

# Simple Input/Output

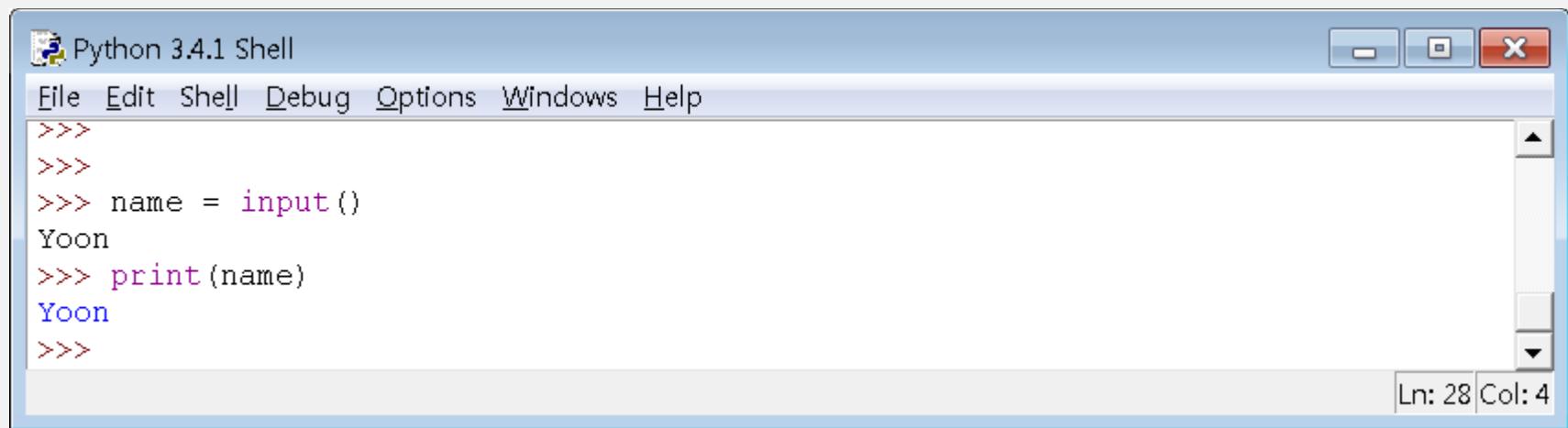
국민대 소프트웨어학부

# 수업목표

- `input()`
- `print`
- Inputting numbers
- Input from the Web

# input()

- 사용자 입력 함수
  - 함수: int(), float(), type(), ...
- 사용자로부터 스트링 입력



The screenshot shows the Python 3.4.1 Shell window. The menu bar includes File, Edit, Shell, Debug, Options, Windows, and Help. The main window displays the following interaction:

```
>>>
>>>
>>> name = input()
Yoon
>>> print(name)
Yoon
>>>
```

In the bottom right corner of the shell window, there is a status bar with "Ln: 28 Col: 4".

# input()

- input 함수
  - 명령 프롬프트에서 사용자로부터 입력 받는 함수
  - 사용자가 무엇을 입력해도 함수의 결과 값은 문자열(string)자료형

```
<입력 받을 변수> = input(<프롬프트 문자열>)
```

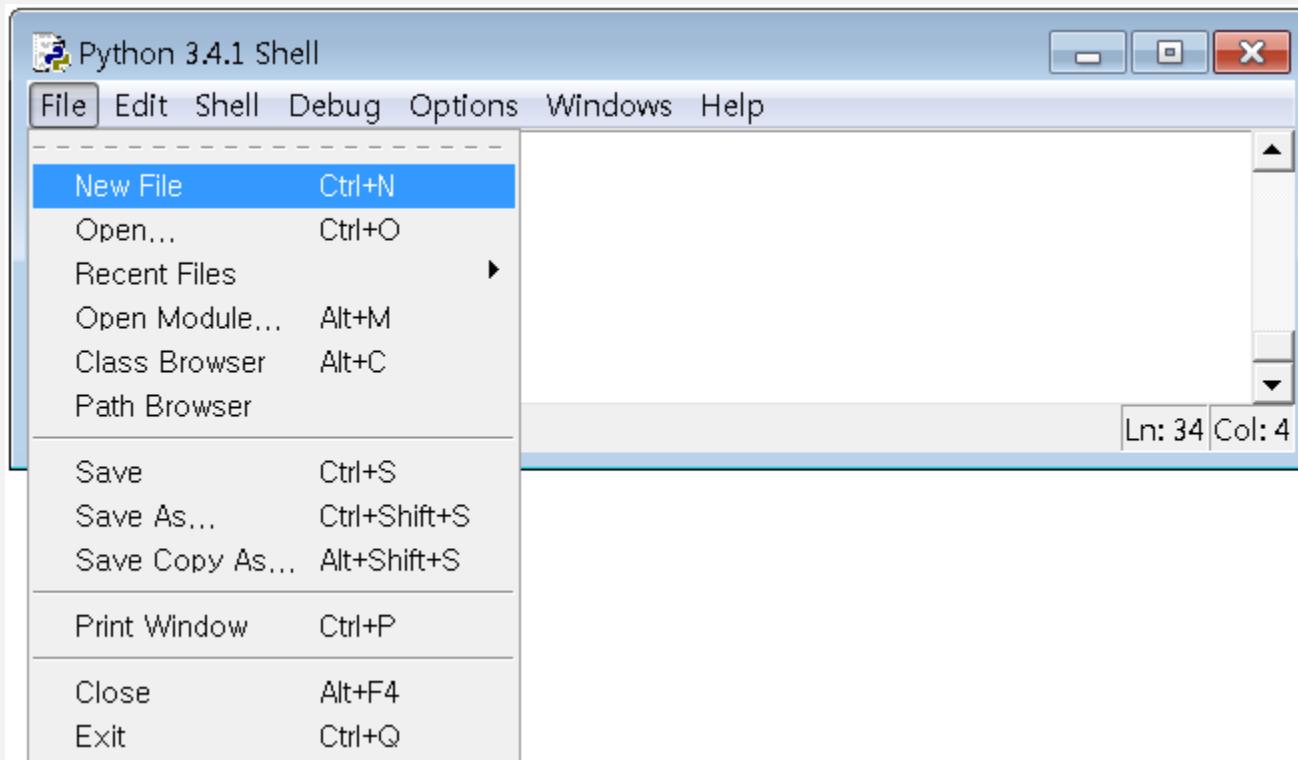
```
# 입력을 받습니다.  
string = input("입력> ")
```

```
# 출력 합니다.  
print(string)
```

