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

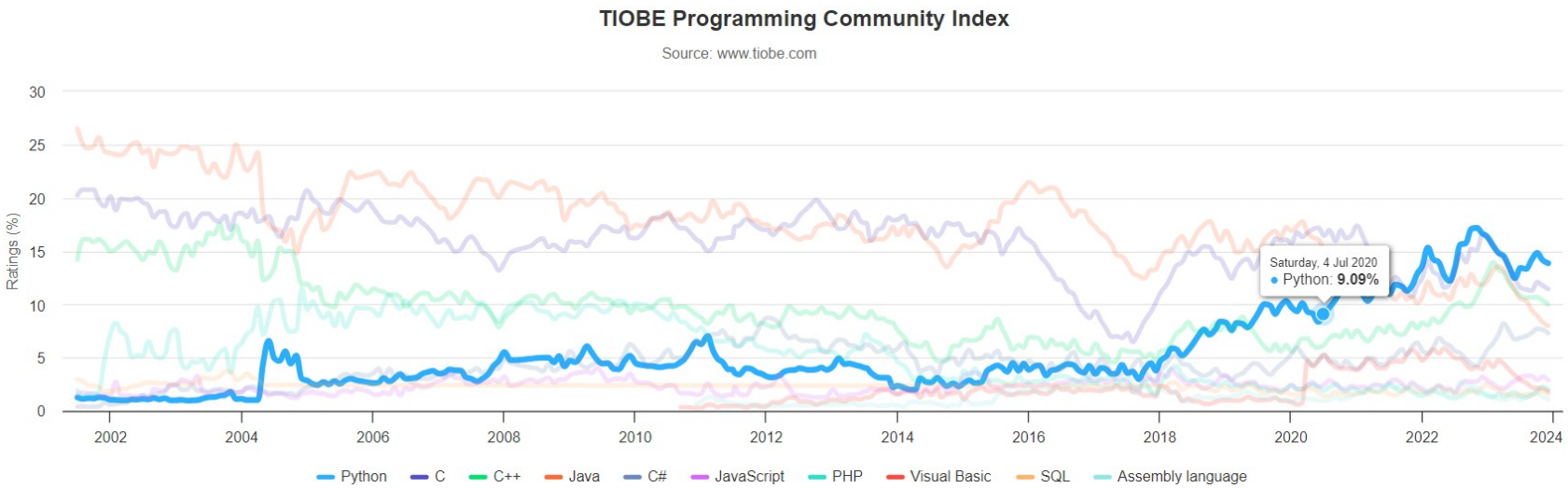
About the course

- 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)

