Preparation for Class

- Class repo is at https://git.ee.ethz.ch/python-for-engineers/class-fs20.

- If anybody has NOT yet succeeded in forking the class repo and adding us as project member (minimum Reporter access level) please come talk to me or any of the assistants before the class!

- Pull in changes from the class repo to get this set of slides and today's theory and exercise notebooks:
  - execute the following statement in your Git folder:
    ```
    $ cd ~/class-fs20
    $ git pull upstream master
    ```
    then type `:wq` followed by Enter to finish merging
  - we start when everyone has succeeded in pulling today's materials

ETH zürich

Python for Engineers

- get productive in the classroom, in the lab and at home

03.03.2020 – Python Basics 1

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Content

- Repetition from Lecture 1
- Introduction to Python Programming
  - Simple and combined datatypes
  - Control flow
  - Functions
- Exercise time!

Repetition: Linux command-line

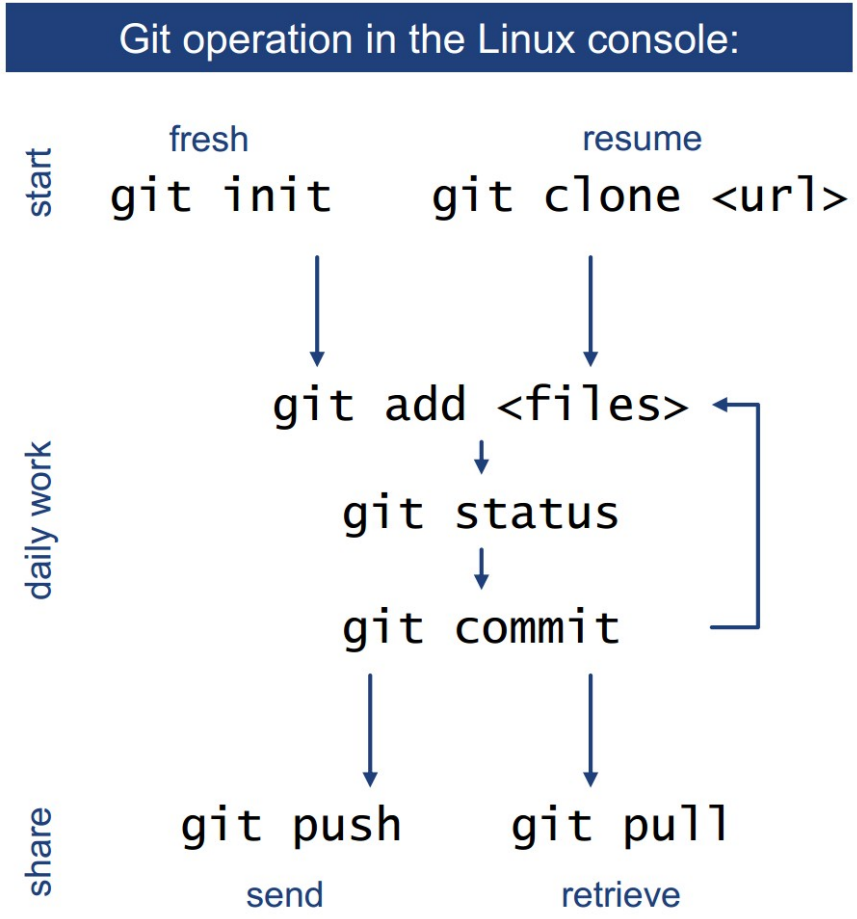
- Refer to the command manual whenever in doubt, or to the cheatsheet provided in Lecture 1.
  - `man <command-name>`

- Frequent commands:
  - `ls, pwd, mkdir, rm, top, grep, kill, ssh, cp, mv`

- Tab: autocomplete
- Ctrl-C: stop current command
- Highlight with mouse & middle mouse button: copy & paste