# input()

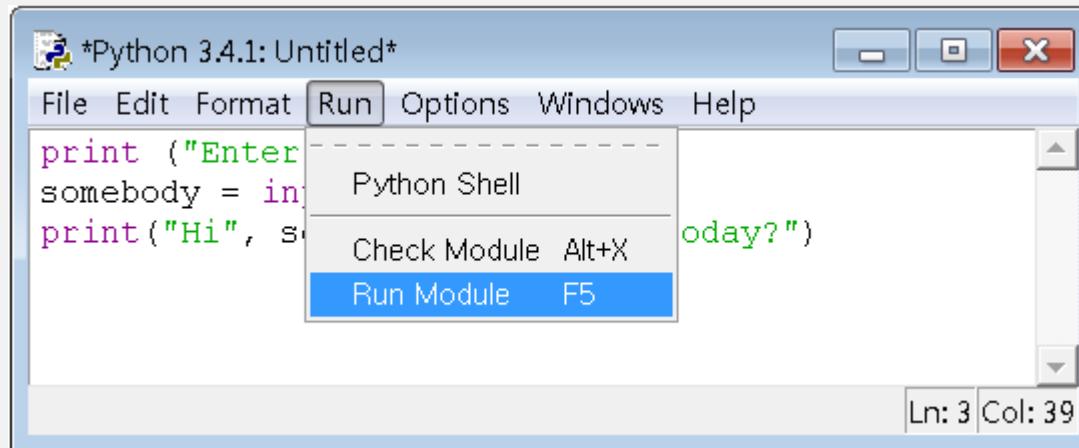
- 프로그램 코드 파일 생성 및 저장

- File → New File 또는 ctrl n
- 코드 타이핑
- 저장!



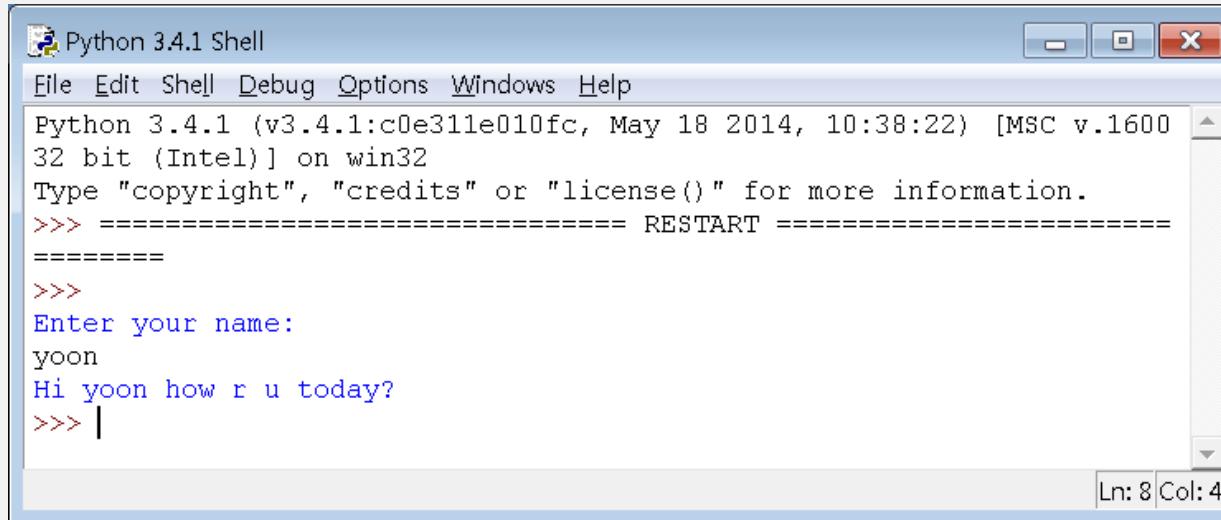
# input()

- 프로그램 코드 파일 실행
  - Run → Run Module 또는 F5



# input()

- 프로그램 코드 파일 실행
  - Run → Run Module 또는 F5



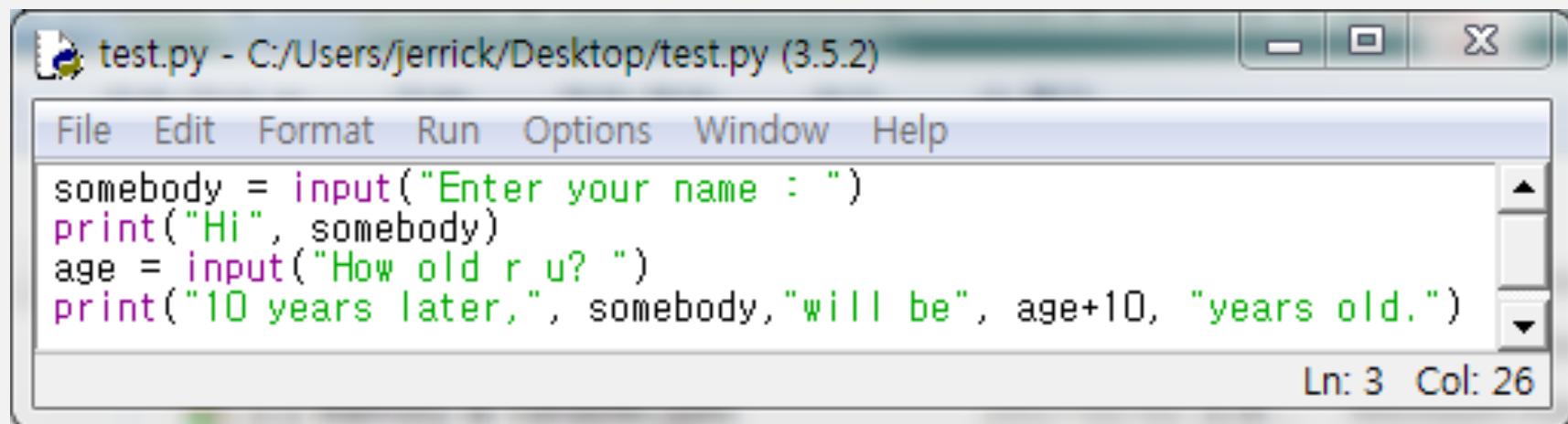
The screenshot shows the Python 3.4.1 Shell window. The title bar reads "Python 3.4.1 Shell". The menu bar includes File, Edit, Shell, Debug, Options, Windows, and Help. The main window displays the following text:

```
Python 3.4.1 (v3.4.1:c0e311e010fc, May 18 2014, 10:38:22) [MSC v.1600  
32 bit (Intel)] on win32  
Type "copyright", "credits" or "license()" for more information.  
>>> ===== RESTART =====  
=====  
>>>  
Enter your name:  
yoon  
Hi yoon how r u today?  
>>> |
```

