Faculty of Economics and Management

Python as a tool of a modern student

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Lecture 11
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Plan for today

- plan for the rest of the term
- info about final projects (a.k.a. exam)
- info about the last session

- no jupyter notebooks today: slides and *your* coding

Please start download in the meantime:

- Python 3.14 installer >> https://www.python.org/ftp/python/3.14.0/python-3.14.0-amd64.exe
- PyCharm IDE >> https://www.jetbrains.com/pycharm/

- (if running other OS then Windows - ask me)

17.12.2025

- I need to leave early, so we will end at 17.00.
- Can we start 15min earlier, i.e. **at 15.30**?



Project = exam

- **Topic:** select any task related to your thesis, to another subject or e.g. to your hobby
- **Coverage:** the course material & min 3 discussed libraries.
- **Complexity:** appropriate, not too easy
- **Before starting:** send a brief description of the planned work for approval or adjustments

- **Submission process:**
  - brief description of your solution (formulation of the task, main solution steps, inputs/outputs)
  - functional and fully commented code
  - during meeting you will describe your solution and details of your program.

The **final grade** is determined by

1. your algorithm
2. correctness of the code
3. your understanding of the code (i.e. you know *how* it works and *why*).

Note: this is individual work! LLM… are allowed

Example: data analysis (like *quality of wine, cereals, …*)

Key steps:

- import data (from csv/xlsx or via link)
- preprocess data (remove extreme value(s) and empty records if necessary)
- preliminary analysis : main statistics, …
- visualise data … (boxplots, pairplot, …)
- optionally build a model (regression? classifier? - based on the task)
- conclusion

Where to search for data? General search, Kaggle

Example: console-based app

- text game (involving complex logic)
- manager for your finances (using either pandas or just plain python)
  - user can specify budget, regular expenses (food, rent, energy,...), special expenses (gifts, vacation, …), organize those, plot figures, …
- database of your favourite movies
  - you can add movies
  - each movie has description, duration, year, …
  - each movie can be rated

Example: GUI app

- simpler logic
- calculator, text editor, …. (more on the last session)

Live demo - how to run&work with Python

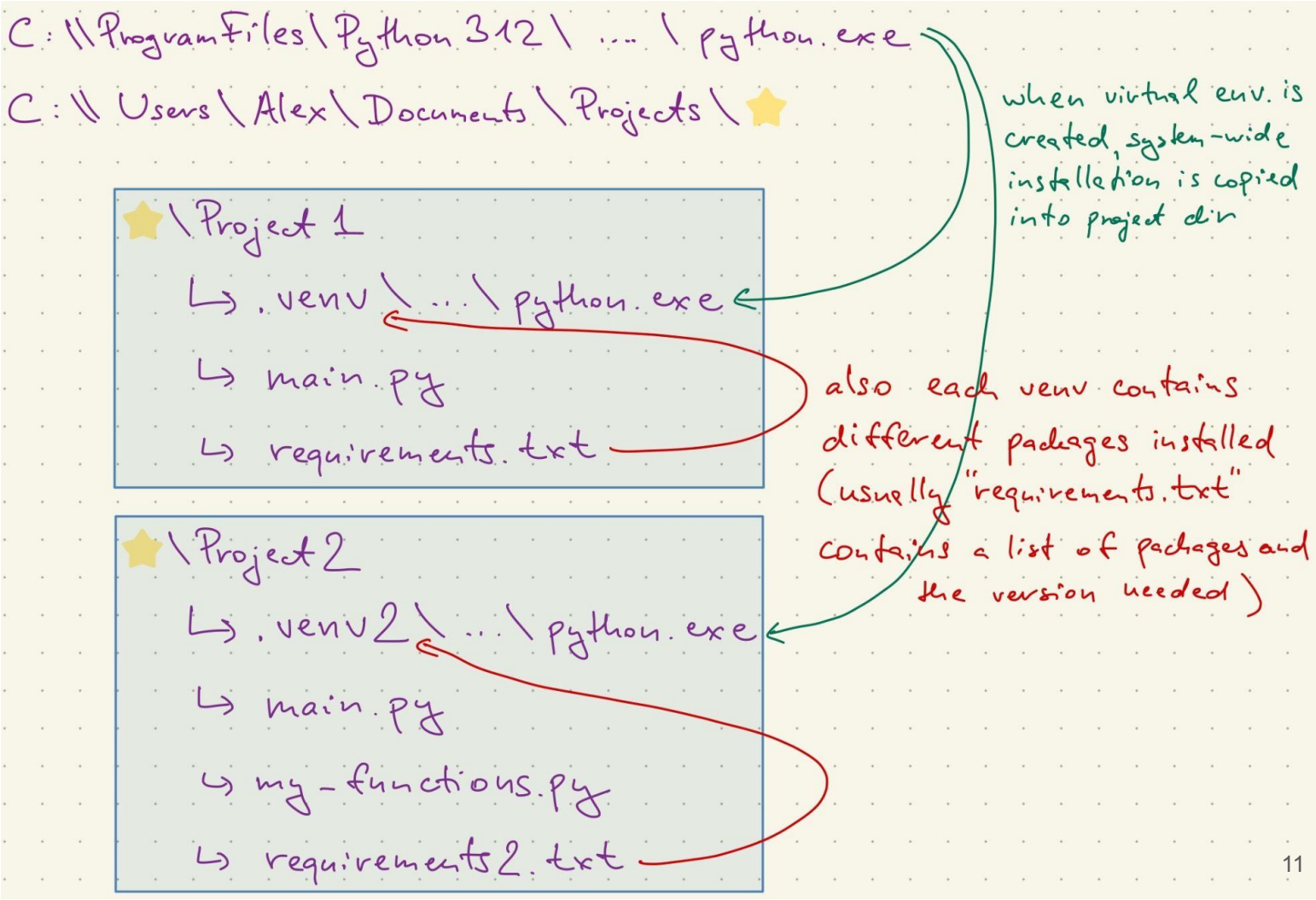
in this course we will work with: Google Colaboratory (colab.research.google.com)

- online - run in browser without installation
- needs to sign in via Google account
- convenient (same installation, free GPU), intuitive

Local installation (Python + IDE):

- installation: https://www.python.org/
- IDE = intelligent development environment: an editor with code completion, ability to run it, test it, etc. …
- ex. **PyCharm (https://www.jetbrains.com/pycharm/)**, VS Code/VS Codium, Spyder, Thonny…

Virtual environment - what is it about?


C:\Program Files\Python 312\ ... \python.exe
C:\Users\Alex\Documents\Projects\
when virtual env. is created, system-wide installation is copied into project dir
\Project 1
.venv\ ... \python.exe
main.py
requirements.txt
also each venv contains different packages installed (usually "requirements.txt" contains a list of packages and the version needed)
\Project 2
.venv2\ ... \python.exe
main.py
my-functions.py
requirements2.txt

Python - how the code is compiled?

Stage	**Python** (Interpretation)	**C++** (Compilation)
Preprocessing	No preprocessing step (comments remain)	Expands header files, removes comments, defines macros
Compilation	No compilation step; code remains human-readable	Translates C++ code to machine code specific to the CPU
Bytecode	Bytecode generated on the fly during interpretation	No bytecode; code directly compiled to machine code
Output File	Script file (main.py) remains unchanged	Executable file (e.g., main.exe on Windows)
Execution	interpreter reads and executes bytecode line by line	OS directly executes the machine code
Portability	Script can run on any system with a Python interpreter	Compiled executable might not run on other systems
Speed	Can be slower due to interpretation	Generally faster due to native machine code execution

Questions?