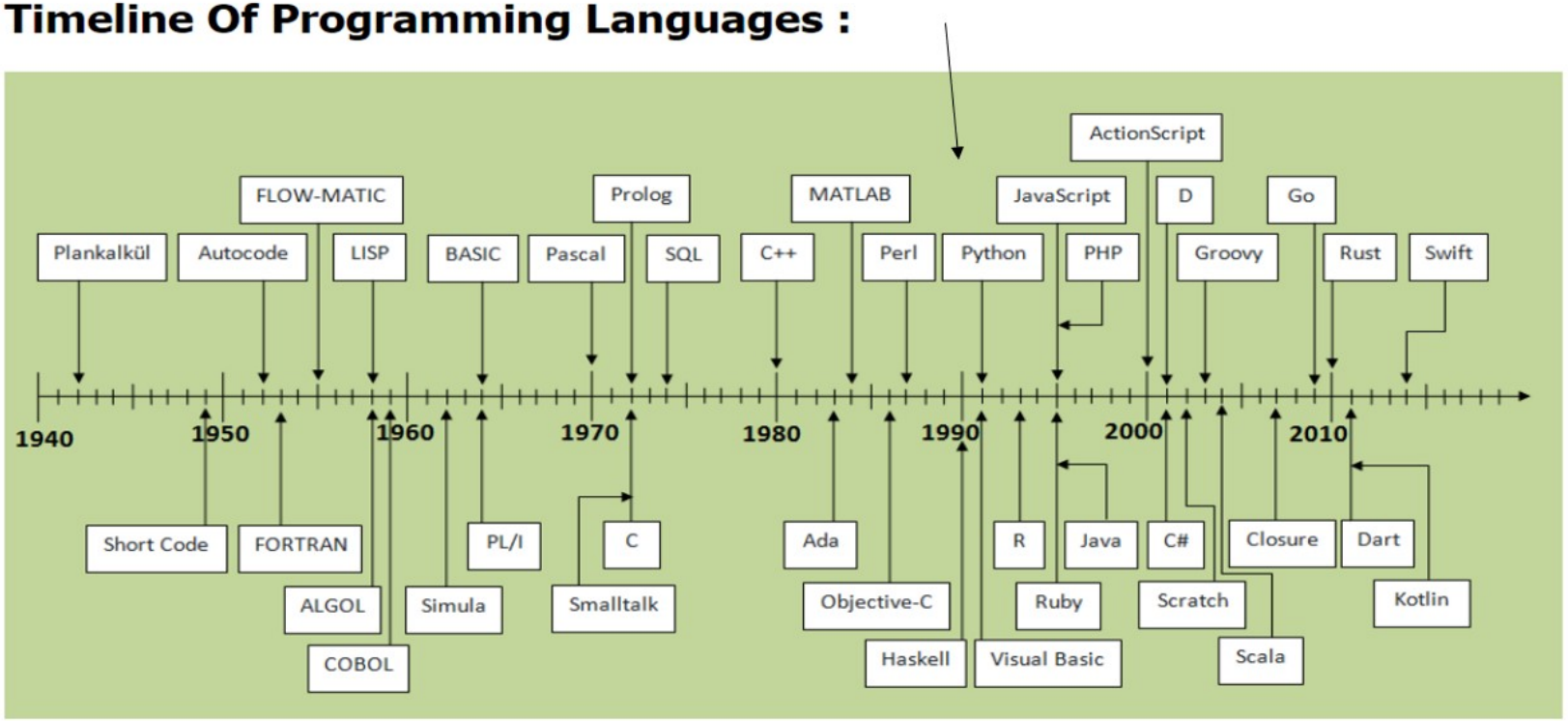
Why Python?


TIOBE Programming Community Index
Source: www.tiobe.com
Ratings (%)
30
25
20
15
10
5
0
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
2022
2024
Saturday, 4 Jul 2020
Python: 9.09%
Python
C
C++
Java
C#
JavaScript
PHP
Visual Basic
SQL
Assembly language

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



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

Communities and learning platforms

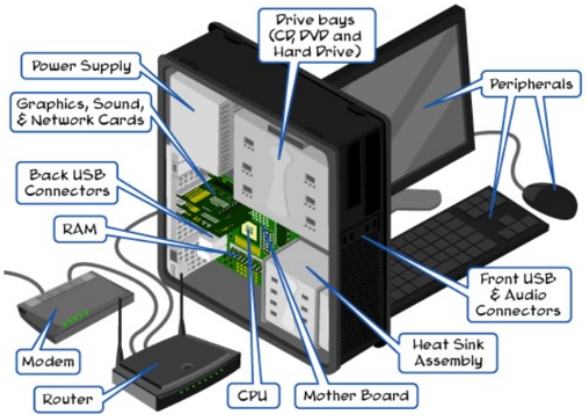
1. Python - Official
2. Stack overflow - Forum
3. Medium - Blog
4. Towardsdatascience - Blog
5. Tutorialspoint
6. Geek for geeks
7. W3schools
8. Real Python
9. Programiz
10. Kaggle - Competition and Learning resource

Guide: Must-have basics for a good programmer

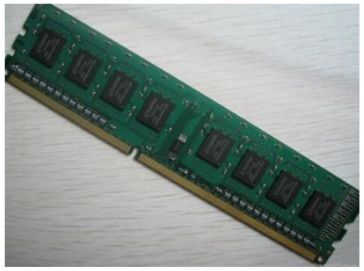
- Data Structure and Algorithm
- A Version Control Tool (Git)
- One Text Editors (VScode)
- IDEs (Spyder or Pycharm)
- Database and SQL
- UNIX (Linux)
- An OOP Programming language (C++, Java or Python)
- One Scripting language (automation)
- Networking basics
- *Cloud Platform (AWS, GCP, or Azure)*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

Computer basics

Processor



RAM



Hard disk

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

CPU (chip)