In the bottom right corner of the shell window, there is a status bar with "Ln: 8 Col: 4".

# input()

- 사용자 입력 스트링의 숫자 변환
  - 스트링 + 숫자 → 에러 발생



A screenshot of a Windows-style application window titled "test.py - C:/Users/jerrick/Desktop/test.py (3.5.2)". The window contains a code editor with the following Python script:

```
somebody = input("Enter your name : ")
print("Hi", somebody)
age = input("How old r u? ")
print("10 years later,", somebody, "will be", age+10, "years old.")
```

The status bar at the bottom right shows "Ln: 3 Col: 26".

# input()

- 사용자 입력 스트링의 숫자 변환
  - 스트링 + 숫자 → 에러 발생

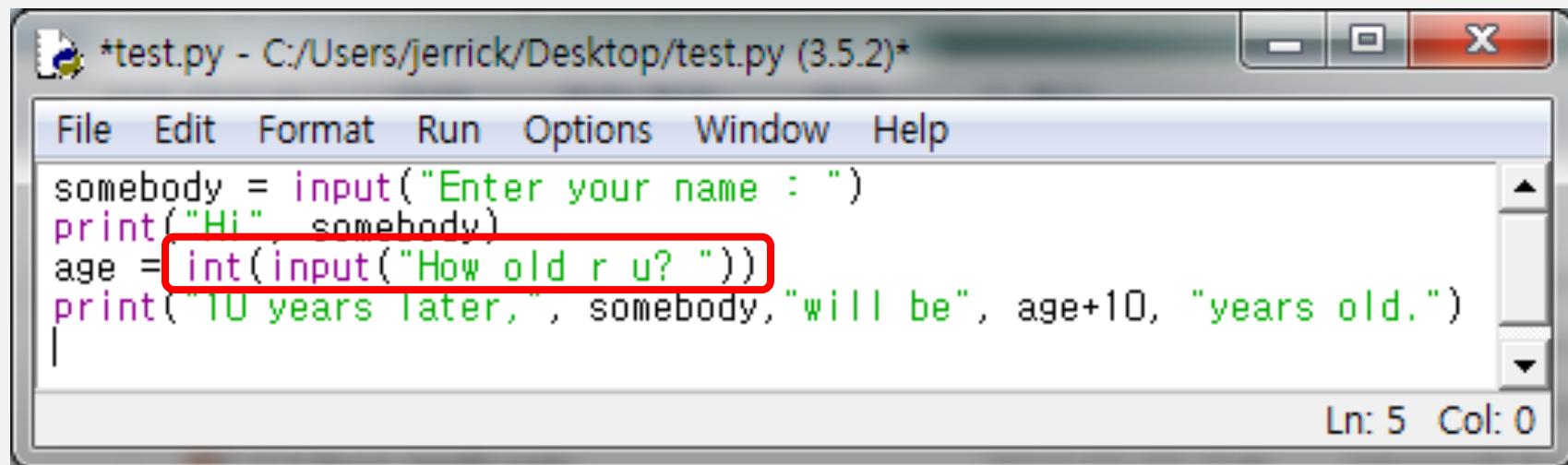
The screenshot shows a Python 3.5.2 Shell window. The menu bar includes File, Edit, Shell, Debug, Options, Window, and Help. The title bar says "Python 3.5.2 Shell". The main area displays the following text:

```
===== RESTART: C:/Users/jerrick/Desktop/test.py =====
Enter your name : Yoon
Hi Yoon
How old r u? 20
Traceback (most recent call last):
  File "C:/Users/jerrick/Desktop/test.py", line 4, in <module>
    print("10 years later, ", somebody, "will be", age+10, "years old.")
TypeError: Can't convert 'int' object to str implicitly
>>> |
```

The error message is a `TypeError` indicating that it's impossible to convert an `int` object to a `str` implicitly. The line causing the error is `print("10 years later, ", somebody, "will be", age+10, "years old.")`. The shell also shows the current line number (Ln: 73) and column number (Col: 4).

# input()

- 사용자 입력 스트링의 숫자 변환
  - int(), float() 사용



```
*test.py - C:/Users/jerrick/Desktop/test.py (3.5.2)*
File Edit Format Run Options Window Help
somebody = input("Enter your name : ")
print("Hi", somebody)
age = int(input("How old r u? "))
print("10 years later, ", somebody, "will be", age+10, "years old.")
|
Ln: 5 Col: 0
```

# print

- ‘+’ 연산
  - 스트링 연결 (string concatenation)
  - 숫자 합산 (add)

