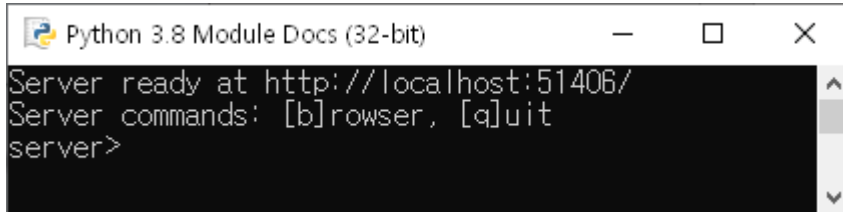


# Module Docs

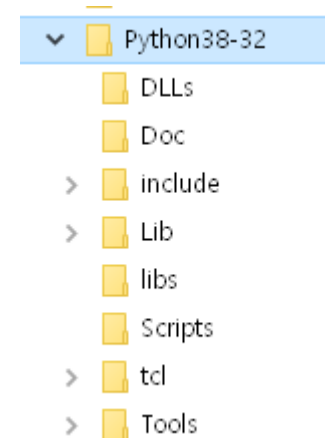
## 설치 모듈 문서

# 서버 프로그램, 브라우저에서 조회



```
Python 3.8 Module Docs (32-bit)
Server ready at http://localhost:51406/
Server commands: [b]rowser, [q]uit
server>
```

- **Built-in Modules**
  - 빌트인 모듈
- **D:\Python38-32\DLLs**
- **D:\Python38-32\Lib**
  - 표준 모듈과 패키지
- **D:\Python38-32\Lib\site-packages**
  - 설치된 외부 모듈



# 주요 빌트인 모듈

- math

The screenshot shows a web browser window displaying the Pydoc documentation for the `math` module. The browser's address bar shows `localhost:52055/math.html`. The page header includes links for [Module Index](#), [Topics](#), and [Keywords](#), along with a search bar. The main content area is titled `math` and includes a sub-link for [index \(built-in\)](#). Below the title, a brief description states: "This module provides access to the mathematical functions defined by the C standard." The `Functions` section lists several mathematical functions with their descriptions:

- `acos(x, /)`: Return the arc cosine (measured in radians) of x.
- `acosh(x, /)`: Return the inverse hyperbolic cosine of x.
- `asin(x, /)`: Return the arc sine (measured in radians) of x.
- `asinh(x, /)`: Return the inverse hyperbolic sine of x.
- `atan(x, /)`: Return the arc tangent (measured in radians) of x.
- `atan2(y, x, /)`: Return the arc tangent (measured in radians) of y/x. Unlike `atan(y/x)`, the signs of both x and y are considered.
- `atanh(x, /)`: Return the inverse hyperbolic tangent of x.
- `ceil(x, /)`: Return the ceiling of x as an Integral. This is the smallest integer  $\geq x$ .
- `comb(n, k, /)`: Number of ways to choose k items from n items without repetition and without order. Evaluates to  $n! / (k! * (n - k)!)$  when  $k \leq n$  and evaluates to zero when  $k > n$ . Also called the binomial coefficient because it is equivalent to the coefficient of k-th term in polynomial expansion of the expression  $(1 + x)^n$ . Raises `TypeError` if either of the arguments are not integers. Raises `ValueError` if either of the arguments are negative.
- `copysign(x, y, /)`: Return a float with the magnitude (absolute value) of x but the sign of y.

# 주요 빌트인 모듈

- **sys**

The screenshot shows a web browser displaying the Python 3.8.1 documentation for the `sys` module. The page title is "Python 3.8.1 [tags/v3.8.1:1b293b6, MSC v.1916 32 bit (Intel)] Windows-10". The browser address bar shows "localhost:52055/sys.html". The page content includes a search bar, a "Module Index : Topics : Keywords" link, and a "Search" button. The `sys` module is highlighted in blue, with links for "index (built-in)" and "Module Reference". The main text describes the module's purpose and lists dynamic and static objects.

Python 3.8.1 [tags/v3.8.1:1b293b6, MSC v.1916 32 bit (Intel)]  
Windows-10

[Module Index](#) : [Topics](#) : [Keywords](#)

[index \(built-in\)](#)  
[Module Reference](#)

**sys**

This module provides access to some objects used or maintained by the interpreter and to functions that interact strongly with the interpreter.

Dynamic objects:

`argv` -- command line arguments; `argv[0]` is the script pathname if known  
`path` -- module search path; `path[0]` is the script directory, else ''  
`modules` -- dictionary of loaded modules

`displayhook` -- called to show results in an interactive session  
`excepthook` -- called to handle any uncaught exception other than `SystemExit`  
 To customize printing in an interactive session or to install a custom top-level exception handler, assign other functions to replace these.

`stdin` -- standard input file object; used by `input()`  
`stdout` -- standard output file object; used by `print()`  
`stderr` -- standard error object; used for error messages  
 By assigning other file objects (or objects that behave like files) to these, it is possible to redirect all of the interpreter's I/O.

`last_type` -- type of last uncaught exception  
`last_value` -- value of last uncaught exception  
`last_traceback` -- traceback of last uncaught exception  
 These three are only available in an interactive session after a traceback has been printed.

