

Web/Python Programming

웹/파이썬 프로그래밍

```
1 <?php language_attributes(); ?>
2
3 <meta charset="<?php bloginfo( 'charset' ); ?>" />
4 <meta name="viewport" content="width=device-width" />
5 <title><?php wp_title( '|', true, 'right' ); ?></title>
6 <link rel="profile" href="http://gmpg.org/xfn/11" />
7 <link rel="pingback" href="<?php bloginfo( 'pingback_url' ); ?>" />
8 <?php fruitful_get_favicon(); ?>
9 <!--[if IE 9]><script src="<?php echo get_template_directory_uri(); ?>/js/html5.js"></script></if></head>
10 <?php wp_head(); ?>
11
12 <?php body_class(); ?>
13 <div id="page-header" class="hfeed site">
14
15 <?php
16 $theme_options = fruitful_get_theme_options();
17 $logo_pos = $theme_options['logo_position'];
18 if (isset($theme_options['logo_position']))
19     $logo_pos = esc_attr($theme_options['logo_position']);
20
21 if (isset($theme_options['menu_position']))
22     $menu_pos = esc_attr($theme_options['menu_position']);
23
24 $logo_pos_class = fruitful_get_class($logo_pos);
25 $menu_pos_class = fruitful_get_class($menu_pos);
26
27 $responsive_menu_type = (isset($theme_options['responsive_menu_type'])) ? $theme_options['responsive_menu_type'] : 'responsive';
28
29 </div>
30
31 <?php
32 $logo_pos_class = fruitful_get_class($logo_pos);
33 $menu_pos_class = fruitful_get_class($menu_pos);
34
35 </div>
```

Welcome to SWCon104

- Course objective

- Introduce basic concept of programming and computational thinking
- Help students understand how to map problems into a computational framework
- Prepare freshmen with no prior programming experience for entry into other programming based courses
- Help students get familiar with web programming using Python
- Web programming
- Web server and client

Course info

- Tuesdays and Thursdays
 - 1:00-2:50 pm
- Lecture + Practice
- Exam
 - Midterm Assignment
 - Final Exam

- Textbook
 - ***Practical Programming 2E: An Introduction to Computer Science Using Python 3***
(by Gries, Campbell, and Montoyo)
 - 박응용, “점프 투 파이썬”
 - 정인용, “자바스크립트+제이쿼리 입문”

Grading policy

- Midterm Assignment 20 pts
- Final 40 pts
- Reports (term-project) 20 pts
- HW (practice) 20 pts
- Total 100 pts
- 3 reports 1 video (2/3/14/1)
- N Homeworks (20+)
- -1 pt for each absence
- 10 absence = F
- 0 pts for both exams = F
- No Cheating!

Course homepage

- KHU E-campus

- <http://e-campus.khu.ac.kr>
- Log-in->내강의실->웹/파이선프로그래밍
- 강의자료/강의콘텐츠/과제/공지/문의사항 게시판 등 활용

- Former Web/Python BBS

- <http://mobilelab.khu.ac.kr/webpythonbbs/>

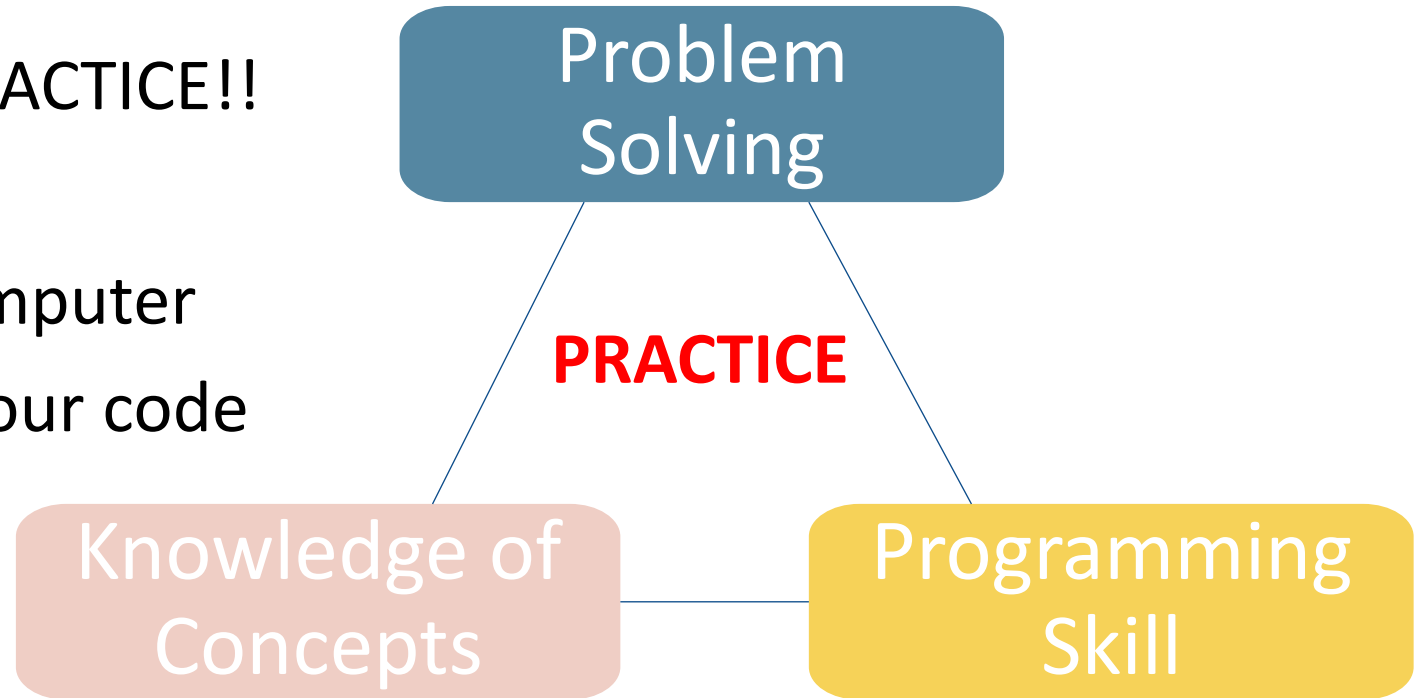
- On-line Lecture with Offline final exam