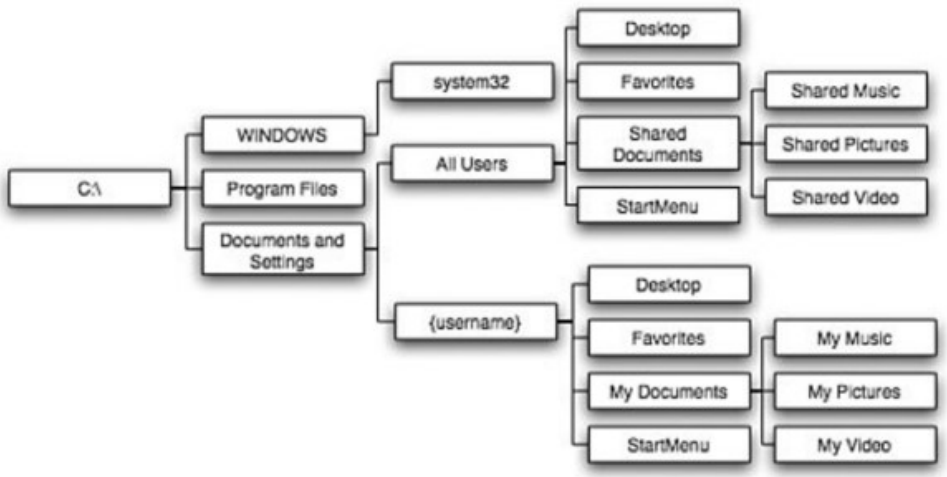
Operating systems

Mac, Linux,
Windows

Folder structure

Folder structure

Figure 4.7. Windows XP file structure.



Copy path:

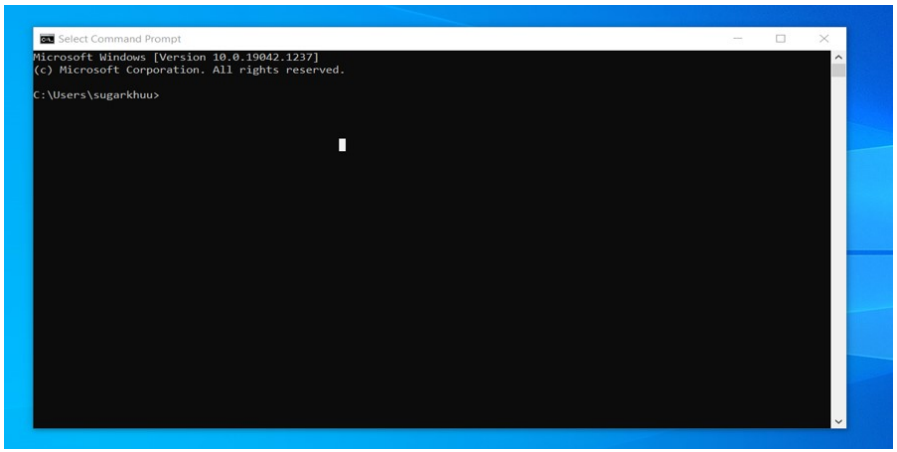
- Ctrl + L = folder path
- Shift + Right mouse > copy as path (a) = file path