Static objects:

`builtin_module_names` -- tuple of module names built into this interpreter  
`copyright` -- copyright notice pertaining to this interpreter  
`exec_prefix` -- prefix used to find the machine-specific Python library  
`executable` -- absolute path of the executable binary of the Python interpreter  
`float_info` -- a named tuple with information about the float implementation.  
`float_repr_style` -- string indicating the style of `repr()` output for floats  
`hash_info` -- a named tuple with information about the hash algorithm.  
`hexversion` -- version information encoded as a single integer  
`implementation` -- Python implementation information.  
`int_info` -- a named tuple with information about the int implementation.  
`maxsize` -- the largest supported length of containers.  
`maxunicode` -- the value of the largest Unicode code point  
`platform` -- platform identifier  
`prefix` -- prefix used to find the Python library  
`thread_info` -- a named tuple with information about the thread implementation.  
`version` -- the version of this interpreter as a string  
`version_info` -- version information as a named tuple  
`_dlopen` -- [Windows only] integer handle of the Python DLL

# 모듈 **sys os** 관련 코드

```
import sys
print(sys.prefix, '\n')
print(sys.version, '\n')
print(sys.copyright, '\n')
print(sys.platform, '\n')
print(sys.modules, '\n')
print(sys.path, '\n')

import os
print(os.system('dir'), '\n')
print(os.environ, '\n')
print(os.getcwd(), '\n')
print(os.environ['path'], '\n')
```

D:\Python38-32

3.8.1 (tags/v3.8.1:1b293b6, Dec 18 2019, 22:39:24) [MSC v.1916 32 bit (Intel)]

# 주요 표준 모듈 random

- D:\Python38-32\lib
  - random
    - 파일 random.py



Pydoc: getfile d:\python38-32\lib\random.py

Python 3.8.1 [tags/v3.8.1:1b293b6, MSC v.1916 32 bit (Intel)]  
Windows-10

[Module Index](#) : [Topics](#) : [Keywords](#)

### File Listing

File: d:\python38-32\lib\random.py

```
"""Random variable generators.

Integers
-----
uniform within range

Sequences
-----
pick random element
pick random sample
pick weighted random sample
generate random permutation

Distributions on the real line:
-----
uniform
triangular
normal (Gaussian)
lognormal
negative exponential
gamma
beta
pareto
Weibull

Distributions on the circle (angles 0 to 2pi)
-----
circular uniform
von Mises

General notes on the underlying Mersenne Twister core generator:

* The period is 2**19937-1.
* It is one of the most extensively tested generators in existence.
* The random() method is implemented in C, executes in a single Python step,
  and is, therefore, threadsafe.

...

from warnings import warn as _warn
from math import log as _log, exp as _exp, pi as _pi, e as _e, ceil as _ceil
from math import sqrt as _sqrt, acos as _acos, cos as _cos, sin as _sin
```



Pydoc: module random

localhost:52055/random.html

Python 3.8.1 [tags/v3.8.1:1b293b6, MSC v.1916 32 bit (Intel)]  
Windows-10

[Module Index](#) : [Topics](#) : [Keywords](#)

## random

[index](#)  
[d:\python38-32\lib\random.py](#)

[Random](#) variable generators.

Integers

-----

uniform within range

Sequences

-----

pick random element  
pick random sample  
pick weighted random sample  
generate random permutation

Distributions on the real line:

-----

uniform  
triangular  
normal (Gaussian)  
lognormal  
negative exponential  
gamma  
beta  
pareto  
Weibull

Distributions on the circle (angles 0 to 2pi)

-----

circular uniform  
von Mises

General notes on the underlying Mersenne Twister core generator:

- \* The period is 2\*\*19937-1.
- \* It is one of the most extensively tested generators in existence.
- \* The `random()` method is implemented in C, executes in a single Python step, and is, therefore, threadsafe.

### Modules

[os](#) [random](#)

### Classes

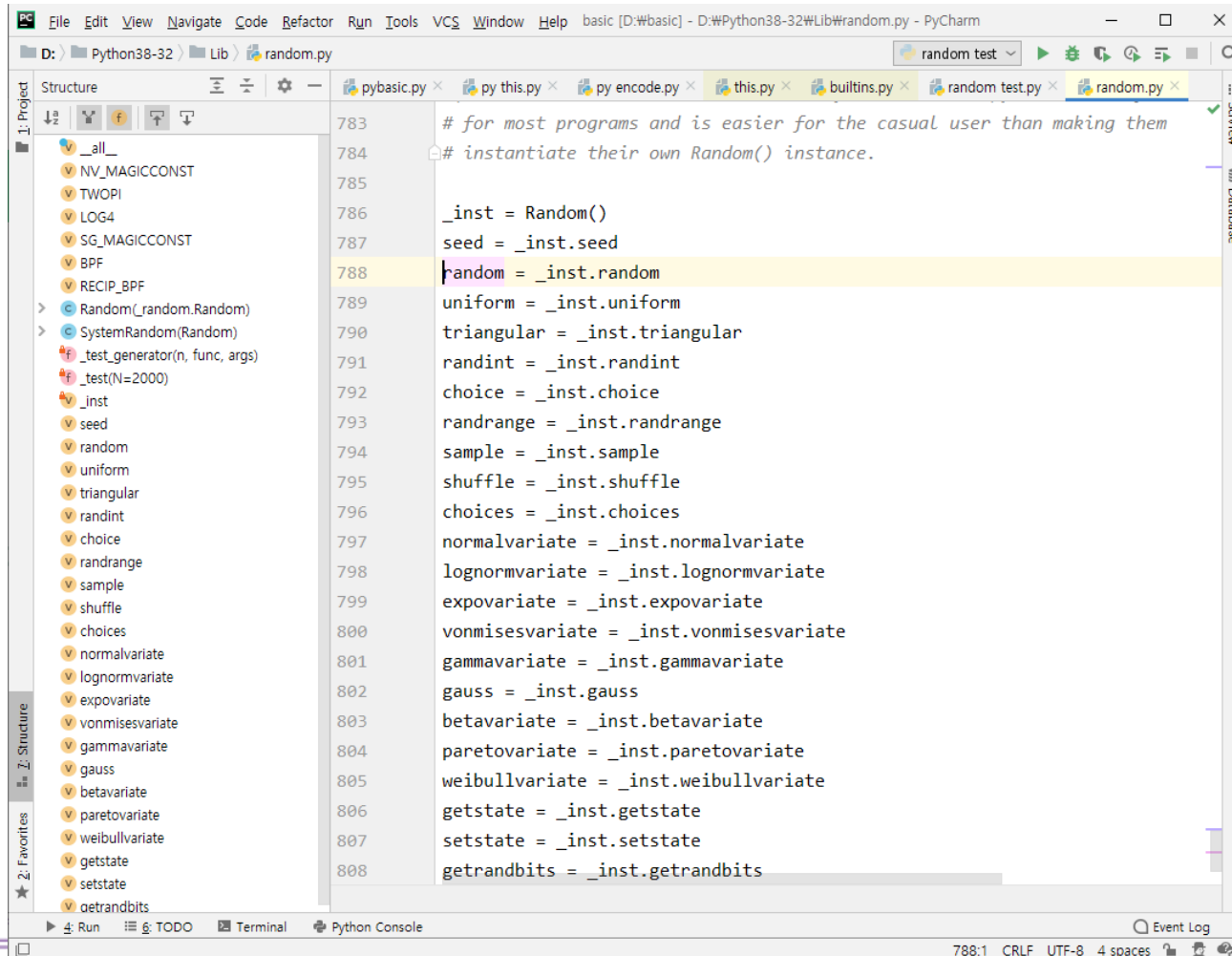
[random.Random\(builtins.object\)](#)

