

# Fastcampus Sprint - Programming

## Day 2. 파이썬 핵심문법 이해하기

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# Python

## 특징

- 인터프리터
- 객체지향
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- 엄격한 문법

## C vs Python

```
int main(){  
    int num;  
    for(i=0;i<=10;i++){  
        if (i % 2 == 0){  
            printf(i);  
        }  
    }  
}
```

```
for i in range(1,10+1):  
    if i % 2 == 0:  
        print(i)
```

# Numbers & Math

<object> <operator> <object>

```
print(3 + 7)
print(10 - 3)
print(15 / 7)
print(34 * 100)
```

# Numbers & Math

```
print(15 / 7)
print(15 / 5)
type(15 / 5)

print(15 // 5)
type(15 // 5)

print(7 % 3)

print(15 ** 3)

print(34 * 100)
print(3 * 2.5)
type(3 * 2.5)
```

# Boolean

```
print(3 < 7)
print(10 < 3)
print(15 > 7)
print(3 >= 3)
print(3 <= 10)
print(34 == 100)
print(34 != 100)
```



# Variable

```
print("hello python!")  
hello = "hello"  
python = "python!"  
print(hello, python)
```

```
num1 = 14  
num2 = 5  
  
print(num1+num2)  
print(num1-num2)  
print(num1*num2)  
print(num1/num2)
```

# Let's Code PYTHONIC

## Variables

- `_variable` : 내부적으로 사용되는 변수
- `print_` : 파이썬 키워드와 충돌 방지
- 클래스 이름은 `CamelCase`
- 함수, 변수, 메소드 이름은 `snake_case`

## Data type

- int
- float
- long(0b, 0o, 0x)
- string
- boolean
- list, tuple, range
- set
- dictionary

## **type casting**

`float(3) --> int to float`

`int(3.6) --> float to int`

`str(1) --> int to string`

`int("12") --> string to int`

## input

```
name = input("What is your name? ")  
print("Hi, ", name)
```

## input with evaluation

```
input("How old are you? ")  
eval(input("How old are you? "))
```

## Small Project Again!

사용자의 입력을 받아 반지름( $r$ )을 선언한 뒤, 이를 이용하여 원의 지름, 둘레, 넓이, 구의 겉넓이, 부피를 각각 출력하는 파이썬 파일을 만들어보세요. ( $\pi=3.1415$ )

## type casting with input

```
int(input("How old are you? "))
```

# String Functions

```
func = "python is easy programming language"
func.count('p')

func.find('p')

comma = ","
func = comma.join('python')

func.split(',')

python_is_easy = "python is easy"
python_is_easy.split()

python_is_easy.replace("python", "golang")
```



# String Functions

```
some_string = "  computer  "  
some_string.strip()
```

```
some_string = ",,,Fastcampus..."  
some_string.strip(",")  
some_string.strip(".")
```

# String Formatting

```
print("I have a {}, I have an {}".format("pen", "apple"))
```

```
print("I have a {0}, I have an {1}".format("pen", "apple"))
```

```
print("I have a {0}, I have an {0}".format("pen", "apple"))
```

## padding and align

- `{:10}`
- `{:>10}`
- `{:^10}`
- `{:_^10}`

# List

List

```
animals = ['', '', '']
```

## List

**빈 list를 선언합니다. 선언과 동시에 값을 채워넣을 수 있습니다.**

```
lang = ["python", "c", "java", "golang"]
```

```
lang = []
```

**list에 요소를 추가합니다.**

```
lang.append("python")
```

```
lang.append("java")
```

```
lang.append("golang")
```

```
print(lang)
```

**혹은 특정한 위치에 원하는 값을 추가할 수 있습니다.**

```
lang.insert(1, "c")  
print(lang)
```

**특정 요소를 삭제할 수도 있습니다.**

```
lang.remove("golang")  
print(lang)
```

**혹은 리스트에 있던 값을 빼낼 수도 있습니다.**

```
java = lang.pop(2)  
print(lang)  
print(java)
```

**리스트를 정렬하는 법을 알아보니다.**

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

```
print(numbers)
```

```
numbers.sort()
```

```
print(numbers)
```

**리스트를 역순으로 출력하고 싶을땐 이렇게 한답니다.**

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

```
numbers.reverse()
```

```
print(numbers)
```

**리스트를 내림차순으로 정렬하려면??**



## 1. sort -> reverse

```
numbers.sort( )  
numbers.reverse( )
```

## 2. sort(reverse=True)

```
numbers.sort( reverse=True )
```

**특정 값의 위치를 출력할땐 이렇게 합니다.**

```
index_of_two = numbers.index(2)  
print(index_of_two)
```

**리스트끼리 더할 땐 extend를 활용합니다.**

```
numbers += [5, 6]  
print(numbers)  
numbers.extend([7, 8])  
print(numbers)
```

# 조건문

## Conditional Statements

배가 고프다!!!