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

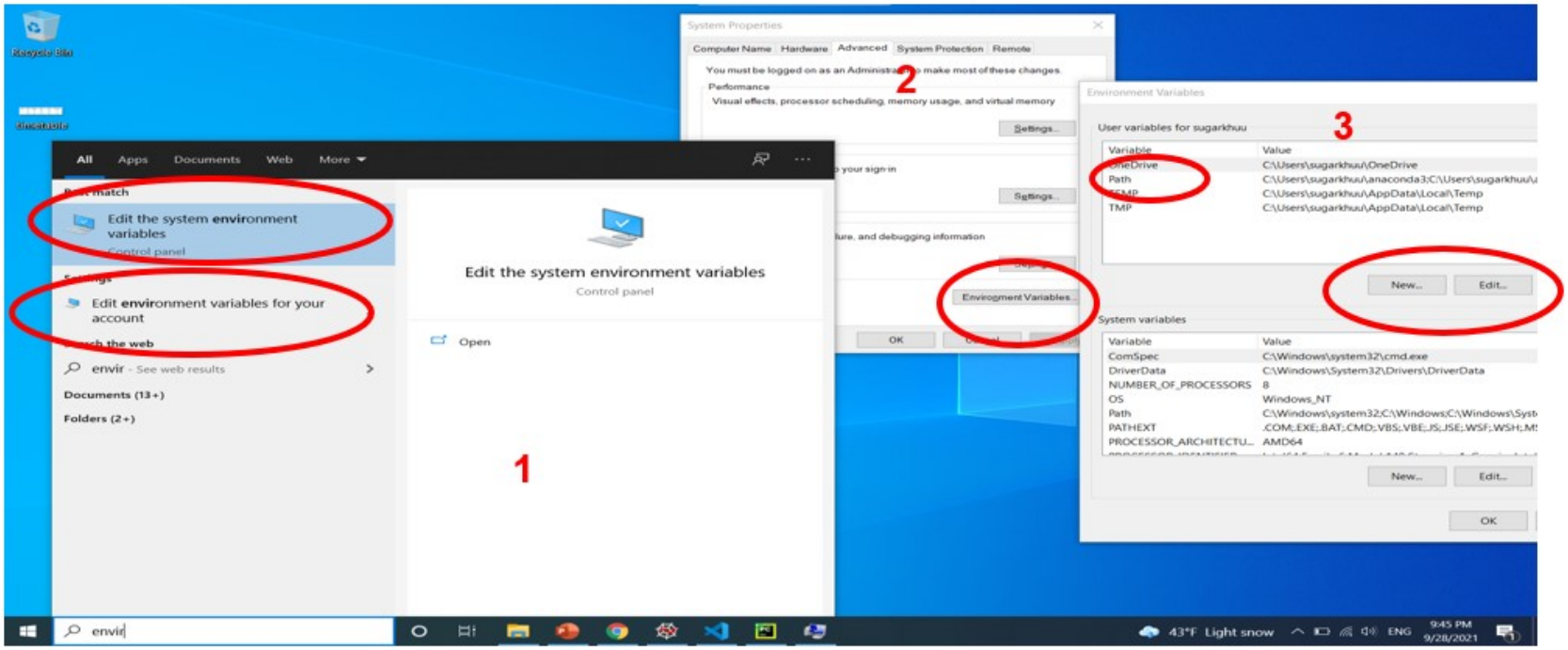


You are able to control your computer through commanding the OS from terminals (Win+CMD, Ctrl+T). More powerful and flexible than usual GUI way of doing things

- 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.