Repetition: Git

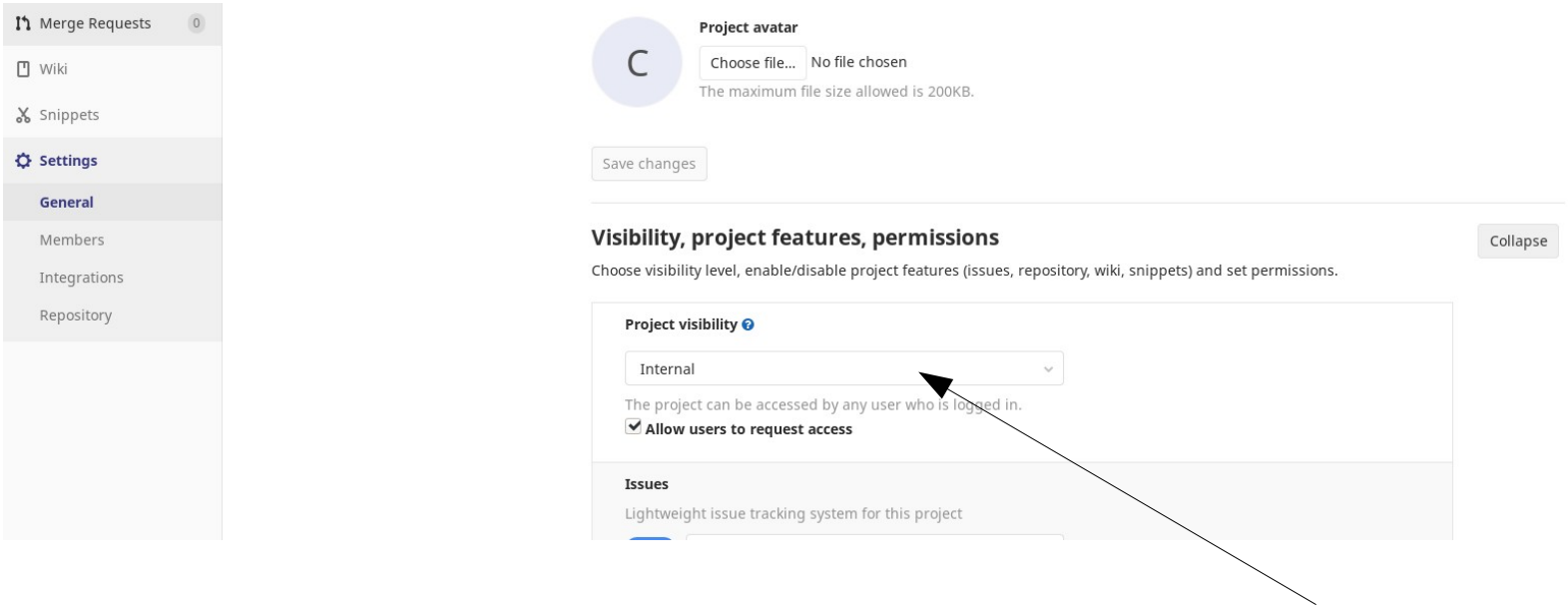
- Git is a hierarchical, decentralized source code management system.
- Keep track of changes to human-readable files
  - source code, scripts, TeX
- Keep old versions of each file with possibility to restore.
- Collaborate with others on a large scale
  - Git was devised by Linus Torvalds to coordinate work on the Linux kernel with thousands of contributors
- Fine-grained control over conflict resolutions
  - Happens all the time if you collaborate with others



Wrap-up: make your life easier

Exercise (5 min)

- Most of you have their forked projects on the GitLab https://git.ee.ethz.ch set to “internal” visibility. You might want to change this to “private”.
  - look under your project → Settings → General → Permissions



Set to private

Wrap-up: make your life easier

Exercise (5 min)

- Modify your terminal config file to define an alias:

  `$ nano ~/.bashrc` (open the config file with the nano editor)

  Then add these three lines to the end of the file:

  ```
  alias anaconda='source /usr/pack/anaconda-3-fg/anaconda3_env.sh'
  export EDITOR="nano"
  export VISUAL="nano"
  ```

  Use Ctrl+O and Ctrl+X to save and quit nano.

  - Re-open your terminal to activate the changes.
  - You can now activate the Python environment with the command

    `$ anaconda`
  - Git and other command-line tools now use the nano editor instead of vim.