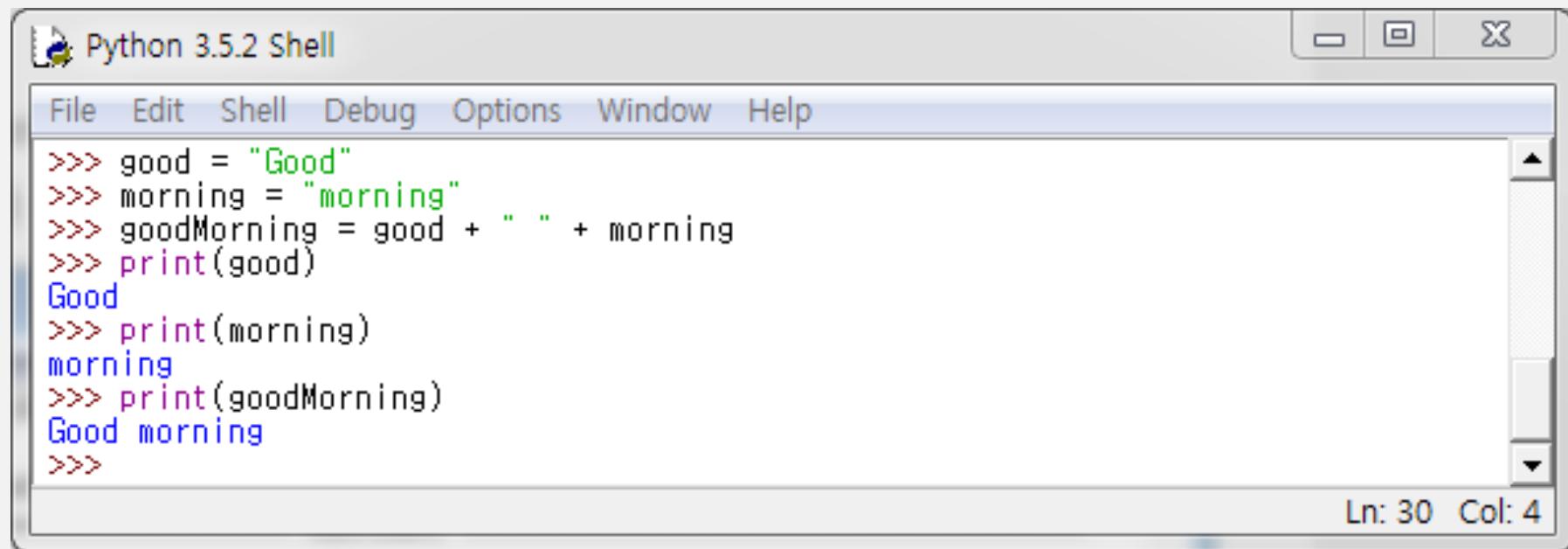
The screenshot shows the Python 3.4.1 Shell window. The title bar reads "Python 3.4.1 Shell". The menu bar includes File, Edit, Shell, Debug, Options, Windows, and Help. The main window displays the following text:

```
Python 3.4.1 (v3.4.1:c0e311e010fc, May 18 2014, 10:38:22) [MSC v.1600 32 bit (Intel)] on win32
Type "copyright", "credits" or "license()" for more information.
>>> ===== RESTART =====
>>>
Good
morning
Good morning
Good morning
>>> |
```

In the bottom right corner of the shell window, there is a status bar with "Ln: 9 Col: 4".

# print

- '+' 연산
  - 스트링 연결 (string concatenation)
  - 숫자 합산 (add)



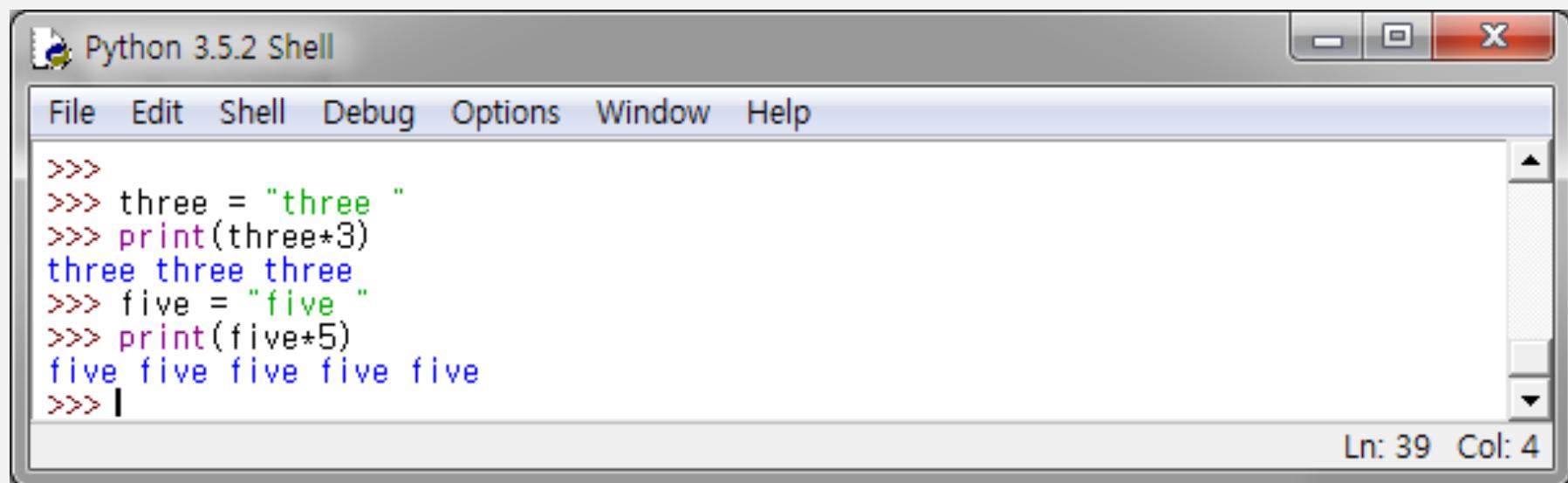
The screenshot shows a Python 3.5.2 Shell window. The menu bar includes File, Edit, Shell, Debug, Options, Window, and Help. The code input area contains the following Python code:

```
>>> good = "Good"
>>> morning = "morning"
>>> goodMorning = good + " " + morning
>>> print(good)
Good
>>> print(morning)
morning
>>> print(goodMorning)
Good morning
>>>
```

The output window shows the results of the print statements. The status bar at the bottom right indicates Ln: 30 Col: 4.