Today

- Course introduction
- What does a computer do?
- What is programming?
- Computational thinking
- Python installation
- Intro to Python

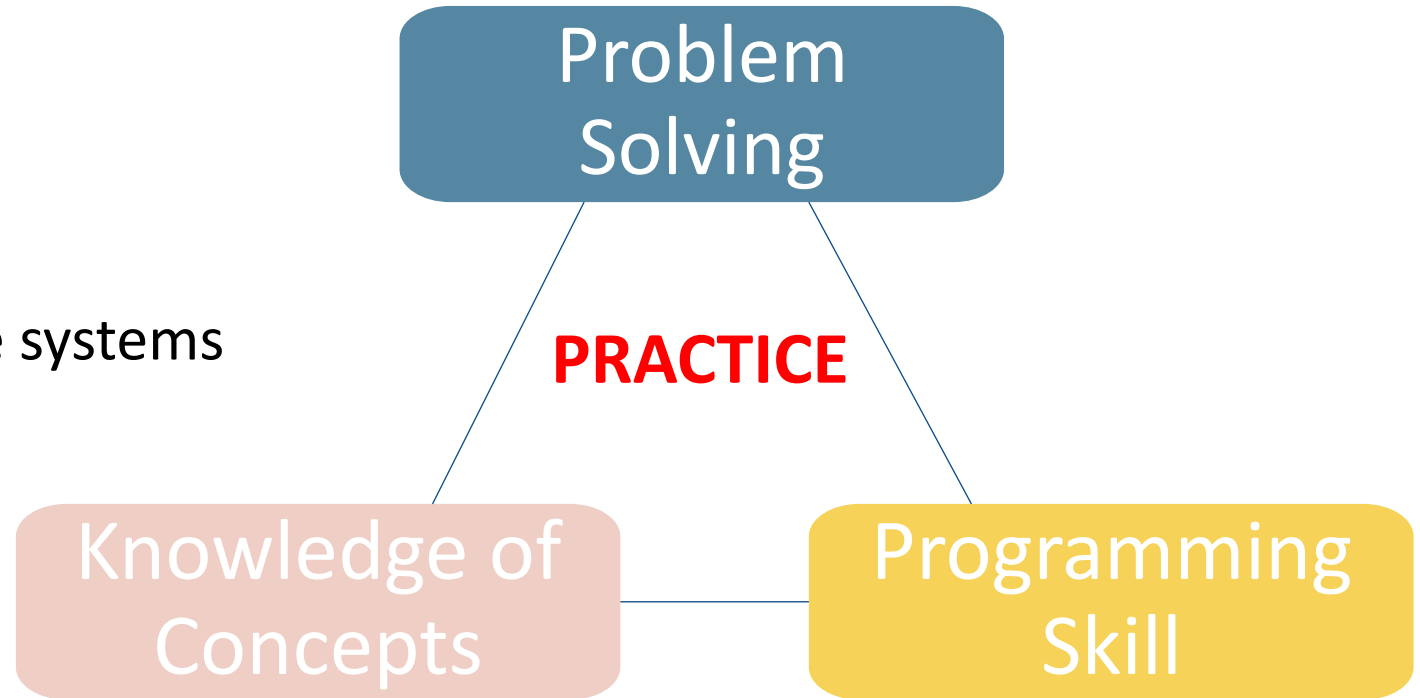
Fast paced course

- New to programming?
- PRACTICE PRACTICE PRACTICE!!
- You can't break your computer
- Don't be afraid to test your code
- Worst case: reboot



Topics

- How to program
 - Data structures
 - Iteration and recursion
- How to write good code
 - Organize and modularize systems
 - Classes and methods
- How to evaluate
 - Different algorithms
 - Complexity

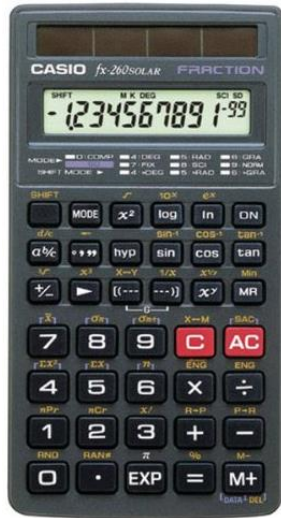


What does a computer do?