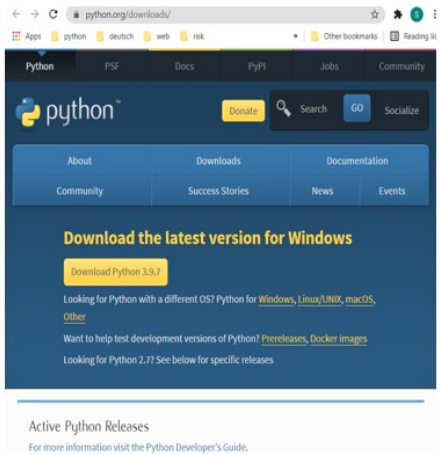


Common CMD/Bash commands

- 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

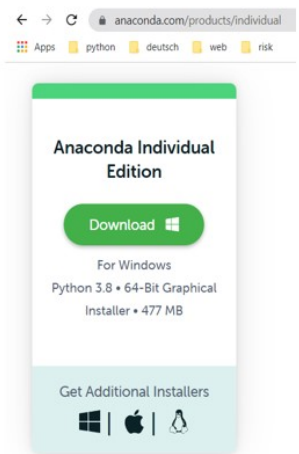


https://www.python.org/downloads/

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

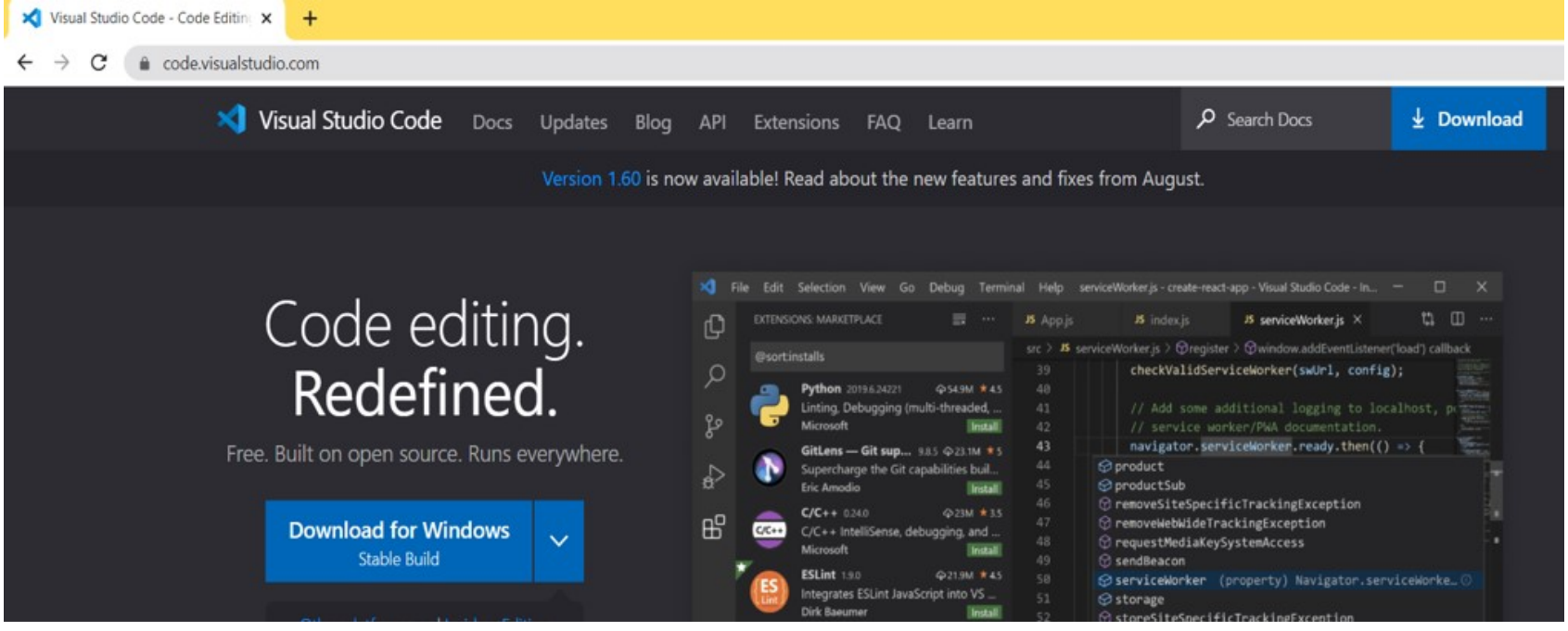
Python basic concepts for today:

- 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



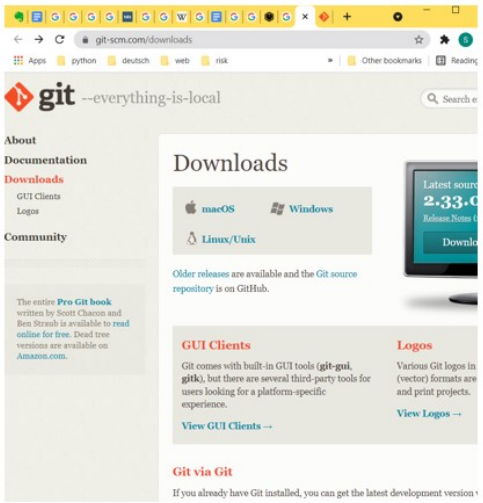
Git – Version control system (VCS)

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.