# print

- '\*' 연산
  - 스트링 반복 (string repetition)
  - 숫자 곱하기 (multiplication)



The screenshot shows a window titled "Python 3.5.2 Shell". The menu bar includes File, Edit, Shell, Debug, Options, Window, and Help. The main area contains the following Python code:

```
>>>
>>> three = "three "
>>> print(three*3)
three three three
>>> five = "five "
>>> print(five*5)
five five five five five
>>> |
```

The output shows the strings "three" and "five" repeated three and five times respectively. The status bar at the bottom right indicates "Ln: 39 Col: 4".

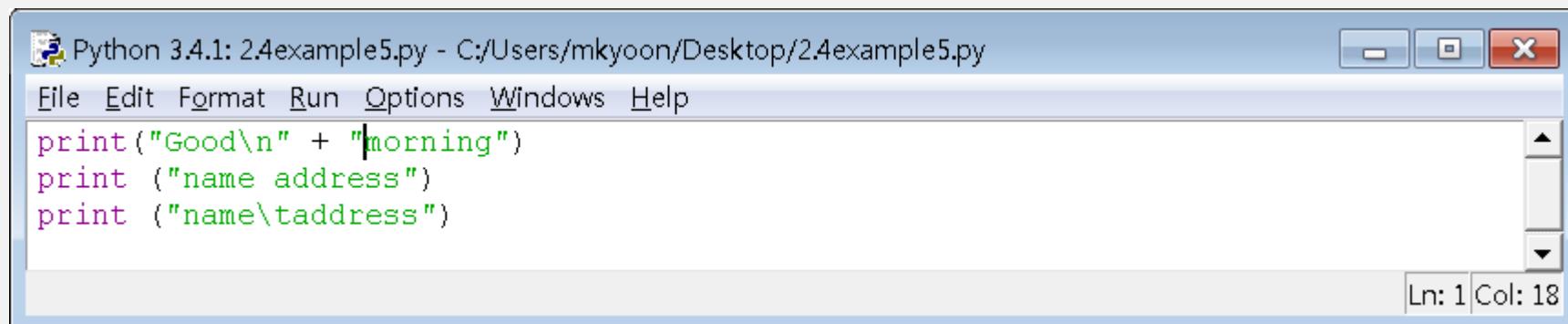
# print

- 문자열 길이 구하기
  - `len(<문자열>)` : 문자열의 길이를 반환한다.

```
# len( <객체> ) : <객체>의 길이를 반환하는 함수  
print(len("안녕하세요"))
```

# print

- 스트링 출력
  - 특수문자
    - '\n' : 새로운 라인 (new line)
    - '\t' : 탭(tab)

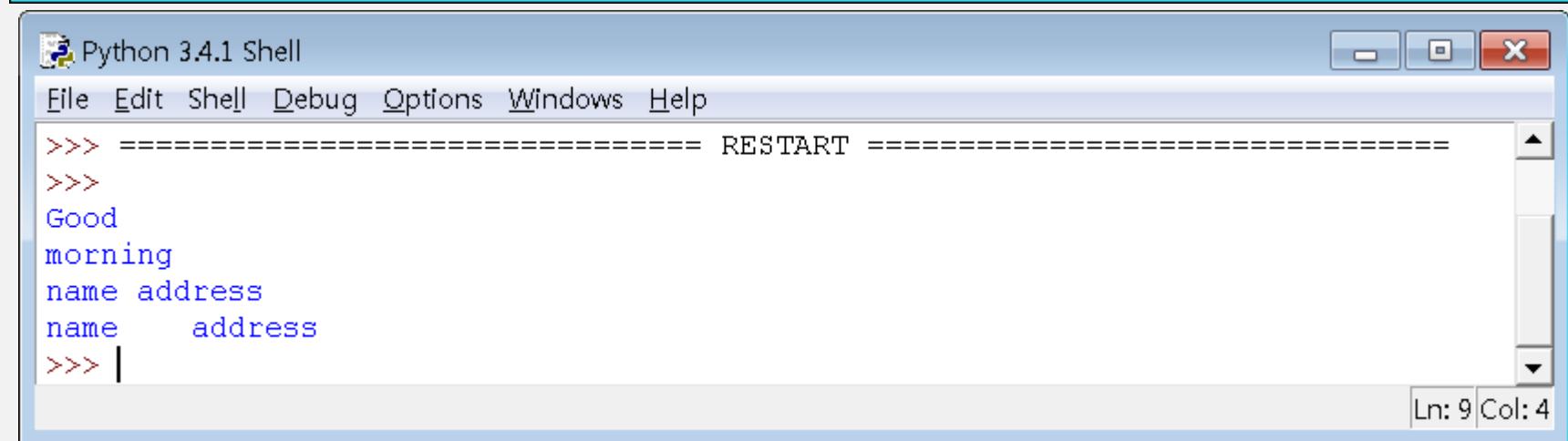


Python 3.4.1: 2.4example5.py - C:/Users/mkyoon/Desktop/2.4example5.py

```
File Edit Format Run Options Windows Help
print("Good\n" + "morning")
print ("name address")
print ("name\taddress")
```

Ln: 1 Col: 18

This screenshot shows the Python 3.4.1 IDLE interface. The title bar indicates it's running Python 3.4.1 and has opened the file 2.4example5.py located at C:/Users/mkyoon/Desktop/2.4example5.py. The menu bar includes File, Edit, Format, Run, Options, Windows, and Help. The code editor window contains three print statements. The first prints 'Good' on one line and 'morning' on the next. The second prints 'name address'. The third prints 'name' followed by a tab and 'address'. The status bar at the bottom right shows 'Ln: 1 Col: 18'.



Python 3.4.1 Shell

```
File Edit Shell Debug Options Windows Help
>>> ===== RESTART =====
>>>
Good
morning
name address
name      address
>>> |
```

Ln: 9 Col: 4

This screenshot shows the Python 3.4.1 Shell window. The title bar says 'Python 3.4.1 Shell'. The menu bar includes File, Edit, Shell, Debug, Options, Windows, and Help. The shell window displays the output of the code from the previous screenshot. It shows 'Good' on a new line, 'morning' on the next line, 'name address' on the third line, and 'name address' on the fourth line. The prompt '(>>> |)' is visible at the bottom. The status bar at the bottom right shows 'Ln: 9 Col: 4'.