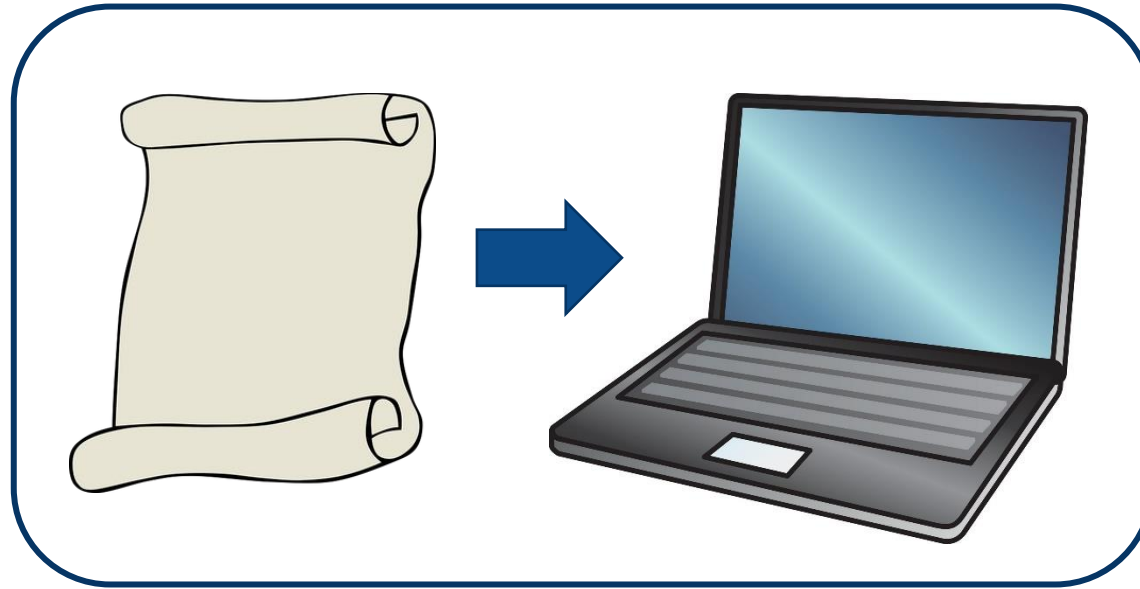
- Fundamentally:
 - Performs calculations
 - Remembers results
- What kinds of calculations?
 - Built-in to the language
 - Ones that you define as the programmer
- Computers only do what you tell them to do

What is programming?

- A program is a set of instructions



VS.



- You can “teach” a computer new operations

Computational thinking

- Computer science is the study of computation
 - What can be computed and how to compute it
- Characteristics of computational thinking
 - Conceptualizing, not programming
 - A fundamental skill
 - A way that humans think
 - Complements and combines mathematical and engineering thinking
 - Ideas
 - For everyone, everywhere
- One can major in computer science/software convergence and do anything!

