

Introduction to Python

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About the course

1. Basic programming know-hows
2. Elementary to Intermediate Python
 - Introductory section topics:
 - Python specific: Data basics, Functions/Class, Some useful knowledge
 - General programming: Code editor (VScode), Git/Github
 - Applications topics: Visualizaiton, Automation, Webscraping, ML/DL
3. Homework after each session

About the course

- To make the best out of the course:
 - Submit homeworks in timely manner!
 - Ask questions!

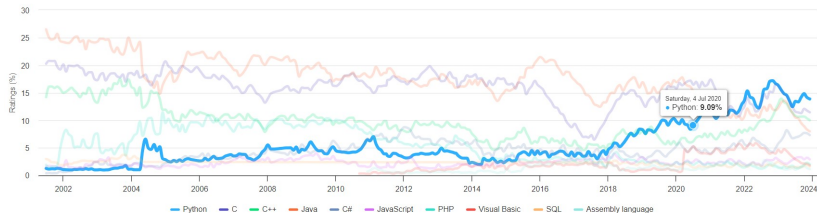
Week 1: Learning objectives

1. Background information
2. Python /Anaconda/
3. VScode, Jupyter notebook and other IDEs
4. Git & Github
5. Computer basics (Folder structures, Path, Shell)

Why Python?

TIOBE Programming Community Index

Source: www.tiobe.com

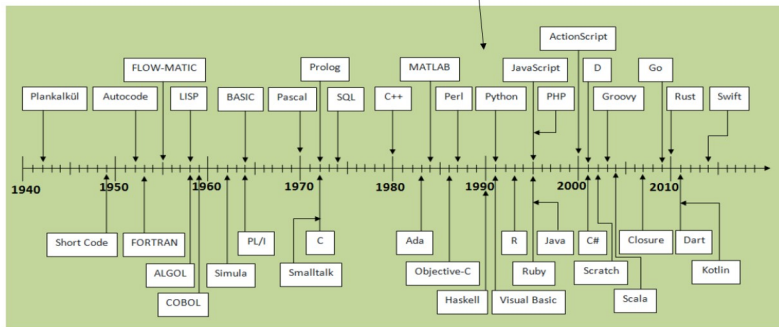


Popular applications of Python

1. Data science and data visualization
2. Machine learning & AI
3. Scientific computing (incl. Financial modelling)
4. Web & Game development
5. Desktop applications & Software & GUI
6. Automation

Python was first released in 1991

Timeline Of Programming Languages :



Source: <https://javaconceptoftheday.com/history-of-programming-languages/>

Communities and learning platforms

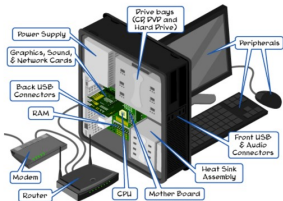
1. Python - Official
2. Stack overflow - Forum
3. Medium - Blog
4. Towardsdatascience - Blog
5. Tutorialspoint
6. Geek for geeks
7. W3schools
8. Real Python
9. Programiz
10. Kaggle - Competition and Learning resource

Guide: Must-have basics for a good programmer

- Data Structure and Algorithm
- A Version Control Tool (Git)
- One Text Editors (VScode)
- IDEs (Spyder or Pycharm)
- Database and SQL
- UNIX (Linux)
- An OOP Programming language (C++, Java or Python)
- One Scripting language (automation)
- Networking basics
- *Cloud Platform (AWS, GCP, or Azure)*
- *Containers (Docker and Kubernetes)*

Computer basics

Processor

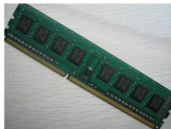


Data units

UNIT	ABBREVIATION	STORAGE
Bit	b	Binary Digit, Single 1 or 0
Nibble	-	4 bits
Byte/Octet	B	8 bits
Kilobyte	KB	1024 bytes
Megabyte	MB	1024 KB
Gigabyte	GB	1024 MB
Terabyte	TB	1024 GB
Petabyte	PB	1024 TB
Exabyte	EB	1024 PB
Zettabyte	ZB	1024 EB
Yottabyte	YB	1024 ZB

Storage units www.byte-notes.com

RAM



Hard disk



CPU (chip)



Operating systems

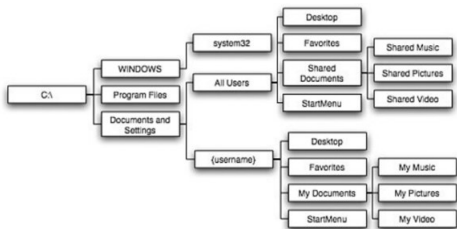
Mac, Linux,
Windows



Folder structure

Folder structure

Figure 4.7. Windows XP file structure.