[Random](#)

[SystemRandom](#)

# 파일 random.py

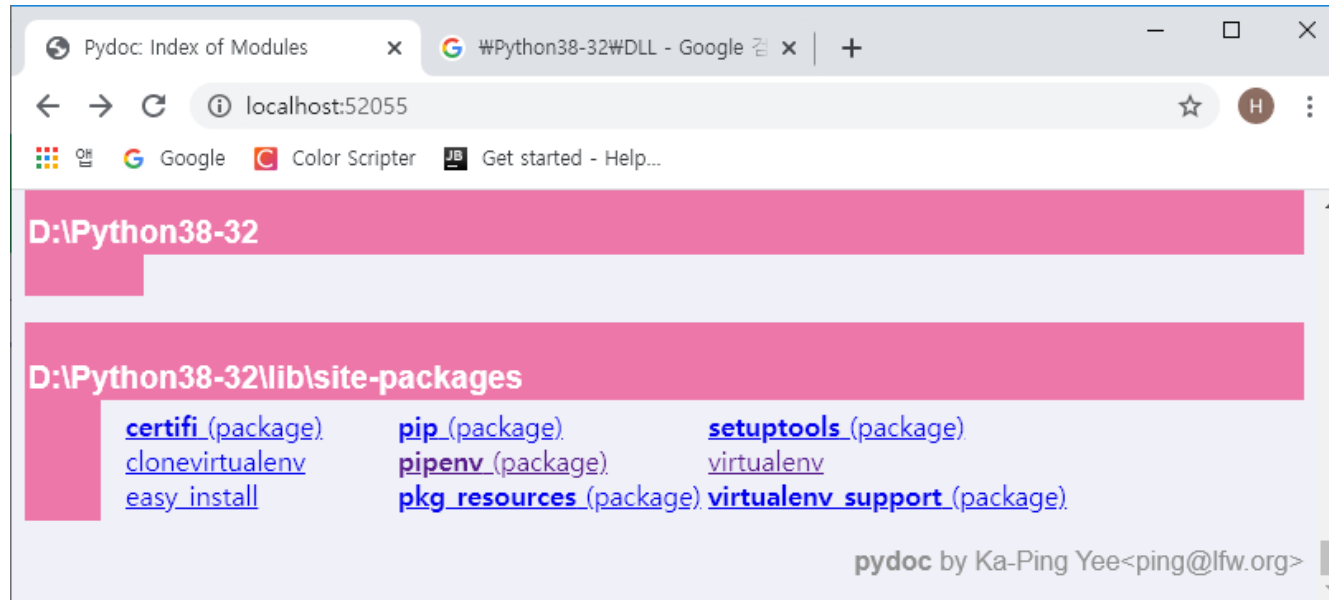
- 파이참에서 직접 보기



```
783 # for most programs and is easier for the casual user than making them
784 # instantiate their own Random() instance.
785
786 _inst = Random()
787 seed = _inst.seed
788 random = _inst.random
789 uniform = _inst.uniform
790 triangular = _inst.triangular
791 randint = _inst.randint
792 choice = _inst.choice
793 randrange = _inst.randrange
794 sample = _inst.sample
795 shuffle = _inst.shuffle
796 choices = _inst.choices
797 normalvariate = _inst.normalvariate
798 lognormvariate = _inst.lognormvariate
799 expovariate = _inst.expovariate
800 vonmisesvariate = _inst.vonmisesvariate
801 gammavariate = _inst.gammavariate
802 gauss = _inst.gauss
803 betavariate = _inst.betavariate
804 paretovariate = _inst.paretovariate
805 weibullvariate = _inst.weibullvariate
806 getstate = _inst.getstate
807 setstate = _inst.setstate
808 getrandbits = _inst.getrandbits
```