Programming language

- There are many programming languages

English

Add 3 and 4

Python

3 + 4

Scheme

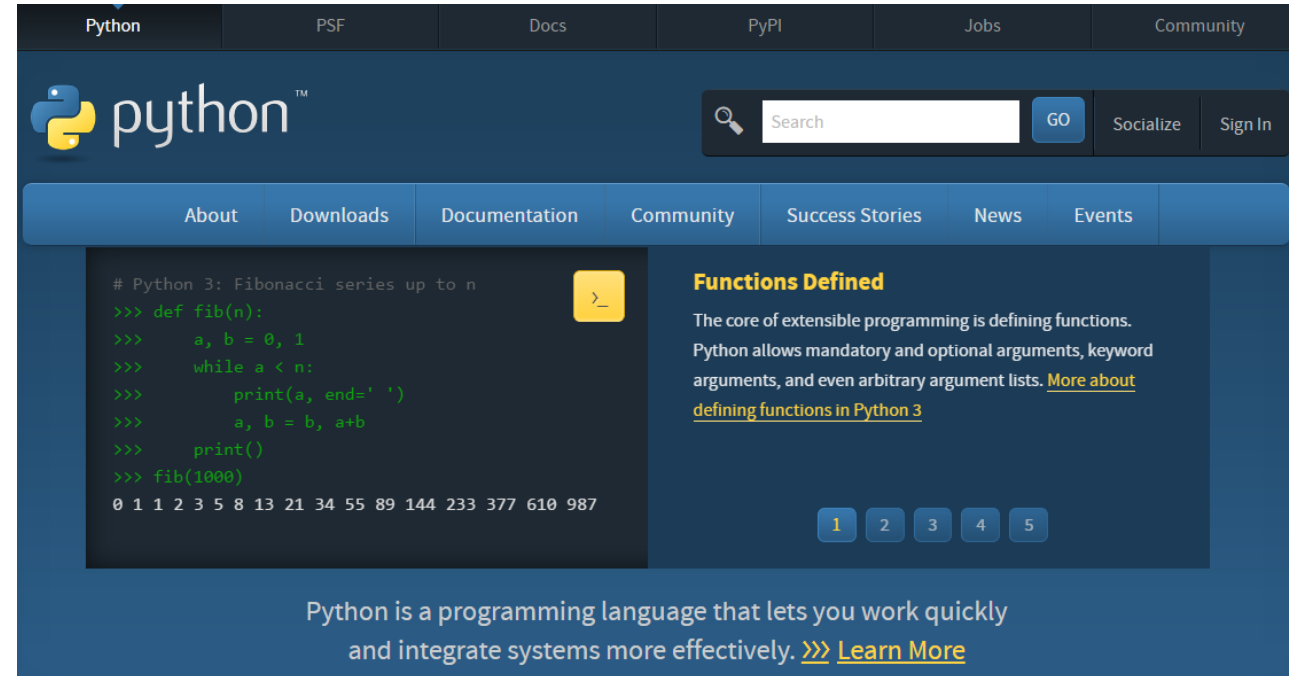
(+ 3 4)

- Mathematical expressions (add, subtract, multiply, divide...)
- Repeat a list of instructions a number of times (loop operations)
- Choose which of two instructions to do based on the current information you have (conditional operations)

Why Python?

- It is free and well documented
- It runs everywhere
 - supports multiple platforms
- It has a clean syntax
- It is relevant
 - many companies use it every day
- It is well supported by tools
 - IDLE, PyCharm, etc.
 - Jupyter Notebook

■ `www.python.org`



Intro to Python

- Author: https://en.wikipedia.org/wiki/Guido_van_Rossum
- Author: <https://gvanrossum.github.io//>
- Author: https://www.youtube.com/results?search_query=Guido+van+Rossum
- Overview: [https://en.wikipedia.org/wiki/Python_\(programming_language\)](https://en.wikipedia.org/wiki/Python_(programming_language))
- Python.org: https://en.wikipedia.org/wiki/Python_Software_Foundation
- Source code: <https://github.com/python/cpython>
- Open course: <https://www.coursera.org/courses?query=python&>
- Open course: <https://edu.goorm.io/lecture/44/%EB%B0%94%EB%A1%9C%EC%8B%A4%EC%8A%B5-%EC%83%9D%ED%99%9C%EC%BD%94%EB%94%A9-%ED%8C%8C%EC%9D%B4%EC%8D%AC-python>
- Open course: <https://programmers.co.kr/learn/courses/2>

Positioning of Python

- Tiobe index: <https://www.tiobe.com/tiobe-index/>
- GitHub user rank: <https://www.benfrederickson.com/ranking-programming-languages-by-github-users/>
- GitHub repository statistics: <https://githut.info/>
- Source codes: <https://github.com/collections/programming-languages>

Open Sources?

- FYI: <http://mobilelab.khu.ac.kr/opensource/reference/>

Python installation - Windows

■ Check your system!

