l
```

```
[1, '123', 3, [1, 2, 3, 4, 5], 5, 9, 8, 7]
[1, '123', 3, [1, 2, 3, 4, 5], 5, 1, '123',
3, [1, 2, 3, 4, 5], 5]
[1, 3, 5, [1, 2, 3, 4, 5], '123', 'hihi']
```

동안 한번 더!

```python
#!/usr/bin/python
l = []
for i in xrange(10):
    l.append(i)
print l
l.sort()
l.reverse()
print l
```

```
[0, 1, 2, 3, 4, 5, 6, 7, 8, 9]
[9, 8, 7, 6, 5, 4, 3, 2, 1, 0]
```

동안 한번 더!

```python
#!/usr/bin/python
l = []
for i in xrange(10):
    l.append(i)
for item in l:
    print item,
print ''
```

```
0 1 2 3 4 5 6 7 8 9
```

동안 한번 더!

```python
#!/usr/bin/python
l = [ i for i in xrange(10) ]
print l
l = [ 'x' for i in xrange(10) ]
print l
```

```
[0, 1, 2, 3, 4, 5, 6, 7, 8, 9]
['x', 'x', 'x', 'x', 'x', 'x', 'x', 'x', 'x', 'x']
```

2차원 리스트

```python
#!/usr/bin/python
l = [ [] for i in xrange(10) ]
print l
l = [ [ 0 for j in xrange(10) ] for i in
xrange(5) ]
print l
```

```
[[], [], [], [], [], [], [], [], [], []]
[[0, 0, 0, 0, 0, 0, 0, 0, 0, 0], [0, 0, 0, 0, 0,
0, 0, 0, 0, 0], [0, 0, 0, 0, 0, 0, 0, 0, 0, 0],
[0, 0, 0, 0, 0, 0, 0, 0, 0, 0], [0, 0, 0, 0, 0, 0,
0, 0, 0, 0]]
```

사전

```python
#!/usr/bin/python
d = {}
d['sangkeun'] = 26
d['ahn'] = 25
d['sehee'] = 25
print d['sangkeun'],d['ahn'],d['sehee']
```

```cpp
#include <cstdio>
#include <map>
#include <string>
int main() {
    std::map<std::string,int> d;
    d["sangkeun"] = 26;
    d["ahn"] = 25;
    d["sehee"] = 25;
    printf("%d %d %d\n",d["sangkeun"],d["ahn"],d["sehee"]);
    return 0;
}
```

사전

```python
#!/usr/bin/python
d = {
    'key1': 123,
    'key2': 'string',
    'sangkeun': 'kim'
        }
print d
d['add_key'] = 'added_value'
print d
```

```
{'key2': 'string', 'key1': 123, 'sangkeun': 'kim'}
{'key2': 'string', 'key1': 123, 'sangkeun': 'kim',
'add_key': 'added_value'}
```

사전

```python
#!/usr/bin/python
d = {
    'key1': 123
        }
if 'key1' in d:
    print d['key1']
print d['key1'] if 'key1' in d else 0
print d['key2'] if 'key2' in d else 0
```

```
123
123
0
```

집합

```python
#!/usr/bin/python
s = set()
for i in xrange(10):
    s.add(i)
print s
for i in xrange(10):
    s.add(99)
print s
```

```
set([0, 1, 2, 3, 4, 5, 6, 7, 8, 9])
set([0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 99])
```

집합

```python
#!/usr/bin/python
s = set()
for i in xrange(10):
    s.add(i)
print s
for i in xrange(10):
    s.add(99)
print s
```

```cpp
#include <cstdio>
#include <set>
int main() {
    std::set<int> s;
    for ( int i = 0 ; i < 10 ; i++ )
        s.insert(i);
    for ( int i = 0 ; i < 10 ; i++ )
        s.insert(99);
    for ( std::set<int>::iterator it=s.begin();it!=s.end();it++)
        printf("%d ",*it);
    return 0;
}
```

집합

```python
#!/usr/bin/python
l = [1,1,1,1,2,2,3,3,4,5,6]
only_one = set(l)
l = list(only_one)
print l
```

```
[1, 2, 3, 4, 5, 6]
```

파일

```python
#!/usr/bin/python
fp = open('out.txt','w')
fp.write('Hello\n')
fp.write('World\n')
fp.close()
```

```python
#!/usr/bin/python
fp = open('out.txt','r')
s = fp.read()
print s
fp.close()
```

파일 (With)

```python
#!/usr/bin/python
with open('out.txt','r') as fp:
    r = fp.read()
with open('out.txt','r') as fp:
    lines = fp.read().rstrip().split('\n')
for line in lines:
    print line
```

```
Hello
World
```

Boolean

```python
#!/usr/bin/python
a = True
b = False
if a:
    print 'TRUE'
```

```cpp
#include <cstdio>
int main() {
    bool a = true;
    bool b = false;
    if ( a ) puts("TRUE");
    return 0;
}
```

None

```python
#!/usr/bin/python
print None
```

```
None
```

주석

```python
#!/usr/bin/python
# hi
'''
    data engineering and
    mobile computing LAB
    Sangkeun Kim
    QnA ?
'''
```

```cpp
#include <cstdio>
int main() {
    // hi
    /*
     *  data engineering and
     *  mobile computing LAB
     *  Sangkeun Kim
     *  QnA ?
     */
    return 0;
}
```

Quiz!

posts.txt 에 아래와 같은 내용이 있다. 장소, 날짜, 태그를 뽑아내려면 어떻게 해야 할까?

영등포 | 2015-10-31
#[타임 스퀘어] #[스무디 킹] #[우리] #[내] #[도발] #[하지말기] #[한 꿋씩 어긋난 기억] #[미운 상근] #[오리 상근] #[하지만 백조] #[저건 쓰면 안되겠다] #[태그는 여기서 마치겠습니다] #[하하하]

Quiz!

```python
#!/usr/bin/python
#-*- coding:utf-8 -*-
with open('posts.txt','r') as fp:
    lines = fp.read().rstrip().split('\n')
pos = lines[0].split('|')[0].rstrip().lstrip()
time = lines[0].split('|')[1].lstrip().rstrip()
tags = lines[1].split('#')[1:]
only_tags = []
for tag in tags:
    cur = tag.split('[')[-1].split(']')[0]
    only_tags.append(cur)
print pos,time
for only_tag in only_tags:
    print only_tag,
```