CS6 Practical System Skills

Fall 2019 edition

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Open questions from last lecture

15.20 Checking out remote tags

⇒ clone the repo first via `git clone`, then you can list available tags via `git tag -l`

⇒ checkout a specific tag via `git checkout tags/<tagname>`

Example:

```
git clone https://github.com/ethereum/go-ethereum.git &&
cd go-ethereum &&
git checkout tags/v1.0.2
```

15.21 git checkout --ours / --theirs in rebase

⇒ To rebase on the master run

```
git checkout feature && git rebase master
```

⇒ you can use `git checkout --ours` or `git checkout --theirs`

→ Note: Meaning of theirs/ours is flipped in rebase mode, i.e.

`--theirs`	is referring to the feature branch
`--ours`	is referring to the master branch

→ to continue the rebase if no changes are made to the commit, use `git rebase --skip`

16 Python

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16.01 What is python?

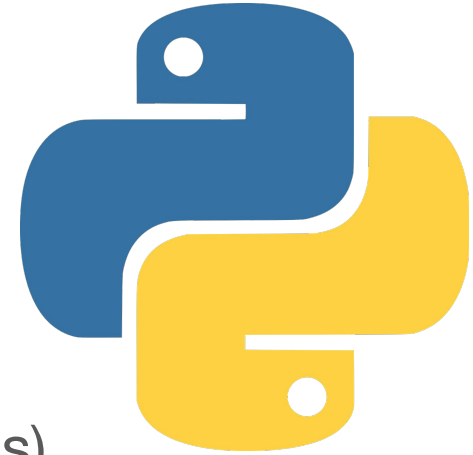
⇒ developed by Guido van Rossum in the early 1990s

→ named after Monty Python, has a snake as mascot

⇒ python is an *interpreted language*

⇒ *dynamically typed*, i.e. the type of a variable is determined during runtime

⇒ high-level language with many built-in features like lists, tuples, dictionaries (hashmaps), sets, ...



16.02 Who uses python?

Web backend	Data analysis
    + many more	    + many more

Note: An interesting talk why Instagram choose Python https://www.youtube.com/watch?v=66XoCk79kjM

16.02 Python resources

Official tutorial: https://docs.python.org/3.7/tutorial/index.html

Other useful resources:
https://www.codecademy.com/learn/learn-python-3
https://www.programiz.com/python-programming/tutorial

\+ many more available online on Udemy, Coursera, ...

16.03 Installing python

⇒ There are many python versions, we'll be using python 3.7

→ often you see code for python 2.7,
however 2.7 will be deprecated 2020

⇒ Use a package manager to install python:

- Mac OS X

```
brew install python3
```

- Ubuntu:

```
sudo apt update && sudo apt install software-properties-common &&
sudo add-apt-repository ppa:deadsnakes/ppa &&
sudo apt install python3.7
```

- Debian: https://linuxize.com/post/how-to-install-python-3-7-on-debian-9/

16.04 Working with python - how to develop code?

⇒ the python interpreter can be accessed using different ways.
Popular are

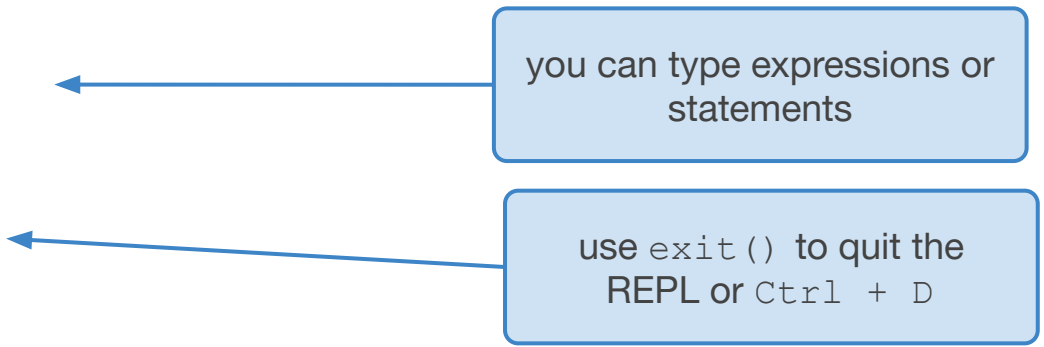
(1) **interactive mode**
entering `python3` in bash starts python3 in REPL mode,
`python3 -c "<some python3 code>"`can be used to directly execute code

(2) **file mode**
save code in a file and execute via `python3 code.py` or `./code.py` with a shebang line. There are also IDEs like pycharm to work with `.py` files

(3) **notebooks**
instead of the limited REPL, have a web interface to work like in Mathematica. Popular are jupyter notebooks or zeppelin notebooks. Many vendors also have commercial notebook offerings (IBM/Databricks/Cloudera/Google/MS/…).