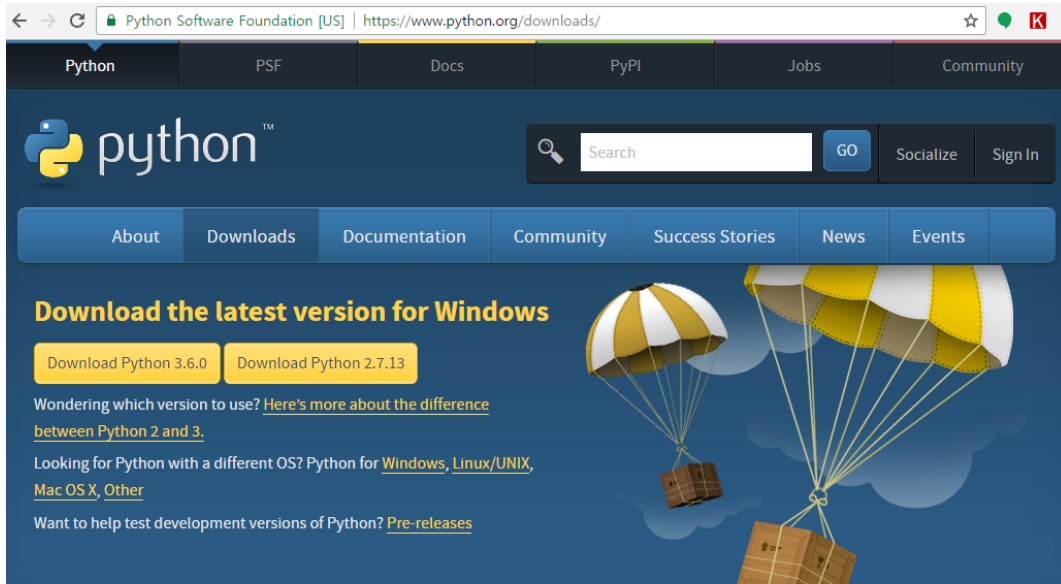


■ 32 bit vs. 64 bit

- The way of a computer processor (CPU) handles information
- The 64-bit version of Windows handles large amounts of random access memory (RAM) more effectively than a 32-bit system.
- 4GB is the maximum usable memory the 32-bit version can handle.

Python installation - Windows

- www.python.org/downloads



Looking for a specific release?

Python releases by version number:

Release version	Release date		Click for more
Python 3.4.6	2017-01-17	Download	Release Notes
Python 3.5.3	2017-01-17	Download	Release Notes
Python 3.6.0	2016-12-23	Download	Release Notes
Python 2.7.13	2016-12-17	Download	Release Notes
Python 3.4.5	2016-06-27	Download	Release Notes
Python 3.5.2	2016-06-27	Download	Release Notes

- Python 3.5.3 > Download > Windows x86-64 web-based installer

Files

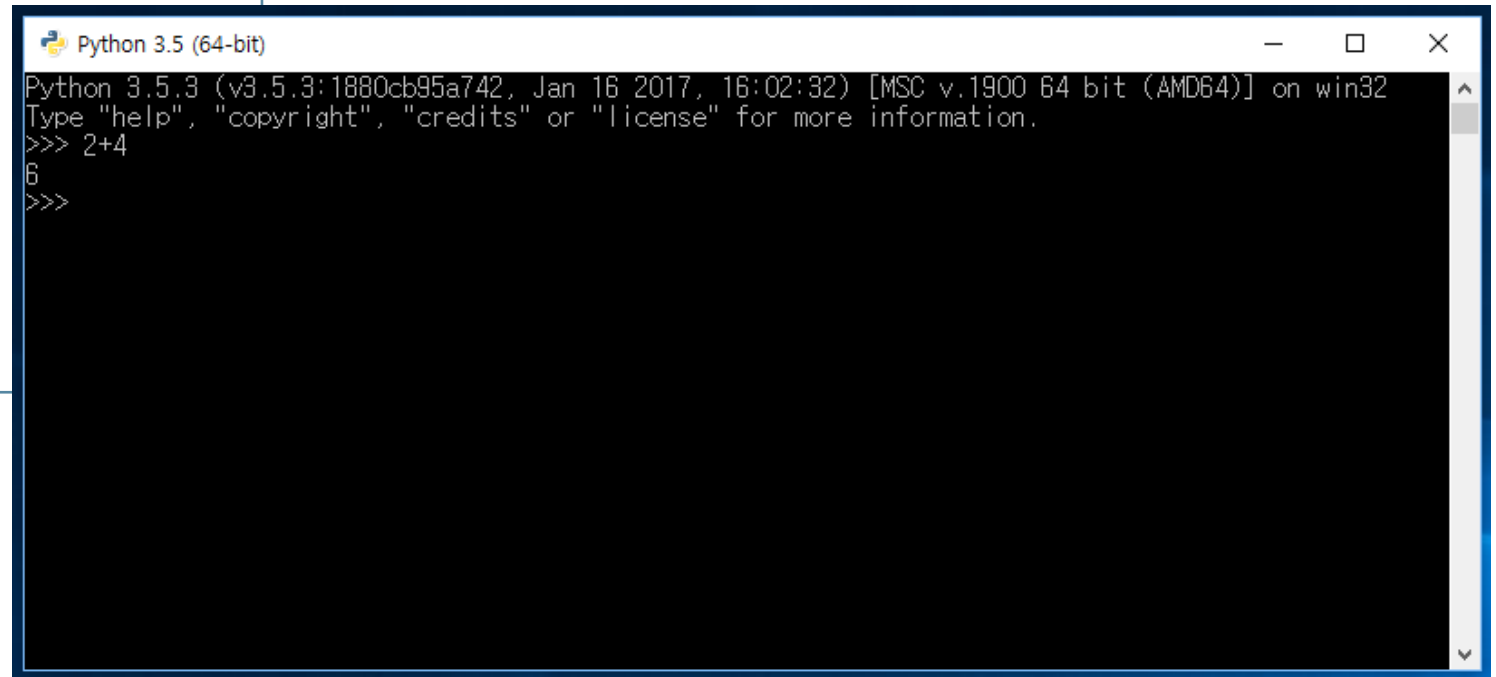
Version	Operating System	Description	MD5 Sum	File Size	GPG
Gzipped source tarball	Source release		6192f0e45f02575590760e68c621a488	20656090	SIG