# print

- 스트링 출력
  - 특수문자
    - '\n' : 새로운 라인 (new line)
    - '\t' : 탭(tab)

Python 3.4.1: 2.4example5.py - C:/Users/mkyoon/Desktop/2.4example5.py

```
File Edit Format Run Options Windows Help
print ("name\taddress")
print ("Kim\tSeoul")
print ("Lee\tBusan")
print ("Park\tJeju")
```

Ln: 5 Col: 0

This screenshot shows the Python 3.4.1 IDLE interface. The title bar indicates the file is named '2.4example5.py'. The menu bar includes File, Edit, Format, Run, Options, Windows, and Help. The code editor window contains four print statements. The first statement prints 'name\taddress', resulting in 'name' on one line and 'address' on the next due to the new line character. The subsequent three statements print 'Kim', 'Seoul', 'Lee', 'Busan', 'Park', and 'Jeju' on separate lines, each preceded by a tab character. The status bar at the bottom right shows 'Ln: 5 Col: 0'.

Python 3.4.1 Shell

```
File Edit Shell Debug Options Windows Help
>>> ===== RESTART =====
>>>
name      address
Kim       Seoul
Lee       Busan
Park      Jeju
>>>
```

Ln: 9 Col: 4

This screenshot shows the Python 3.4.1 Shell window. The title bar says 'Python 3.4.1 Shell'. The menu bar includes File, Edit, Shell, Debug, Options, Windows, and Help. The shell window displays the output of the previously shown code. It shows the names and addresses printed from the script, with each name followed by its corresponding address on a new line. The status bar at the bottom right shows 'Ln: 9 Col: 4'.

# print

- **스트링 출력**
  - 이스케이프 문자

확장문자	내용
\'	단일 인용문자
\"	이중 인용문자
\\"	역슬래시(back slash)문자
\a	Beep 소리문자
\b	백스페이스
\f	Form-feed
\n	개행문자(줄바꿈)
\r	Carrige return
\t	Tab (수평)
\v	Tab (수직)
\000	Null

# print

- 스트링 출력
  - 이스케이프 문자

```
print("성민이는 \"배가고프다\"라고 말했습니다.")  
print("햄버거\t피자\t치킨")  
print("www www www www www")
```

# print

- 여러 줄 문자열
  - 큰따옴표(또는 작은따옴표)를 3번 반복해서 사용하면 여러 줄 문자열을 표현 할 수 있다.
    - `₩` 를 하고 줄을 바꾸면, 줄 연속을 의미한다.

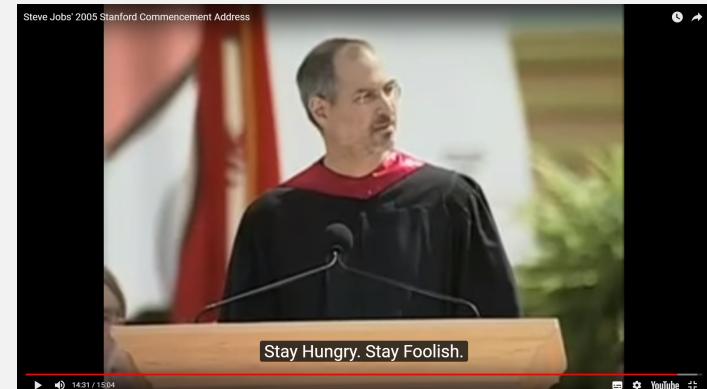
multiline = """₩

Don₩t let the noise of other₩s opinions drown out your inner voice.  
And most important, have the courage to follow your heart and intuition.  
They somehow already know what you truly want to become.  
Everything else is secondary.

"""

`print(multiline)`

<https://news.stanford.edu/2005/06/14/jobs-061505/>



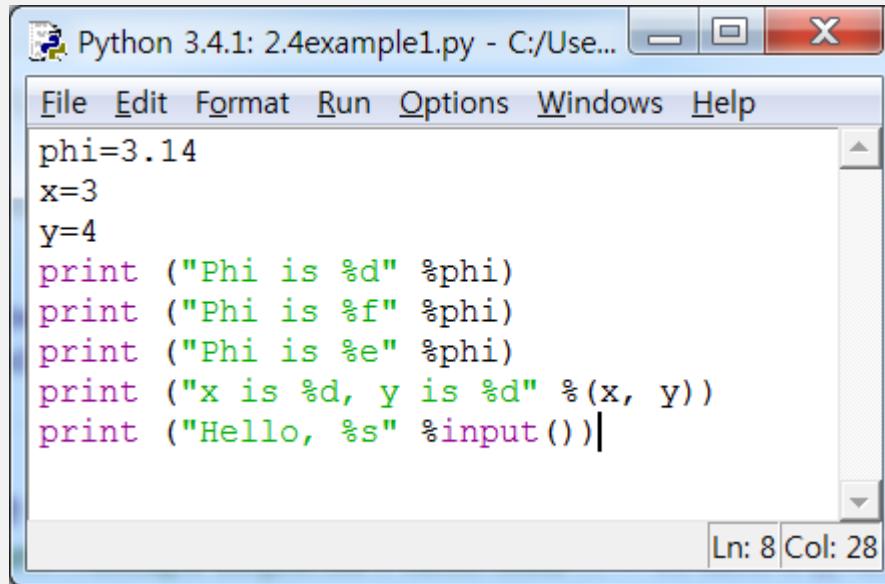
# print

- 스트링 출력 포맷

포맷	의미
%s	String(문자열)
%c	Character(문자)
%d	Decimal(10진수 정수)
%f	Floating-point(부동소수)
%o	Octal(8진수 정수)
%x	heXa(16진수 정수. 소문자표시)
%X	heXa(16진수 정수. 대문자표시)
%e	과학적 수치(소문자표시)
%E	과학적 수치(대문자표시)