16.05 python in interactive mode

```
tuxmachine:~ tux$ python3
Python 3.7.4 (default, Sep 28 2019, 16:39:19)
[Clang 11.0.0 (clang-1100.0.33.8)] on darwin
Type "help", "copyright", "credits" or "license" for more information.
>>> credits
    Thanks to CWI, CNRI, BeOpen.com, Zope Corporation and a cast of thousands
    for supporting Python development.  See www.python.org for more information.
>>> 1 + 2
3
>>> x = 17
>>> x ** 2
289
>>> exit()
```



16.06 python in file mode

```
echo -e '#!/usr/bin/env python3\nprint("hello world!")' > hw.py &&
python3 hw.py
hello world
```

execute file in python3

```
chmod +x hw.py && ./hw.py
```

specifying a shebang line allows execution via ./

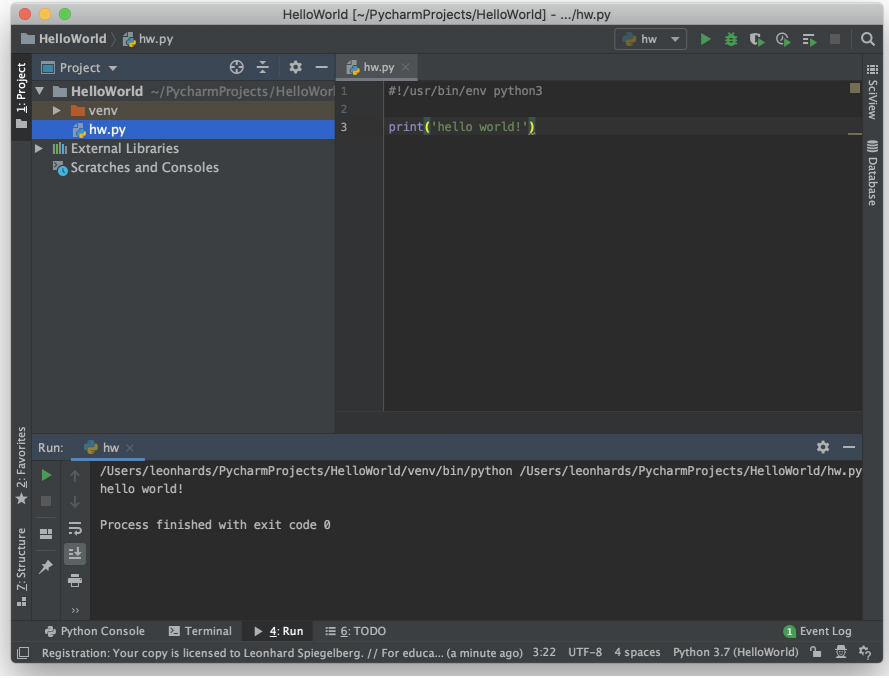
```
python3 -c 'print("hello world!")'
```

-c option to specify python program as string (works for bash too)

16.06 Python IDEs

⇒ There are multiple IDEs available for python3 development

- **PyCharm** (free for students w. Github education pack)
- Spyder
- Visual Studio with Python Tools for Visual Studio



16.07 Notebooks

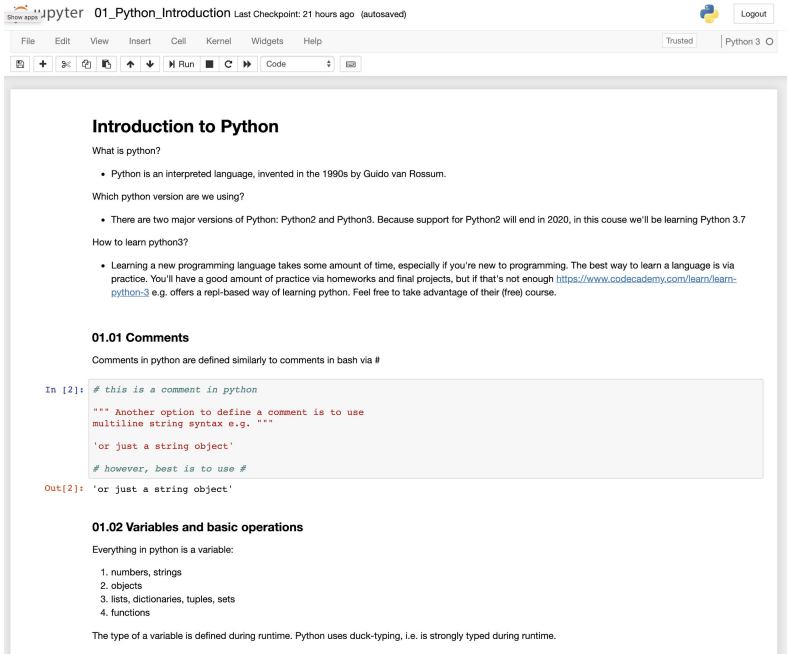
⇒ Popular (especially amongst data scientists) are notebooks

→ we'll be using jupyter notebooks

⇒ Install them via

```
pip3 install jupyter
(python package index)
```

⇒ start via `jupyter notebook` (launches notebook webui)



*intall pip via instructions on `http://pip.pypa.io` or on Ubuntu via `apt-get install python3-pip`

python3 language essentials

16.08 Time to learn some python!

⇒ best via interactive notebook!

⇒ `git clone https://github.com/browncs6/PythonIntro`

⇒ **Lab today:** Intro to Python

End of lecture.

Next class: Thu, 4pm-5:20pm @ CIT 477