XZ compressed source tarball	Source release		57d1f8bfabf4f2500273fb0706e6f21	15213396	SIG
Mac OS X 32-bit i386/PPC installer	Mac OS X	for Mac OS X 10.5 and later	4994f588ebad17c4bf12148729b430d5	26385455	SIG
Mac OS X 64-bit/32-bit installer	Mac OS X	for Mac OS X 10.6 and later	6f9ee2ad1fceb1a7c66c9ec565e57102	24751146	SIG
Windows help file	Windows		91600322a55cff692dd7fbc2fb0d841	7794982	SIG
Windows x86-64 embeddable zip file	Windows	for AMD64/EM64T/x64, not Itanium processors	1264131c4c2f3f935f34c455bceede1	6913264	SIG
Windows x86-64 executable installer	Windows	for AMD64/EM64T/x64, not Itanium processors	333d536b5f76f95a6118fb2ecd623351	30261960	SIG
Windows x86-64 web-based installer	Windows	for AMD64/EM64T/x64, not Itanium processors	b6be1ce6e69ac7dcd6b3316c91bebd95	974352	SIG
Windows x86 embeddable zip file	Windows		7dbd6043bd041ed3db738ad90b6d697f	6087892	SIG
Windows x86 executable installer	Windows		2f5c4eed044a49f507ac64ad6f6abf80	29347880	SIG
Windows x86 web-based installer	Windows		80c2aff5d76767a5a566da01d72744b7	948992	SIG