- case 1: 집이라면
  - 밥이 있다면
  - 밥이 없다면
- case 2: 밖이라면
  - 현금이 10만원 초과라면
  - 현금이 5만원 초과라면
  - 현금이 없다면

# If

```
if 조건:  
    실행문
```

```
if 조건1 and 조건2:  
    실행문
```

```
if 조건1 or 조건2:  
    실행문
```

```
if not 조건:  
    실행문
```

## Comparison Operators

```
x == n
```

```
x != n
```

```
x < n
```

```
x > n
```

```
x <= n
```

```
x >= n
```

# if

```
if 현금 > 100000:  
    레스토랑으로 간다
```

```
cash = 120000  
if cash > 100000:  
    print("go to restaurant")
```

# else

```
if 조건:  
    실행문1  
else:  
    실행문2
```

```
cash = 120000  
if cash > 100000:  
    print("go to restaurant")  
else:  
    print("go to cvs")
```

## else if

```
if 조건1:
    실행문1
else:
    if 조건2:
        실행문2
    else:
        실행문3
```

```
cash = 120000
if cash > 100000:
    print("go to restaurant")
else:
    if cash > 50000:
        print("go to bobjib")
    else:
        print("go to cvs")
```



## if in else in if in else in ..

```
cash = 120000
if cash > 100000:
    print("go to restaurant")
else:
    if cash > 50000:
        print("go to bobjib")
    else:
        if cash > 30000:
            print("go to buffet")
        else:
            if cash > 20000:
                print("go to ramen store")
            else:
                if cash > 10000:
                    print("go to chinese restaurant")
                else:
                    print("go to cvs")
```

# elif

```
if 조건1:
    실행문1
elif 조건2:
    실행문2
elif 조건3:
    실행문3
...
else:
    실행문n
```

## elif

```
cash = 120000
if cash > 100000:
    print("go to restaurant")
elif cash > 50000:
    print("go to bobjib")
elif cash > 30000:
    print("go to buffet")
elif cash > 20000:
    print("go to ramen store")
elif cash > 10000:
    print("go to chinese restaurant")
else:
    print("go to cvs")
```

**If with Web scraper**

```

box_office_list = []
for tr in tr_list:
    a_list = tr.find_all("a")
    score = int(a_list[0].find("span", attrs={"class": "tMeterScore"}).text[:-1])
    url = base_uri + a_list[0]["href"]
    movie_name = a_list[1].text
    revenue = a_list[2].text[1:]

    # convert scale to zeros
    if revenue[-1] == 'M':
        digits = 6
    elif revenue[-1] == 'B':
        digits = 9
    elif revenue[-1] == 'K':
        digits = 3

    if revenue.find('.') == -1:
        revenue = int(revenue[:-1] + '0'*digits)
    elif revenue[0] == '0':
        revenue = int(revenue[1:-1].replace(".", "") + '0'*(digits-1))
    else:
        revenue = int(revenue[:-1].replace(".", "") + '0'*(digits-1))

    box_office_list.append((executed_time, url, score, movie_name, revenue))
box_office_list

```

# Do it your self!

## Numguess

- 1부터 100까지 정수 중 하나를 `answer` 라는 변수에 할당
- 사용자로 부터 임의의 값 하나를 받아 `guess` 라는 변수에 할당
- `answer` 와 `guess` 를 비교하여 정답여부를 출력

## numguess

```
import random

answer = random.randint(1,100)
print(answer)
```

## numguess

```
username = input("Hi there, What's your name?? ")
guess = eval(input("Hi, "+ username + "guess the number: "))

if guess == answer:
    print("Correct! The answer was ", str(answer))
else:
    print("That's not what I wanted!! The answer was ", str(answer))
```



# Iteration

# For, while

```
for 변수 in (리스트 or 문자열):  
    실행문1  
    ...
```

```
for i in ["python", "java", "golang"]:  
    print(i)
```

# For, while

```
sum = 0
for i in range(1,11):
    sum += i
    sum = sum + i
    print(sum)
```

# For, while

```
while 조건:  
    실행문1  
    ...
```

```
while name != "foo bar":  
    name = input("What's your name? ")  
    print("Hi, " + name + "So, where is foo bar?")
```

```
while 1:  
    print("Hello world!")
```

# Iterations with Conditional Statements

# Fizzbuzz

1부터 100까지 **반복하면서**,

3의 배수 = "Fizz"

5의 배수 = "Buzz"

15의 배수 = "FizzBuzz"

나머지 = 그 숫자

# Fizzbuzz

```
num = eval(input("type the number: "))  
  
for i in range(1, num + 1):  
    if i % 15 == 0:  
        print("fizzbuzz")  
    elif i % 3 == 0:  
        print("fizz")  
    elif i % 5 == 0:  
        print("buzz")  
    else:  
        print(i)
```

# Refactoring numguess

```
import random

answer = random.randint(1,100)
username = input("Hi there, What's your name?? ")

while True:
    guess = eval(input("Hi "+ username + ", guess the number: "))

    if guess == answer:
        print("Correct! The answer was ", str(answer))
        break
    else:
        print("That's not what I wanted!! Try again!!")
```



## give a hint!!

```
import random

answer = random.randint(1,100)
username = input("Hi there, What's your name?? ")

while True:
    guess = eval(input("Hi, "+ username + "guess the number: "))

    if guess == answer:
        print("Correct! The answer was ", str(answer))
        break
    elif guess > answer:
        print("Too high!! Try again!!")
    elif guess < answer:
        print("Too Low!! Try again!!")
```

# limit trial

```
import random

answer = random.randint(1,100)
username = input("Hi there, What's your name?? ")
trial = 5
while trial:
    guess = eval(input("Hi, "+ username + ". guess the number: "))

    if guess == answer:
        print("Correct! The answer was ", str(answer))
        break
    elif guess > answer:
        trial -= 1
        print("Too high!! Try again!!(%d times left)" % (trial))
    elif guess < answer:
        trial -= 1
        print("Too Low!! Try again!!(%d times left)" % (trial))
    if trial == 0:
        print("You are Wrong! The answer was ", str(answer))
```