# print

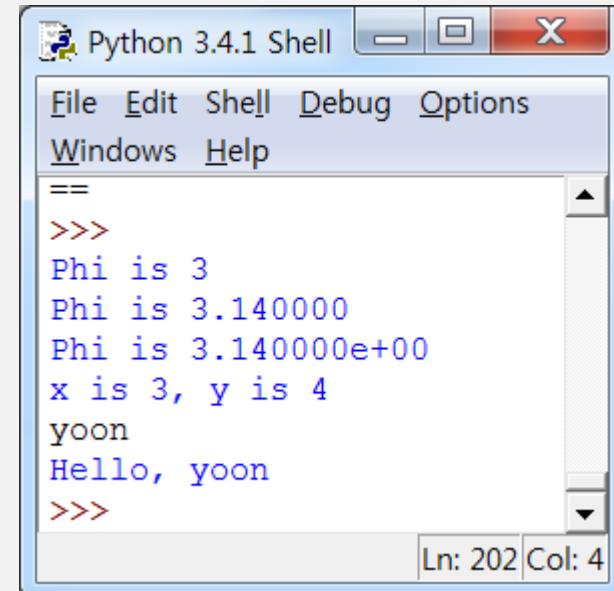
- 스트링 출력 포맷



Python 3.4.1: 2.4example1.py - C:/Use...

```
File Edit Format Run Options Windows Help
phi=3.14
x=3
y=4
print ("Phi is %d" %phi)
print ("Phi is %f" %phi)
print ("Phi is %e" %phi)
print ("x is %d, y is %d" %(x, y))
print ("Hello, %s" %input())|
```

Ln: 8 Col: 28



Python 3.4.1 Shell

```
File Edit Shell Debug Options
Windows Help
==>>>
Phi is 3
Phi is 3.140000
Phi is 3.140000e+00
x is 3, y is 4
yoon
Hello, yoon
>>>
```

Ln: 202 Col: 4

# print

- 스트링 출력 포맷

```
# 문자열  
print("I have %s apples." %"five")  
  
# 문자 1개  
print("My grade is %c." %'A')  
  
# 정수  
print("I have %d apples." %3)  
  
# 부동소수 및 %  
print("Error is %f%%" %3.234)  
  
# 8진수, 16진수  
print("%o %x %X" %(9, 10, 255))
```

# print

- format 메소드
  - '{}' 형태의 기호를 포함한 문자열 뒤에 '.format()' 을 붙여서 사용

```
# 문자열
print("I have {} apples.".format("five"))

# 문자 1개
print("My grade is {}.".format('A'))

# 정수
print("I have {} apples.".format(3))

# 부동소수 및 %
print("Error is {:.2%}".format(3.234))

# 8진수, 16진수
print("{} {} {}".format(9, 10, 255))
```

<https://docs.python.org/3/library/stdtypes.html?highlight=format#str.format>

# print

- 선택 연산자([<숫자>])
- 범위 선택 연산자([<숫자>:<숫자>])

```
# 연결 연산자(Concatenation)
print("안녕하세요" + "...!")
```

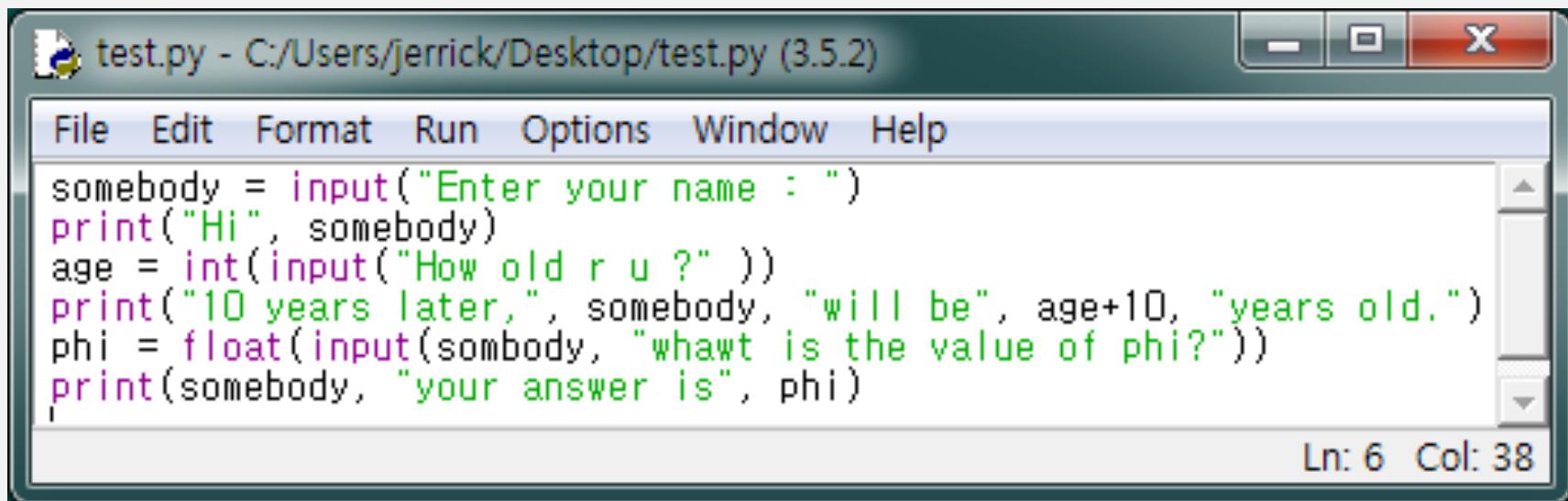
```
# 반복 연산자
print("안녕하세요" * 3)
```

```
# 선택 연산자(Indexing)
print("안녕하세요"[0])
print("안녕하세요"[1])
print("안녕하세요"[2])
print("안녕하세요"[3])
print("안녕하세요"[4])
```

```
# 범위 선택 연산자(Slicing)
print("안녕하세요"[0:2])
print("안녕하세요"[1:3])
print("안녕하세요"[2:4])
print("안녕하세요":[3])
print("안녕하세요"[3:])
```

# Inputting numbers

- String vs int vs float
  - 문자열 age를 정수로 변환하여 저장.
  - 문자열 phi를 실수로 변환하여 저장.