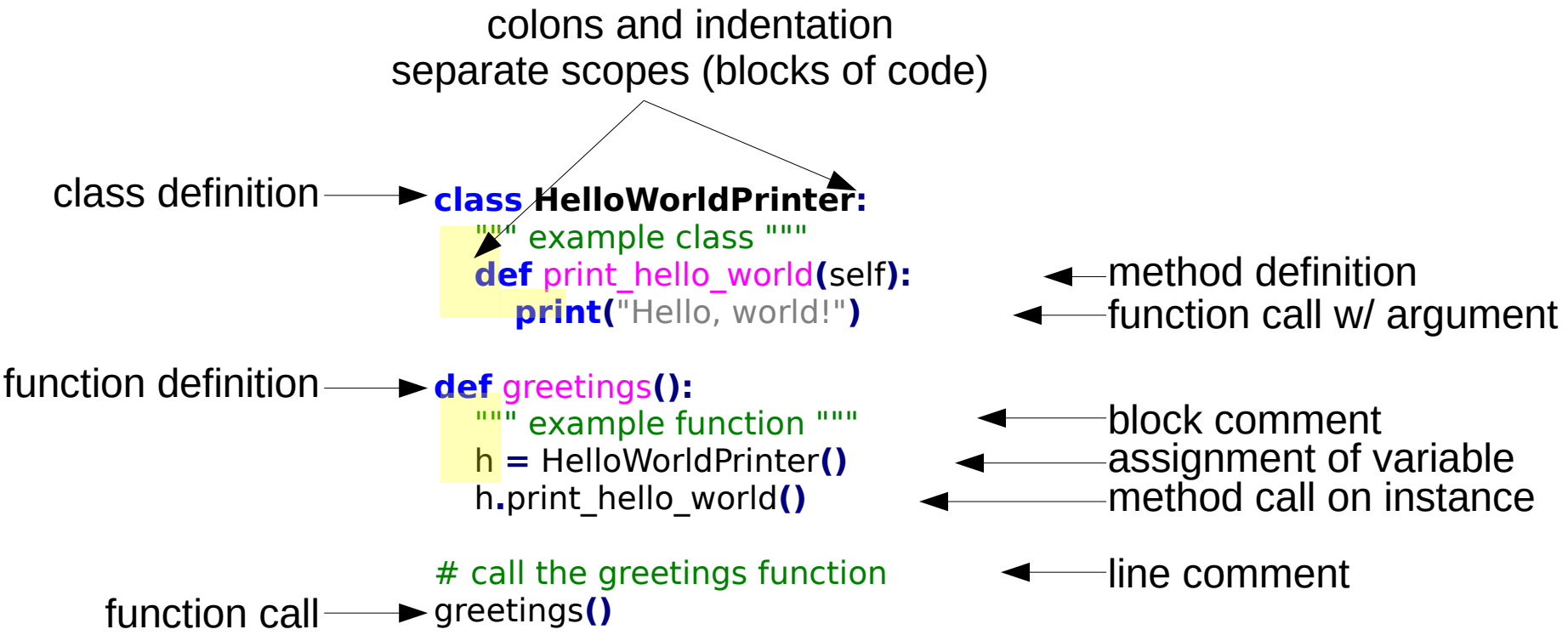
Anatomy of a piece of Python code:

```
class HelloWorldPrinter:
    """ example class """
    def print_hello_world(self):
        print("Hello, world!")

def greetings():
    """ example function """
    h = HelloWorldPrinter()
    h.print_hello_world()

# call the greetings function
greetings()
```

Anatomy of a piece of Python code:

