VISIUM

Crowd Programming

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Context and objectives

Dataset: Student Portuguese Grades

- Tabular data
- ~30 features
- ~600 examples

Objectives

- Process the data to make it usable by a model
- Develop a model that can predict portuguese grades
- Measure model performance
- [Optional]: Investigate visualizations and model explainability.
- **Teach you some stuff!!**

Tech stack

- Python
- Pandas, numpy, sklearn
- DVC
- Pipenv
- Git, pre-commit, ruff

Crowd Programming

What is Crowd Programming?

- Software development approach
- The whole team works on the same thing, at the same time, in the same space, and on the same computer
- Similar to pair-programming, but with more people involved

Workflow

- The team brainstorms together and take decisions (You + Adrien)
- One person writes actual code, implementing other people's idea (Gaétan)

How can you contribute?

- **Option 1:** Just raise your hand and share your ideas :)
- **Option 2**: Send suggestions through *Slido*

All ideas are welcome!!

DVC to structure the ML pipeline

Challenge

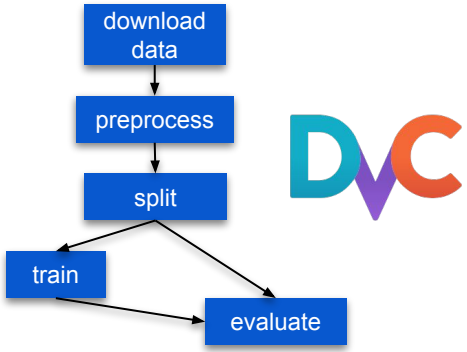
The ML pipeline coded in a notebook or a python script

- The code becomes difficult to maintain as it grows
- Notebooks do not work well with git
- Teamwork is not easy when all the code is entangled in one messy entrypoint.

Solution

Structure your code as a Pipeline

- **Maintainability.** Each step has its own responsibility and is easier to maintain.
- **Collaboration.** Easier to share responsibilities between team members
- **Efficiency.** Possibility to benefit from a cache: run steps only when necessary.
- **DVC** can help you achieve this



Pipenv to manage python environment

Challenge

The python environment is not well managed

- Python packages are difficult to install because package dependencies are not respected
- Reproducing the environment on other machines can be difficult
- Your environment is conflicting with other environment on your machine.

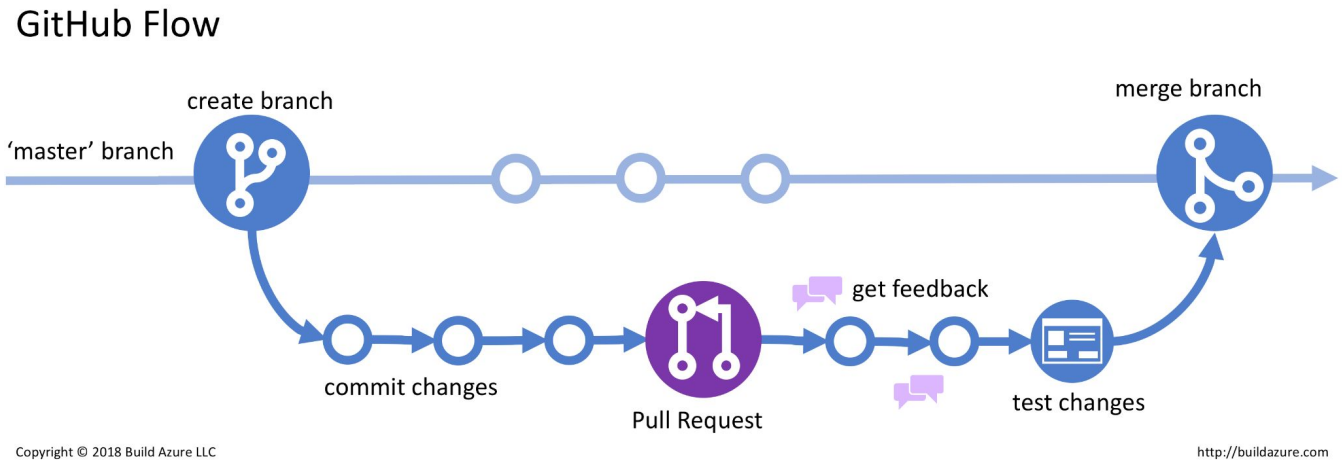
Solution

Use a modern python environment manager.

- **Dependency resolution.** The compatibility between all your packages is ensured.
- **Reproducibility.** Your environment can be reproduced everywhere with the same package versions thanks to locking.
- **Isolation.** Your environment is independent from other python projects on your machine.
- **Pipenv** will be used in this workshop.

```
$ pipenv
```

Git workflow



Tour of the code base

https://github.com/VisiumCH/crowd-programming-workshop-202404

- Where to define the ML pipeline?
- Where to define the logic of the steps?
- Where to store the data?
- Where to define my python environment?

Let's goooo!