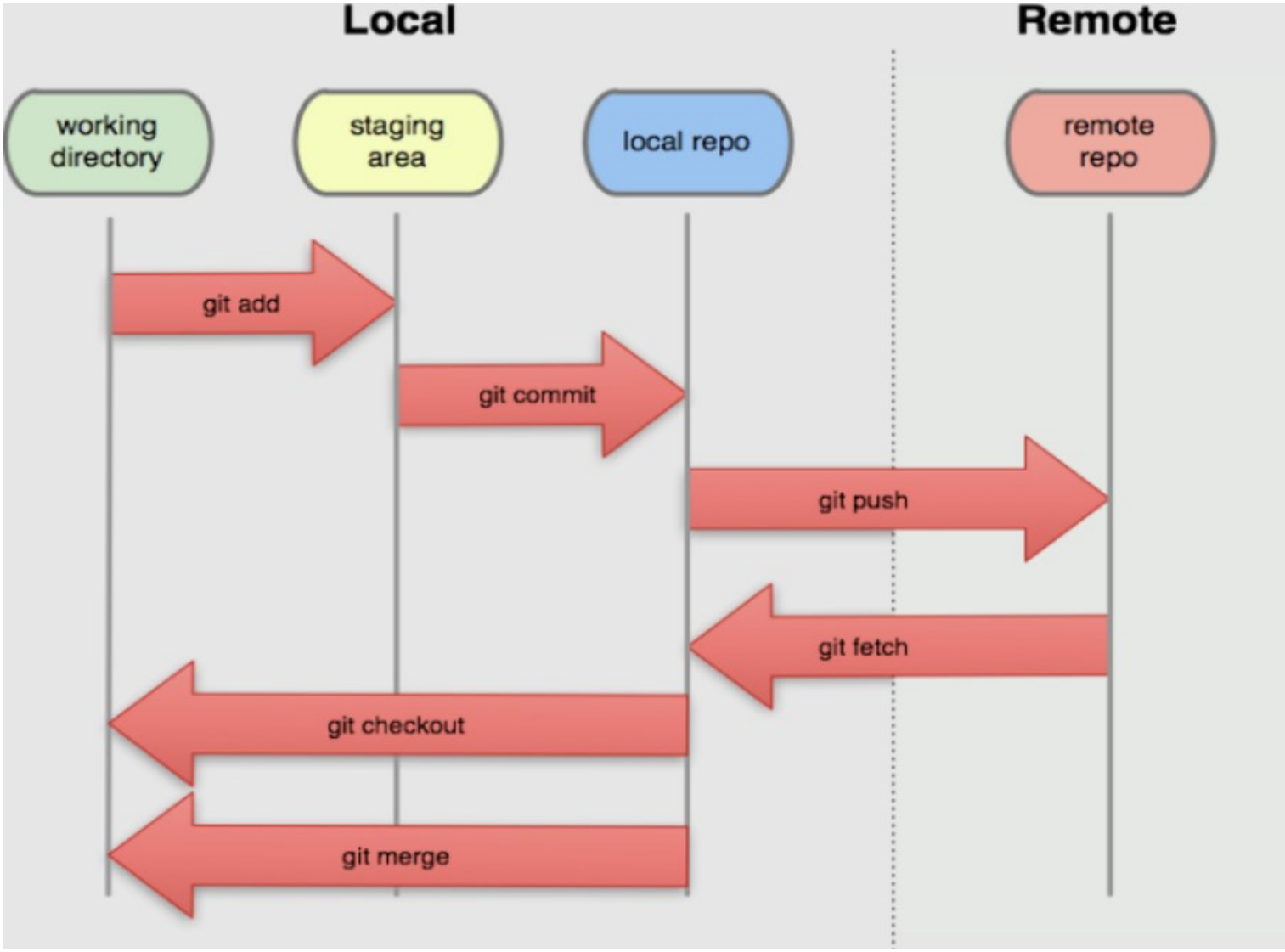
https://www.geeksforgeeks.org/version-control-systems/