Copy path:

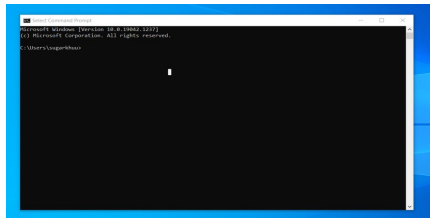
- Ctrl + L = folder path
- Shift + Right mouse > copy as path (a) = file path

When naming folder & file:

- Avoid spaces and uncommon characters
- Use either camel or snake cases

C:\Documents and Settings\sugarkhuu\My Documents\My Video

Command line interpreters/Shells

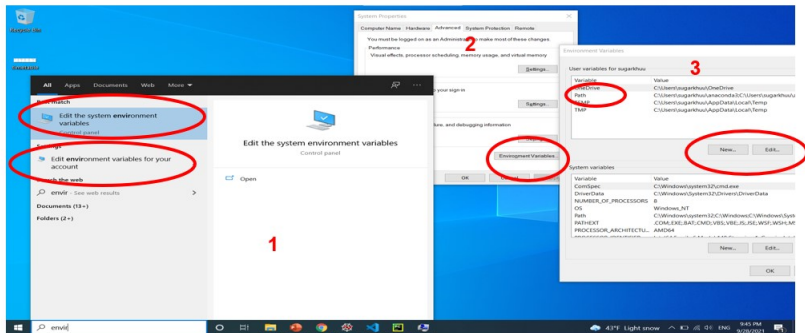


You are able to control your computer through commanding the OS from terminals (Win+CMD, Ctrl+T). More powerful and flexible than usual GUI way of doing things

- Windows: Command prompt, Powershell. More recently, Windows Terminal
- Linux: Bash
- Mac: Terminal (zsh)

Path (environment variable)

The PATH variable makes it easy to run commonly used programs located in their own folders.

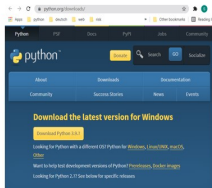


Common CMD/Bash commands

- `cd [cd]` – change directory. `/?` - help
- `dir [ls]` – directory content
- `copy [cp]` – copy file
- `ren [mv]` – rename file
- `del [rm]` – delete file
- `mkdir [mkdir]` – create new folder
- `exit [exit]` - close terminal
- `cls [ctrl+L]` – clear terminal

Getting Python

Standalone Python

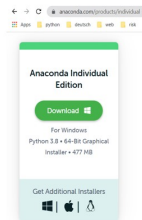


<https://www.python.org/downloads/>

Pre-installed all
packages useful
for data science



Anaconda (incl. python)



<https://www.anaconda.com/products/individual>,
<https://www.datacamp.com/community/tutorials/installing-anaconda-windows>

What is a programming language?

A programming language is a formal language comprising a set of strings that produce various kinds of machine code output.

Wikipedia

```
1  
2  
3  print("Hello Py4Econ!")  
4  
5
```

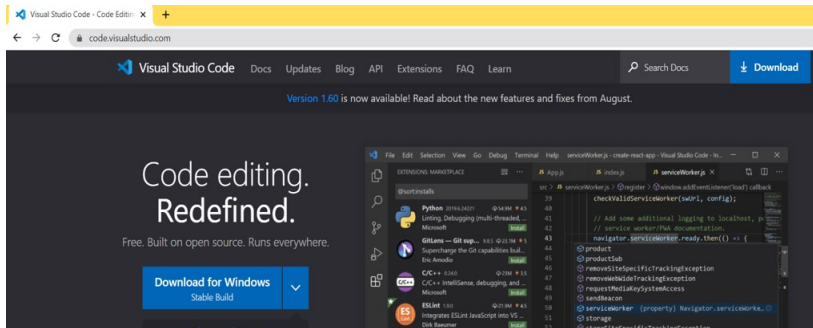
Python basic concepts for today:

- Basic syntax
- Basic operators
- Packages (+ pip)

Possible to use Python in many environments

1. Terminal
2. IDEs – Spyder or Pycharm (IntelliJ), VScode
3. Notebook - (Jupyter notebook)

Using VS code (code editor) for Python



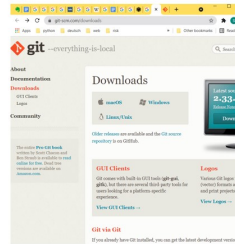
Git – Version control system (VCS)

Version control system (VCS):

Version control systems are a category of software tools that helps in recording changes made to files by keeping a track of modifications done to the code.

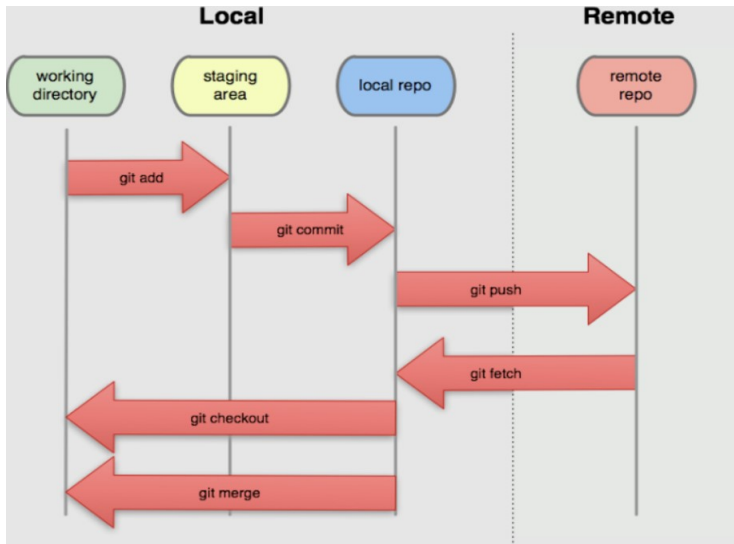
<https://www.geeksforgeeks.org/version-control-systems/>