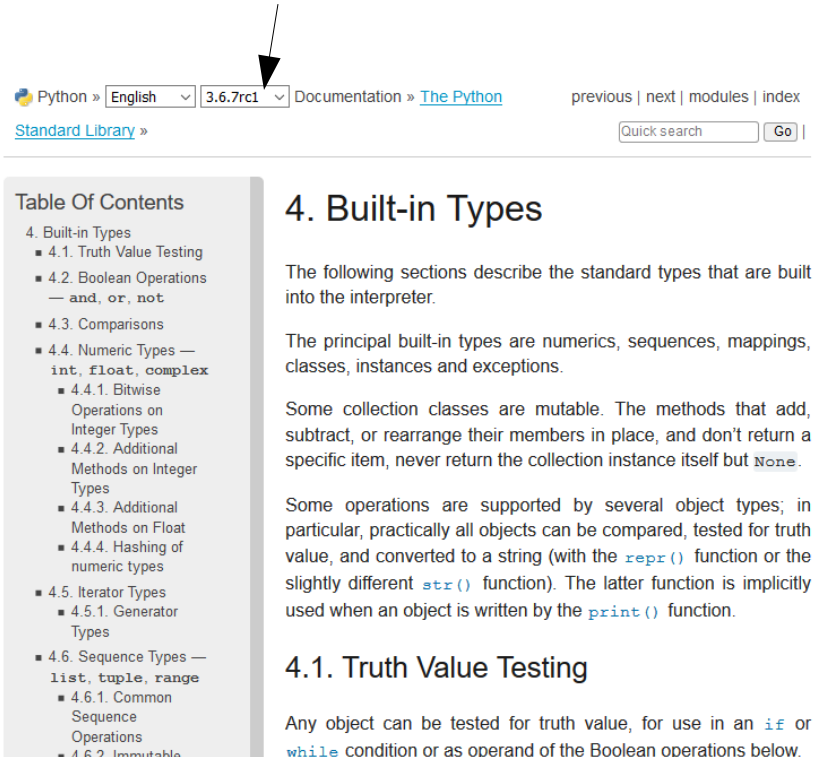


Indentation (spaces and tabs at beginning of lines matters!
A scope block is introduced with a colon :
Use # for comments.

Resources: where to get help

- Official Python documentation (actually good):
  - https://docs.python.org/

Do not forget to switch to your Python version (3.7 in our case).



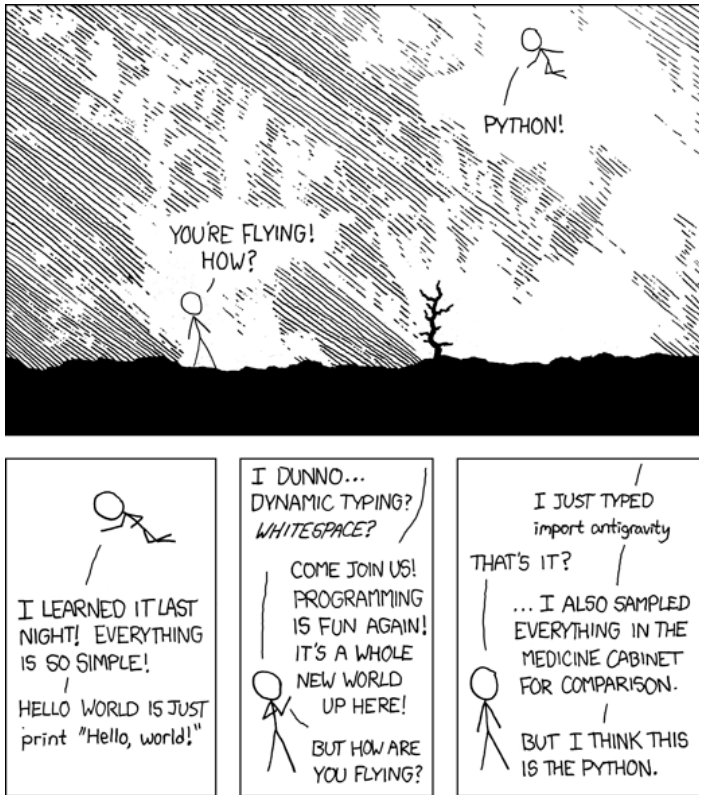
https://docs.python.org/3.6/library/stdtypes.html

- The search engine of your choice:
  - https://google.com
  - https://duckduckgo.com
  - https://swisscows.ch
  - https://startpage.com
- Stack Overflow:
  - https://stackoverflow.com
- Get help with ? in jupyter-notebook:
  - e.g. print?

Python Basics 2 – Notebook

Demo

- Don’t forget to activate the Python installation by running `anaconda` in each new terminal.
- Run `jupyter-notebook` in the Git folder.
- Class material for today is in `Lecture_02_types_conditionals/Lecture_2.ipynb`



https://www.xkcd.com/353/

Solve Exercises

Exercise

- Reminder: to get credits for this class you need to show that you have worked seriously on all provided exercises.
- Run jupyter-notebook in your folder.
  - Solve the exercises in `Lecture_02_types_conditionals/Exercise_2.ipynb`
  - Happy solving! The assistants are here to assist you.
- Take a look at the Python and jupyter-notebook cheatsheets in the lecture folder if you want.
- When you are done for today, **commit and push** your changes to your Git repository.