# 설치된 외부 모듈

- D:\Python38-32\lib\site-packages





# Python Cheat Sheet

# Beginner's Python Cheat Sheet

## Variables and Strings

*Variables are used to store values. A string is a series of characters, surrounded by single or double quotes.*

Hello world

```
print("Hello world!")
```

Hello world with a variable

```
msg = "Hello world!"  
print(msg)
```

Concatenation (combining strings)

```
first_name = 'albert'  
last_name = 'einstein'  
full_name = first_name + ' ' + last_name  
print(full_name)
```

## Lists

*A list stores a series of items in a particular order. You access items using an index, or within a loop.*

Make a list

```
bikes = ['trek', 'redline', 'giant']
```

Get the first item in a list

```
first_bike = bikes[0]
```

Get the last item in a list

```
last_bike = bikes[-1]
```

Looping through a list

```
for bike in bikes:  
    print(bike)
```

Adding items to a list

```
bikes = []  
bikes.append('trek')  
bikes.append('redline')  
bikes.append('giant')
```

Making numerical lists

```
squares = []  
for x in range(1, 11):  
    squares.append(x**2)
```

## Lists (cont.)

List comprehensions

```
squares = [x**2 for x in range(1, 11)]
```

Slicing a list

```
finishers = ['sam', 'bob', 'ada', 'bea']  
first_two = finishers[:2]
```

Copying a list

```
copy_of_bikes = bikes[:]
```

## Tuples

*Tuples are similar to lists, but the items in a tuple can't be modified.*

Making a tuple

```
dimensions = (1920, 1080)
```

## If statements

*If statements are used to test for particular conditions and respond appropriately.*

Conditional tests

equals	x == 42
not equal	x != 42
greater than	x > 42
or equal to	x >= 42
less than	x < 42
or equal to	x <= 42

Conditional test with lists

```
'trek' in bikes  
'surly' not in bikes
```

Assigning boolean values

```
game_active = True  
can_edit = False
```

A simple if test

```
if age >= 18:  
    print("You can vote!")
```

If-elif-else statements

```
if age < 4:  
    ticket_price = 0  
elif age < 18:  
    ticket_price = 10  
else:  
    ticket_price = 15
```

## Dictionaries

*Dictionaries store connections between pieces of information. Each item in a dictionary is a key-value pair.*

A simple dictionary

```
alien = {'color': 'green', 'points': 5}
```

Accessing a value

```
print("The alien's color is " + alien['color'])
```

Adding a new key-value pair

```
alien['x_position'] = 0
```

Looping through all key-value pairs

```
fav_numbers = {'eric': 17, 'ever': 4}  
for name, number in fav_numbers.items():  
    print(name + ' loves ' + str(number))
```

Looping through all keys

```
fav_numbers = {'eric': 17, 'ever': 4}  
for name in fav_numbers.keys():  
    print(name + ' loves a number')
```

Looping through all the values

```
fav_numbers = {'eric': 17, 'ever': 4}  
for number in fav_numbers.values():  
    print(str(number) + ' is a favorite')
```

## User input

*Your programs can prompt the user for input. All input is stored as a string.*

Prompting for a value

```
name = input("What's your name? ")  
print("Hello, " + name + "!")
```

Prompting for numerical input

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

```
pi = input("What's the value of pi? ")  
pi = float(pi)
```

## Python Crash Course

*Covers Python 3 and Python 2*

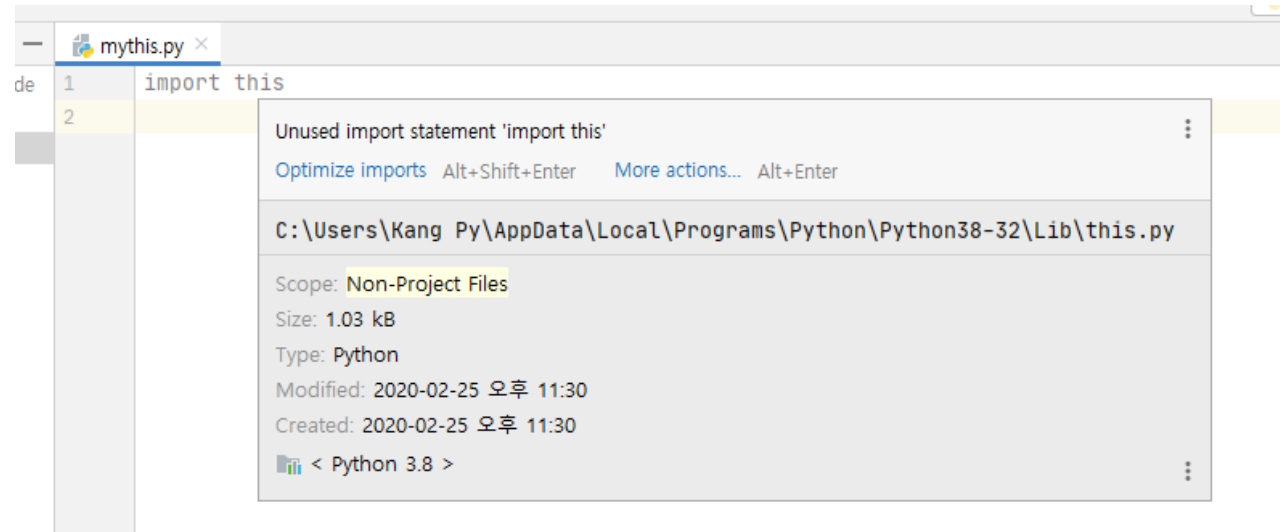
[nostarchpress.com/pythoncrashcourse](http://nostarchpress.com/pythoncrashcourse)