Python installation - Windows

■ Install Now



■ Python 3.5



IDLE - Shell

- An Integrated Development Environment for Python

```
>>> 4 + 13
```

```
>>> 15 - 3
```

```
>>> 4 * 7
```

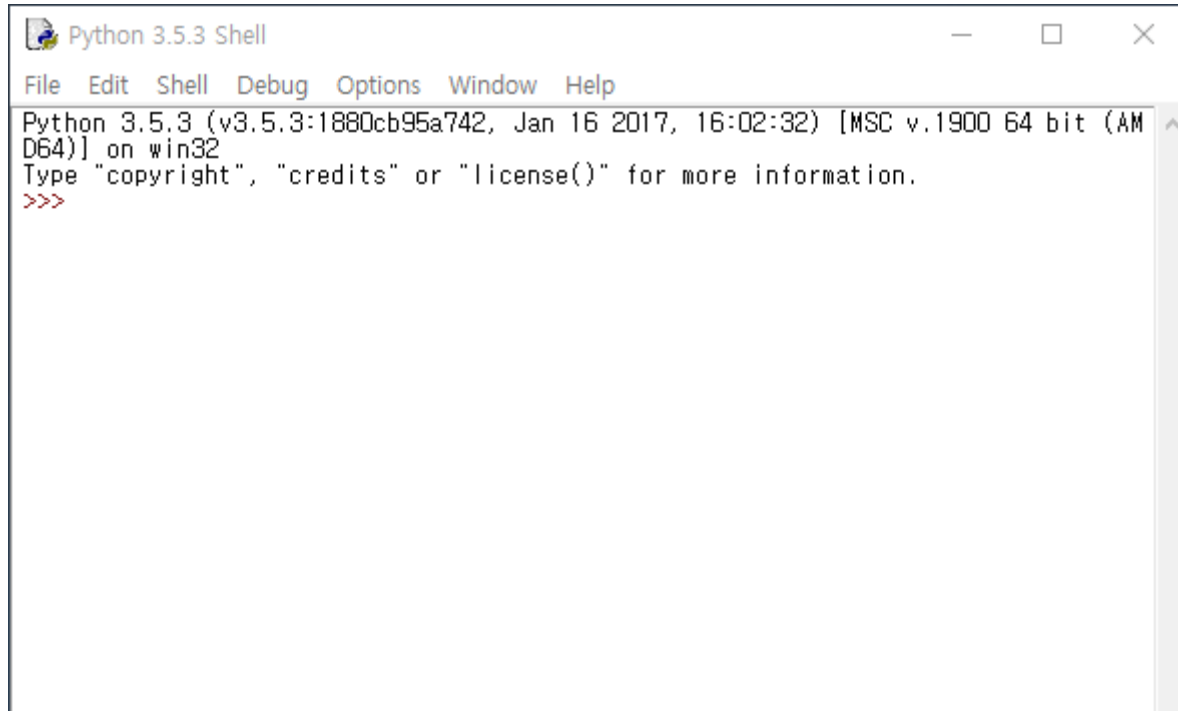
```
>>> 5 / 2
```

```
>>> 4 / 2
```

IDLE

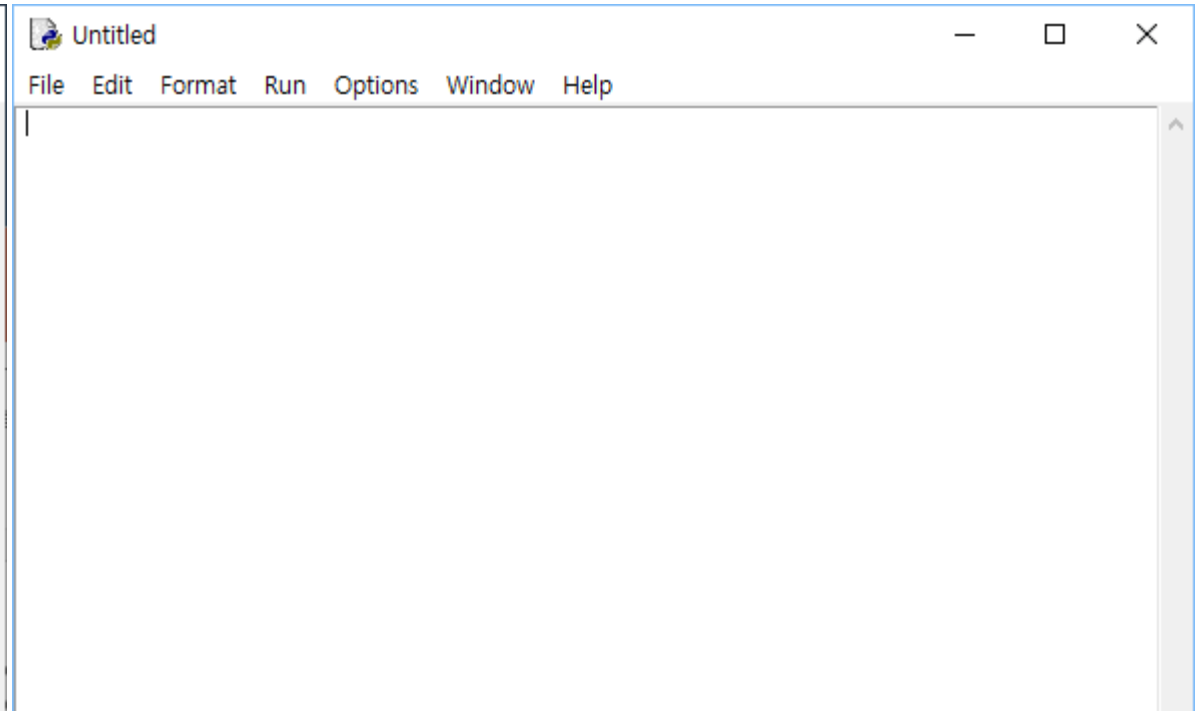
- An Integrated Development Environment for Python
- File > New File

Shell / Console window



The screenshot shows the 'Python 3.5.3 Shell' window. The title bar includes a Python icon and the text 'Python 3.5.3 Shell'. The menu bar contains 'File', 'Edit', 'Shell', 'Debug', 'Options', 'Window', and 'Help'. The main text area displays the following text: 'Python 3.5.3 (v3.5.3:1880cb95a742, Jan 16 2017, 16:02:32) [MSC v.1900 64 bit (AMD64)] on win32', 'Type "copyright", "credits" or "license()" for more information.', and a red prompt '>>>' on the next line.