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

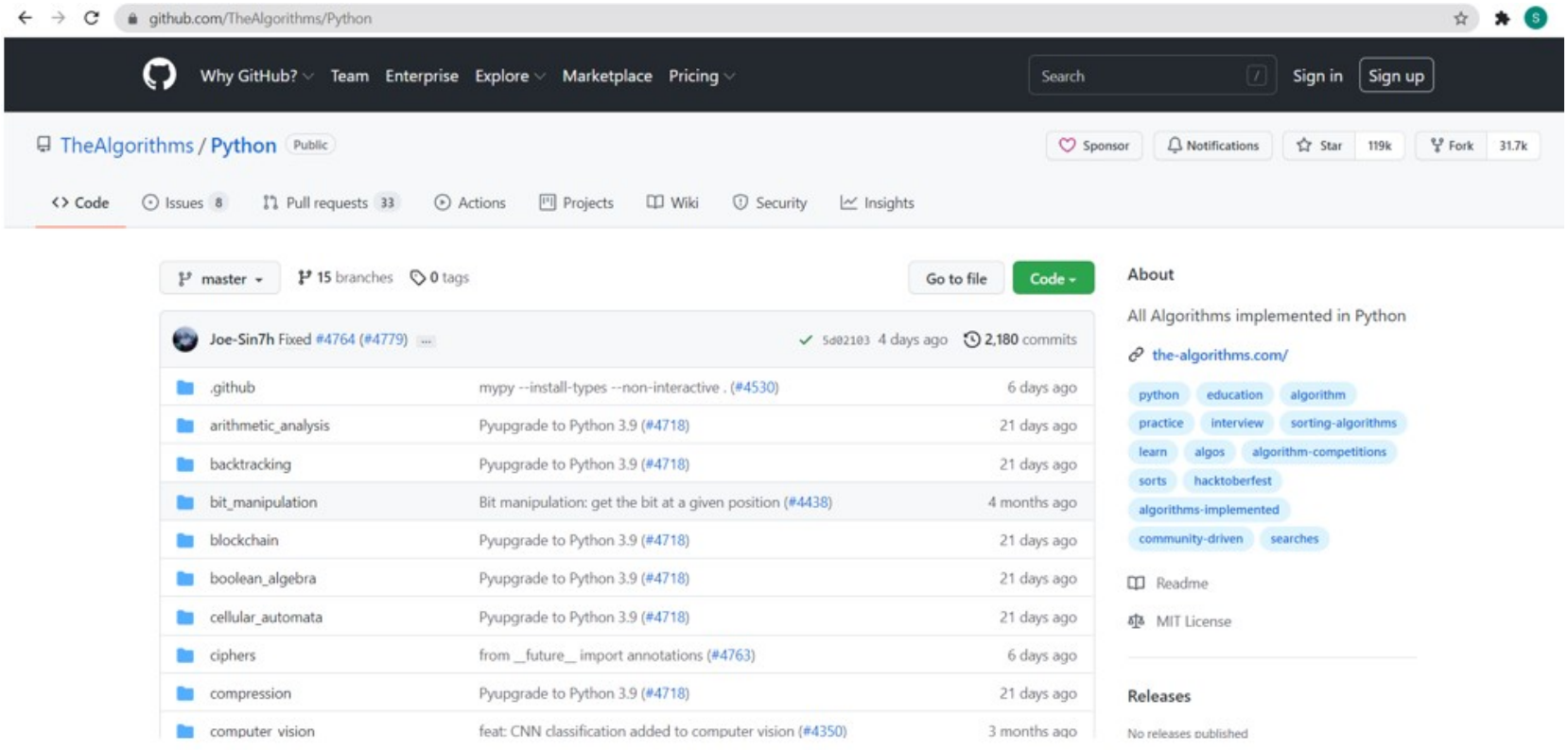


https://git-scm.com/downloads

Git – Version control system (VCS)



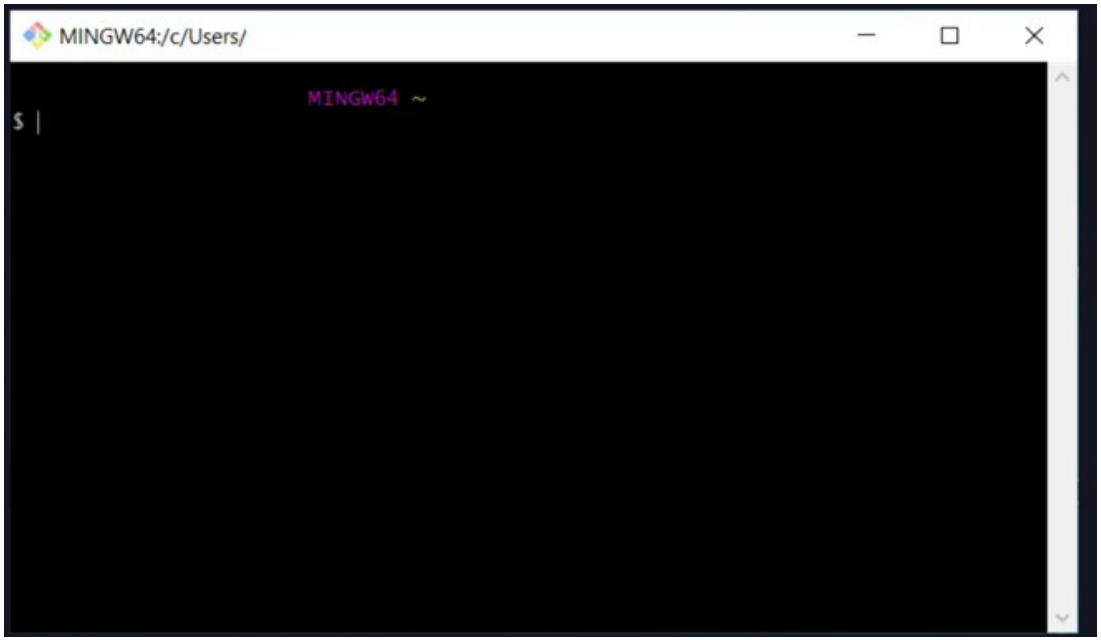
Github – Share everything you want



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!