파이썬의 특징:  
스트링, 리스트,  
딕셔너리, 컴프리헨션

# import this

- 실행



# 파일 this.py

## • 파일

– C:\Users\사용자\AppData\Local\Programs\Python\Python38-32\Lib\this.py

```

1 s = """Gur Mra bs Clguba, ol Gvz Crgref
2
3 Ornghvshy vf orggre guna htyl.
4 Rkcyvpgv vf orggre guna vzcypvg.
5 Fzcyr vf orggre guna pbzcyrk.
6 Pbzcyrk vf orggre guna pbzcyvpngrq.
7 Syng vf orggre guna arfgrq.
8 Fcnefr vf orggre guna qrafr.
9 Ernqnovyvgl pbhagf.
10 Fcprvny pnfrf nera'g fcrpvny rabhtu gb oernx gur ehyrf.
11 Nygubhtu cenpgvpnyvgl orngf chevgl.
12 Reebef fubhyq arire cnff fvyragyl.
13 Hayrff rkcyvpgyl fvyraprq.
14 Va gur snpr bs nzovthvgl, ershfr gur grzcgngvba gb thrff.
15 Gurer fubhyq or bar-- naq cersrenoyl bayl bar --boivbhf jnl gb qb vg.
16 Nygubhtu gung jnl znl abg or boivbhf ng svefg hayrff lbh'er Qhgpu.
17 Abj vf orggre guna arire.
18 Nygubhtu arire vf bsgra orggre guna *evtug* abj.
19 Vs gur vzcyrzragngvba vf uneq gb rkcyvba, vg'f n onq vqrn.
20 Vs gur vzcyrzragngvba vf rnfl gb rkcyvba, vg znl or n tbbq vqrn.
21 Anzrfcnprf ner bar ubaxvat terng vqrn -- yrg'f qb zber bs gubfr!"""
22
23 d = {}
24 for c in (65, 97):
25     for i in range(26):
26         d[chr(i+c)] = chr((i+13) % 26 + c)
27
28 print("".join([d.get(c, c) for c in s]))
29

```

Run: mythis

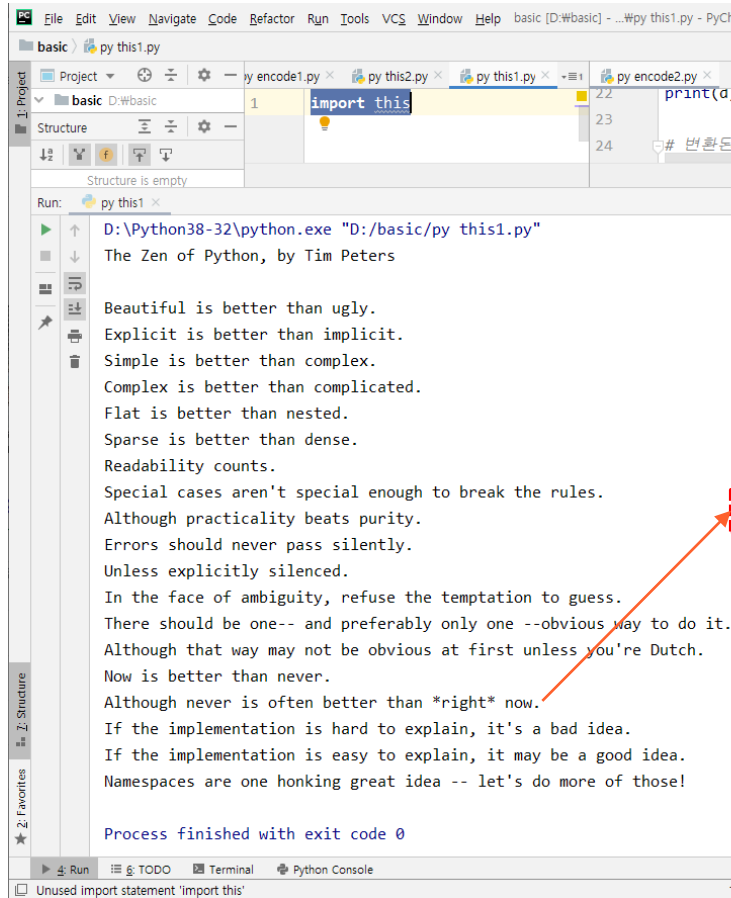
If the implementation is easy to explain, it may be a good idea.  
Namespaces are one honking great idea -- let's do more of those!