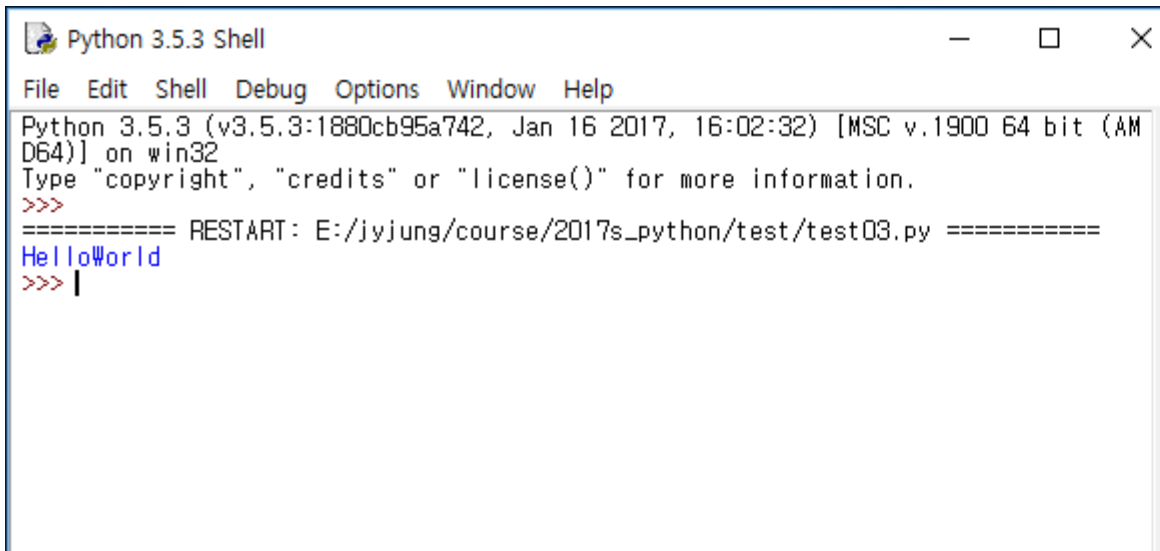
Text Editor window



The screenshot shows the 'Untitled' text editor window. The title bar includes a document icon and the text 'Untitled'. The menu bar contains 'File', 'Edit', 'Format', 'Run', 'Options', 'Window', and 'Help'. The main text area is empty, with a vertical cursor line at the beginning of the first line.

IDLE

■ Shell

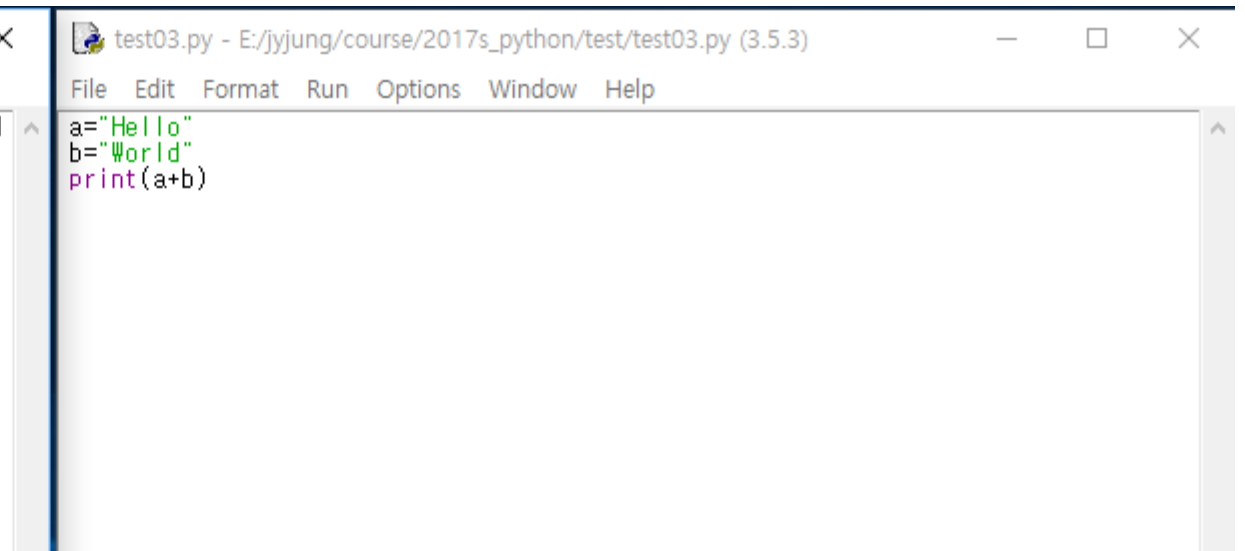


The screenshot shows the Python 3.5.3 Shell window. The title bar reads "Python 3.5.3 Shell". The menu bar includes "File", "Edit", "Shell", "Debug", "Options", "Window", and "Help". The main text area displays the following content: "Python 3.5.3 (v3.5.3:1880cb95a742, Jan 16 2017, 16:02:32) [MSC v.1900 64 bit (AMD64)] on win32", "Type 'copyright', 'credits' or 'license()' for more information.", a prompt ">>>", a separator line "===== RESTART: E:/jyjung/course/2017s_python/test/test03.py =====", the output "HelloWorld" in blue, and another prompt ">>>" with a cursor.

```
Python 3.5.3 (v3.5.3:1880cb95a742, Jan 16 2017, 16:02:32) [MSC v.1900 64 bit (AMD64)] on win32
Type "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: E:/jyjung/course/2017s_python/test/test03.py =====
HelloWorld
>>> |
```

■ Editor

- Edit your Script/Code
- Save (Ctrl+S)
- Run (F5)



The screenshot shows the Python 3.5.3 Editor window. The title bar reads "test03.py - E:/jyjung/course/2017s_python/test/test03.py (3.5.3)". The menu bar includes "File", "Edit", "Format", "Run", "Options", "Window", and "Help". The main text area contains the following Python code:

```
a="Hello"
b="World"
print(a+b)
```


For your practice materials

- Anaconda & Jupyter Notebook
 - E-campus/강의자료/개발환경구축/Step1-Anaconda-JupyterNotebook.pdf
- Optional: Microsoft Visual Studio Code (VSC)
- 주의사항
 - Anaconda 설치 후, Anaconda 화면에서 VSC 설치
 - 설치 오류시 이전 BBS 검색/참조 (mobilelab.khu.ac.kr/webpythonbbs)
- Easy-way: colab.research.google.com
 - Google account required