Popular VCSs: Git, Subversion, Helix core, Microsoft TFS



<https://git-scm.com/downloads>

Git – Version control system (VCS)



Github – Share everything you want

The screenshot shows the GitHub web interface for the repository 'TheAlgorithms/Python'. At the top, there's a navigation bar with links like 'Why GitHub?', 'Team', 'Enterprise', 'Explore', 'Marketplace', and 'Pricing'. A search bar and 'Sign in'/'Sign up' buttons are also present. Below the navigation bar, the repository name 'TheAlgorithms/Python' is displayed with a 'Public' badge. To the right of the repository name are buttons for 'Sponsor', 'Notifications', 'Star' (119k), 'Fork' (31.7k), and a '31.7k' badge. Below this, there's a row of tabs: 'Code', 'Issues' (8), 'Pull requests' (33), 'Actions', 'Projects', 'Wiki', 'Security', and 'Insights'. The 'Code' tab is selected. The main content area shows the repository's file structure. It starts with a commit by 'Joe-Sin7h' (#4764) from 4 days ago, with 2,180 commits in total. Below the commit, there's a list of files and folders, each with a description and the time since the last update. The files include '.github', 'arithmetic_analysis', 'backtracking', 'bit_manipulation', 'blockchain', 'boolean_algebra', 'cellular_automata', 'ciphers', 'compression', and 'computer_vision'. To the right of the file list, there's an 'About' section titled 'All Algorithms implemented in Python'. It includes a link to 'the-algorithms.com/' and a list of tags: 'python', 'education', 'algorithm', 'practice', 'interview', 'sorting-algorithms', 'learn', 'algos', 'algorithm-competitions', 'sorts', 'hacktoberfest', 'algorithms-implemented', 'community-driven', and 'searches'. Below the tags, there's a 'Readme' section with a 'MIT License' badge. At the bottom of the 'About' section, there's a 'Releases' section stating 'No releases published'.

github.com/TheAlgorithms/Python

Why GitHub? Team Enterprise Explore Marketplace Pricing

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TheAlgorithms / Python Public

Sponsor Notifications Star 119k Fork 31.7k

Code Issues 8 Pull requests 33 Actions Projects Wiki Security Insights

master 15 branches 0 tags

Go to file Code

Joe-Sin7h Fixed #4764 (#4779) ✓ 502183 4 days ago 2,180 commits

.github	mypy --install-types --non-interactive . (#4530)	6 days ago
arithmetic_analysis	Pyupgrade to Python 3.9 (#4718)	21 days ago
backtracking	Pyupgrade to Python 3.9 (#4718)	21 days ago
bit_manipulation	Bit manipulation: get the bit at a given position (#4438)	4 months ago
blockchain	Pyupgrade to Python 3.9 (#4718)	21 days ago
boolean_algebra	Pyupgrade to Python 3.9 (#4718)	21 days ago
cellular_automata	Pyupgrade to Python 3.9 (#4718)	21 days ago
ciphers	from __future__ import annotations (#4763)	6 days ago
compression	Pyupgrade to Python 3.9 (#4718)	21 days ago
computer_vision	feat: CNN classification added to computer vision (#4350)	3 months ago

About

All Algorithms implemented in Python

the-algorithms.com/

python education algorithm practice interview sorting-algorithms learn algos algorithm-competitions sorts hacktoberfest algorithms-implemented community-driven searches

Readme

MIT License

Releases

No releases published

<https://code.visualstudio.com/>

Git bash (terminal)

A unix based commands on Windows (Emulator)



Homework

1. Task 1

2. Task 2

- Submit your result in a "Homework" github repo
- Deadline: 1 week

Task 1

1. Create a new repository in your Github
2. Clone this repository to your local machine
3. Create a python file in the local repo (in your folder)
4. In the file, write a code which asks a question and receives the answer from the user
5. Commit and push your change
6. Create 3 more questions, and commit and push

Task 2

1. Нэг компьютерт хоёр үйлдлийн систем суулгаж болох уу?
2. Path-д программаа оруулаагүй бол яах вэ?
3. Фолдерийн нэр нь дундаа зайтай байвал фолдерийг танихад ямар асуудал үүсэх вэ?
4. Git, Github хоёрын ялгаа юу вэ?
5. Commit, push хоёрын ялгаа юу вэ?
6. Push хийхээс өмнө олон дахин commit хийж болох уу?
7. Commit хийхэд github repo-д access хэрэгтэй юу?

Thank you!