Process finished with `exit` code 0

25:1 CRLF UTF-8 4 spaces Python 3.8

# import this

## 파이썬 철학



```
s = """Gur Mra bs Clguba, ol Gvz Crgref
```

```
Ornhgvshy vf orggre guna htyl.
Rkcyvpgv vf orggre guna vzcypvg.
Fvzcyr vf orggre guna pbzcyrk.
Pbzcyrk vf orggre guna pbzcyvpngrq.
Syng vf orggre guna arfgrq.
Fcnefr vf orggre guna qrafr.
Ernqnovyvgl pbhagf.
Fcrpvny pnfrf nera'g fcrpvny rabhtu gb oernx gur ehryf.
Nygubhtu cenpgvpnyvgl orngf chevgl.
Reebef fubhyq arire cnff fvyrargyl.
Hayrff rkcyvpvgyl fvyraprq.
Va gur snpr bs nzovthvgl, ershfr gur grzcgngvba gb thrff.
Gurer fubhyq or bar-- naq cersrenoyl bayl bar --boivbhf jnl gb qb vg.
Nygubhtu gung jnl znl abg or boivbhf ng svefg hayrff lbh'er Qhgpu.
Abj vf orggre guna arire.
Nygubhtu arire vf bsgra orggre guna *evtug* abj.
Vs gur vzcyrzragngvba vf uneq gb rkcyntva, vg f n onq vqrn.
Vs gur vzcyrzragngvba vf rnfl gb rkcyntva, vg znl or n tbbq vqrn.
Anzrfcnprf ner bar ubaxvat terng vqrn -- yrg'f qb zber bs gubfr!"""
```

```
d = {}
for c in (65, 97):
    for i in range(26):
        d[chr(i+c)] = chr((i+13) % 26 + c)
```

```
print("".join([d.get(c, c) for c in s]))
```

```
type(d)
```

# 문자열 `str.join()`

- `s.join(<iterable>)`
  - 반복 가능한 문자열을 연결
  - 문자열 `s`를 이터러블의 항목 사이에 붙인 문자열 반환

```
print('a,b,c'.split(','))
```

```
print('this is my string'.split())
```

```
s = "this is my string"
print(s.split(maxsplit=1))
```

```
print('a' + 'b' + 'c')
print('do' * 2)
```

```
strings = ['do', 're', 'mi']
print(','.join(strings))
```

```
print('->'.join('string'))
```

```
print(''.join(['p', 'y', 't', 'h', 'o', 'n']))
print(', '.join(['foo', 'bar', 'baz', 'qux']))
```

```
print(list('corge'))
print(':'.join(list('corge')))
print(':'.join('corge'))
```

```
print('---'.join(['foo', str(23), 'bar']))
```

# 문자열, 컴프리헨션

- 문자열
  - join()
- 리스트
- 컴프리헨션

D:\Python38-32\python.exe "D:/basic/py encode1.py"

```

Programming is an Art!
Uwtlwfrnsl%nx%fs%Fwy&
[0, 1, 2, 3, 4, 5, 6, 7, 8, 9]
['a', 'b', 'c', 'd', 'e', 'f', 'g', 'h', 'i', 'j', 'k', 'l', 'm', 'n', 'o', 'p', 'q',
'r', 's', 't', 'u', 'v', 'w', 'x', 'y', 'z']
['U', 'w', 't', 'l', 'w', 'f', 'r', 'r', 'n', 's', 'l', '%', 'n', 'x', '%', 'f', 's',
'%', 'F', 'w', 'y', '&']
python
python
p-y-t-h-o-n
Uwtlwfrnsl%nx%fs%Fwy&
Uwtlwfrnsl%nx%fs%Fwy&
Programming is an Art!
  
```

Process finished with exit code 0

```

s = 'Programming is an Art!'
print(s)

# 문자에 각각 5를 더하여 문자열을 출력
key = 5
for c in s:
    print(chr(ord(c) + key), end='')
print()

# 컴프리헨션 이해
print([i for i in range(10)])
print([chr(i) for i in range(ord('a'), ord('a') + 26)])

# 문자에 각각 5를 더한 문자 리스트를 출력
t = [chr(ord(c) + key) for c in s]
print(t)

# 문자열 str.join() 함수 이해
print(''.join('python'))
print(''.join(list('python')))
print('-'.join(list('python')))

# 문자에 각각 5를 더한 문자열 출력
e = '';
e = e.join([chr(ord(c) + key) for c in s])
print(e)

# 문자에 각각 5를 더한 문자열을 한 줄에 출력
print(''.join([chr(ord(c) + key) for c in s]))

e = '';
e = e.join([chr(ord(c) + key) for c in s])

# 비뀐 문자열을 다시 반대로 문자에 각각 5를 뺀 문자열을 한 줄에 출력
key = -key
print(''.join([chr(ord(c) + key) for c in e]))
  
```



# 파이썬 주요 자료

파이썬의 5가지 자료 구조, 변수 유형 (Python's 5 Data/Variable Types)				
1 수 (Numbers)	2 문자열 (String)	3 리스트 (List)	4 튜플 (Tuple)	5 사전 (Dictionary)
정수(Int) 100	'I Love You'	['abc', 123]	('abc', 123)	{'name': 'R Friend', 'region': 'Seoul, Korea', 'phone': '02-123-3456'}
부동소수형(float) 12.345	- A sequence set of characters - Enclosed by ' ', or ""	- 1 dimensional sequence of different data type objects - <b>Can be updated</b> - Enclosed by []	- 1 dimensional sequence of different data type objects - <b>Can NOT be updated</b> - Enclosed by ()	- Hash table type - Associative array - Key-value pairs - Enclosed by {}
복소수(complex) 3.45j				

R분석과 프로그래밍 (<http://rfriend.tistory.com>)