A screenshot of a Windows-style application window titled "test.py - C:/Users/jerrick/Desktop/test.py (3.5.2)". The window contains a code editor with the following Python script:

```
File Edit Format Run Options Window Help
somebody = input("Enter your name : ")
print("Hi", somebody)
age = int(input("How old r u ? "))
print("10 years later, ", somebody, "will be", age+10, "years old.")
phi = float(input(sombody, "whawt is the value of phi?"))
print(somebody, "your answer is", phi)
```

The status bar at the bottom right shows "Ln: 6 Col: 38".

# Inputting numbers

- 문자열을 숫자로 바꾸기
  - int 함수 또는 float 함수를 이용해서 바꾼다.
- 숫자를 문자열로 바꾸기
  - str 함수를 이용한다.

```
# 문자열 끼리 덧셈을 합니다.  
string1 = str(123)  
string2 = str(456)  
print("string1 + string2:", string1 + string2)  
  
# 정수 끼리 덧셈을 합니다.  
number1 = int("123")  
number2 = int("456")  
print("number1 + number2:", number1 + number2)
```

# Inputting numbers

- 실습
  - 사용자로부터 두 자연수 A, B를 입력 받고, 두 자연수의 사칙연산 결과를 출력하는 코드를 작성 하세요.

```
A : 5  
B : 2  
A+B : 7  
A-B : 3  
A*B : 10  
A/B : 2.5
```

# Inputting numbers

- 실습
  - 사용자로부터 두 자연수 A, B를 입력 받고, 두 자연수의 사칙연산 결과를 출력하는 코드를 작성 하세요.

```
A : 5  
B : 2  
A+B : 7  
A-B : 3  
A*B : 10  
A/B : 2.5
```

```
# 사용자로부터 두 자연수를 입력 받는다.
```

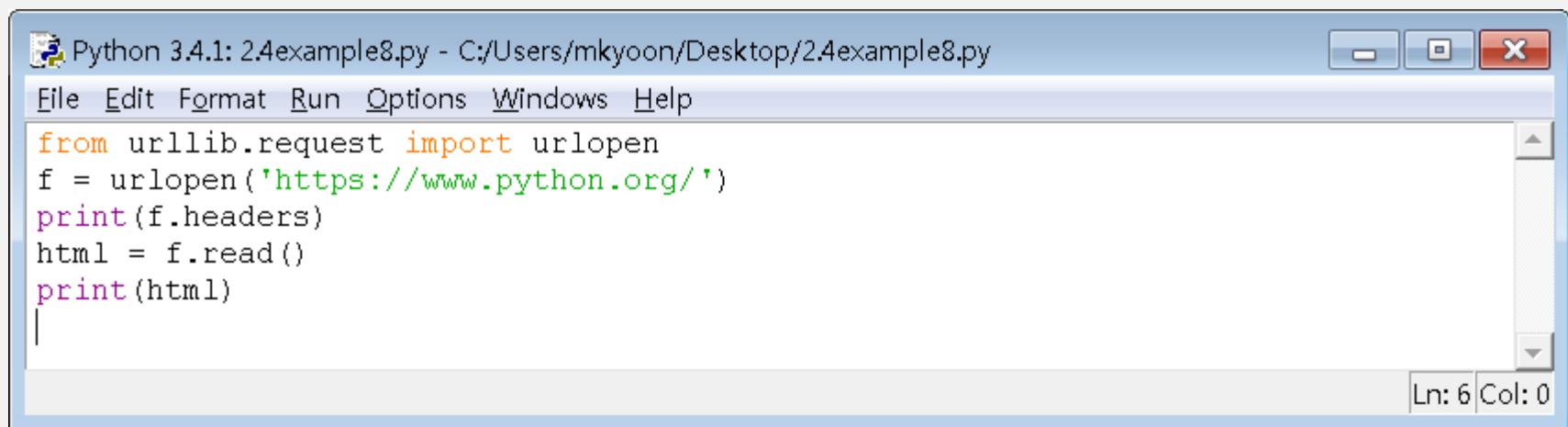
```
A = int(input("A : "))  
B = int(input("B : "))
```

```
# 사칙 연산의 결과를 출력 합니다.
```

```
print("A+B :", A+B)  
print("A-B :", A-B)  
print("A*B :", A*B)  
print("A/B :", A/B)
```

# Input from the web

- WWW(World Wide Web)으로부터의 입력
  - Html(Hyper-text markup language) 파일
  - “from urllib.request import urlopen”
    - from, import: 모듈 사용 명령어
    - urllib.request, urlopen: 사용 모듈
      - url: uniform resource locator



The screenshot shows a Windows-style application window titled "Python 3.4.1: 2.4example8.py - C:/Users/mkyoon/Desktop/2.4example8.py". The menu bar includes File, Edit, Format, Run, Options, Windows, and Help. The main code area contains the following Python script:

```
from urllib.request import urlopen
f = urlopen('https://www.python.org/')
print(f.headers)
html = f.read()
print(html)
```

The status bar at the bottom right indicates "Ln: 6 Col: 0".

# 실습

- 난수 생성 및 출력
  - random 모듈
    - import random 사용 (모듈에 대해서는 뒤에서 설명)
    - random.randint(a,b) : a이상 b이하인 숫자 임의 생성

```
Python 3.4.1: 2.4example2.py - C:/Users/mkyoon/Desktop...
File Edit Format Run Options Windows Help
import random

i=1
print("Random #%d: %d" %(i, random.randint(1, 6)))
i+=1
print("Random #%d: %d" %(i, random.randint(1, 6)))

Ln: 1 Col: 0
```

```
Python 3.4.1 Shell
File Edit Shell Debug Options
Windows Help
=====
==>>>
Random #1: 5
Random #2: 2
Random #3: 5
Random #4: 3
Random #5: 3
>>> |
Ln: 264 Col: 4
```

# 숙제

- 로또
  - 1~45까지 숫자 중 임의로 5개의 숫자를 출력하는 프로그램을 작성하시오. 단, 모든 숫자가 선택될 확률은 동일해야 하며, 뽑히는 순서는 상관없다.