# 딕셔너리 생성

## The bracket method

```
data = {
    "beer_data": beers,
    "brewery_data": breweries
}
```

Key

Value

## The dict() method, option 1

```
data2 = dict(
    beer_data=beers,
    brewery_data=breweries
)
```

Key

Value

## The dict() method, option 2

```
tuple_list = [
    ("brewery_data", breweries),
    ("beer_data", beers)
]
```

Key

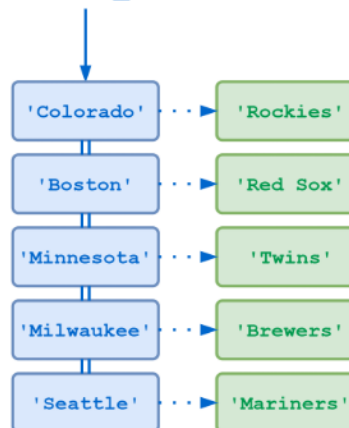
Value

```
data3 = dict(tuple_list)
```

Python

```
>>> MLB_team = {
...     'Colorado' : 'Rockies',
...     'Boston'   : 'Red Sox',
...     'Minnesota' : 'Twins',
...     'Milwaukee' : 'Brewers',
...     'Seattle'  : 'Mariners'
... }
```

MLB\_team



Dictionary Mapping Location to MLB Team

# 딕셔너리의 정렬



## [ Python Dictionary ] Sort a Dictionary by Key and Value

### dictionary

```
pgm = {
    "java": 20,
    "javascript": 8,
    "c": 7,
    "r": 4,
    "python": 28
}
```

sort  
by *Key*

### In Ascending order

```
sorted(pgm.items())
```

```
[('c', 7),
 ('java', 20),
 ('javascript', 8),
 ('python', 28),
 ('r', 4)]
```

### In Descending order

```
sorted(pgm.items(),
      reverse=True)
```

```
[('r', 4),
 ('python', 28),
 ('javascript', 8),
 ('java', 20),
 ('c', 7)]
```

sort  
by *Value*

```
sorted(pgm.items(),
      key=lambda x: x[1])
```

```
[('r', 4),
 ('c', 7),
 ('javascript', 8),
 ('java', 20),
 ('python', 28)]
```

```
sorted(pgm.items(),
      reverse=True,
      key=lambda x: x[1])
```

```
[('python', 28),
 ('java', 20),
 ('javascript', 8),
 ('c', 7),
 ('r', 4)]
```

R, Python 분석과 프로그래밍의 친구 <http://rfriend.tistory.com>

# 딕셔너리를 통한 인코딩

- 리스트 딕셔너리
  - 원소 쉽게 생성

D:\Python38-32\python.exe "D:/basic/py encode2.py"

Programming is Art!

{0: '1', 1: '2', 2: '3', 3: '4', 4: '5', 5: '6', 6: '7', 7: '8', 8: '9', 9: '10'}  
{ 'A': 'A', 'B': 'B', 'C': 'C', 'D': 'D', 'E': 'E', 'F': 'F', 'G': 'G', 'H': 'H',  
'I': 'I', 'J': 'J', 'K': 'K', 'L': 'L', 'M': 'M', 'N': 'N', 'O': 'O', 'P': 'P', 'Q':  
'Q', 'R': 'R', 'S': 'S', 'T': 'T', 'U': 'U', 'V': 'V', 'W': 'W', 'X': 'X', 'Y':  
'Y', 'Z': 'Z' }

{ 'A': 'D', 'B': 'E', 'C': 'F', 'D': 'G', 'E': 'H', 'F': 'I', 'G': 'J', 'H': 'K', 'I':  
'L', 'J': 'M', 'K': 'N', 'L': 'O', 'M': 'P', 'N': 'Q', 'O': 'R', 'P': 'S', 'Q':  
'T', 'R': 'U', 'S': 'V', 'T': 'W', 'U': 'X', 'V': 'Y', 'W': 'Z', 'X': 'A', 'Y':  
'B', 'Z': 'C' }  
{ 'a': 'd', 'b': 'e', 'c': 'f', 'd': 'g', 'e': 'h', 'f': 'i', 'g': 'j', 'h':  
'k', 'i': 'l', 'j': 'm', 'k': 'n', 'l': 'o', 'm': 'p', 'n': 'q', 'o': 'r', 'p': 's', 'q':  
't', 'r': 'u', 's': 'v', 't': 'w', 'u': 'x', 'v': 'y', 'w': 'z', 'x': 'a', 'y': 'b', 'z':  
'c' }

Surjudpplqj Iv Duw!

Surjudpplqj Iv Duw!

Programing is Art!

Process finished with exit code 0

```
s = 'Programming is Art!'
print(s)
```

```
# 딕셔너리 이해
```

```
d = {}
for i in range(10): # 알파벳 인코딩 딕셔너리 생성
    d[i] = str(i+1)
print(d)
```

```
d = {}
for i in range(ord('A'), ord('A') + 26): # 알파벳 인코딩 딕셔너리 생성
    d[chr(i)] = chr(i)
print(d)
```

```
# 인코딩을 위한 키, 값의 딕셔너리 생성
```

```
key = 3
```

```
d = {} # 딕셔너리 만들기
```

```
for c in (65, 97): # 알파벳 A, a에서 부터 시작하여
    for i in range(26): # 알파벳 인코딩 딕셔너리 생성
        d[chr(i+c)] = chr((i + key) % 26 + c)
```

```
print(d)
```

```
# 변환된 인코딩 문자열을 출력
```

```
# d.get(c, c): 키 c가 있으면 값, 없으면(알파벳이 아니면) 값은 동일한 c
print("".join([d.get(c, c) for c in s]))
```

```
# 인코딩 문자열을 e에 저장
```

```
e = '';
e = e.join([d.get(c, c) for c in s])
print(e)
```

```
# 다시 인코딩된 문자열을 원래의 문자열로 다시 변환하기 위한 딕셔너리 생성
```

```
key = -key
```

```
d = {} # 딕셔너리 만들기
```

```
for c in (65, 97): # 알파벳 A, a에서 부터 시작하여
    for i in range(26): # 알파벳 인코딩 딕셔너리 생성
        d[chr(i+c)] = chr((i + key) % 26 + c)
```

```
# 변환된 인코딩 문자열을 출력
```

```
print("".join([d.get(c, c) for c in e]))
```

# 표준 모듈 `this.py`의 이해

D:\Python38-32\python.exe "D:/basic/py this1.py"  
The Zen of Python, by Tim Peters

```
s = """Gur Mra bs Clguba, ol Gvz Crgref
```

```
Ornhgvshy vf orggre guna htyl.
Rkcyvpgv vf orggre guna vzcypvg.
Fvzcyr vf orggre guna pbzcyrk.
Pbzcyrk vf orggre guna pbzcyvpngrq.
Syng vf orggre guna arfgrq.
Fcnefr vf orggre guna qrafr.
Ernqnovyvg1 pbhagf.
Fcrpvny pnfrf nera'g fcrpvny rabhtu gb oernx gur ohyrf.
Nygubhtu cenpgvpnyvg1 orngf chevg1.
Reebef fubhyq arire cnff fvyragyl.
Hayrff rkcyvpgyl fvyraprq.
Va gur snpr bs nzovthvg1, ershfr gur grzcgngvba gb thrf.
Gurer fubhyq or bar-- naq cersrenoyl bayl bar --boivbhf jnl gb qb vg.
Nygubhtu gung jnl znl abg or boivbhf ng svefg hayrff lbh'er Qnqpu.
Abj vf orggre guna arire.
Nygubhtu arire vf bsgra orggre guna *evtug* abj.
Vs gur vzcyrzragngvba vf uneq gb rkcyuva, vg'f n ong vqrn.
Vs gur vzcyrzragngvba vf rnfl gb rkcyuva, vg znl or n tbbq vqrn.
Anzrfcnprf ner bar ubaxvat terng vqrn -- yrg'f qb zber bs gubfr!"""
```

```
d = {}
for c in (65, 97):
    for i in range(26):
        d[chr(i+c)] = chr((i+13) % 26 + c)

print("".join([d.get(c, c) for c in s]))

type(d)
```

Beautiful is better than ugly.  
Explicit is better than implicit.  
Simple is better than complex.  
Complex is better than complicated.  
Flat is better than nested.  
Sparse is better than dense.  
Readability counts.  
Special cases aren't special enough to break the rules.  
Although practicality beats purity.  
Errors should never pass silently.  
Unless explicitly silenced.  
In the face of ambiguity, refuse the temptation to guess.  
There should be one-- and preferably only one --obvious way to do it.  
Although that way may not be obvious at first unless you're Dutch.  
Now is better than never.  
Although never is often better than \*right\* now.  
If the implementation is hard to explain, it's a bad idea.  
If the implementation is easy to explain, it may be a good idea.  
Namespaces are one honking great idea -- let's do more of those!

Process finished with exit code 0

# 소스 pybasic.py 이해

```
# import this
s = """The Zen of Python, by Tim Peters

Beautiful is better than ugly.
Explicit is better than implicit.
Simple is better than complex.
Complex is better than complicated.
Flat is better than nested.
Sparse is better than dense.
Readability counts.
Special cases aren't special enough to break the rules.
Although practicality beats purity.
Errors should never pass silently.
Unless explicitly silenced.
In the face of ambiguity, refuse the temptation to guess.
There should be one-- and preferably only one --obvious way to do it.
Although that way may not be obvious at first unless you're Dutch.
Now is better than never.
Although never is often better than *right* now.
If the implementation is hard to explain, it's a bad idea.
If the implementation is easy to explain, it may be a good idea.
Namespaces are one honking great idea -- let's do more of those!"""

d = {}
for c in (65, 97):
    for i in range(26):
        d[chr(i+c)] = chr((i-13) % 26 + c)

print("".join([d.get(c, c) for c in s]))
```

D:\Python38-32\python.exe D:/basic/pybasic.py  
Gur Mra bs Clguba, ol Gvz Crgref

Ornhgvshy vf orggre guna htyl.  
Rkcyvpvg vf orggre guna vzcyvpvg.  
Fvzcyr vf orggre guna pbzcyrk.  
Pbzcyrk vf orggre guna pbzcyvpngrq.  
Syng vf orggre guna arfgrq.  
Fcnefr vf orggre guna qrafr.  
Ernqnovyvg pbhagf.  
Fcrpvny pnfrf nera'g fcrpvny rabhtu gb oernx gur ehyrf.  
Nygubhtu cenpgvpnyvgl orngf chevgl.  
Reebef fubhyq arire cnff fvyragyl.  
Hayrff rkcyvpvgyl fvyraprq.  
Va gur snpr bs nzovthvgl, ershfr gur grzcgngvba gb thrff.  
Gurer fubhyq or bar-- naq cersrenoyl bayl bar --boivbhf jnl gb qb vg.  
Nygubhtu gung jnl znl abg or boivbhf ng svefg hayrff lbh'er Qhgpu.  
Abj vf orggre guna arire.  
Nygubhtu arire vf bsgra orggre guna \*evtug\* abj.  
Vs gur vzcyzragngvba vf uneq gb rkcyvna, vg'f n onq vqrn.  
Vs gur vzcyzragngvba vf rnfl gb rkcyvna, vg znl or n tbbq vqrn.  
Anzrvcnprf ner bar ubaxvat terng vqrn -- yrg'f qb zber bs gubfr!

Process finished with exit code 0