Effective Programming Practices for Economists

Reproducible Research

What does pytask do?

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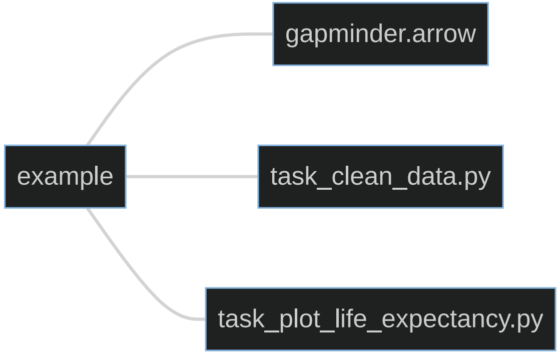
A tiny example project



- `` `example/task_clean_data.py` ``
  - Contains the function `` `task_clean_data` ``
  - If called, the function reads in `` `example/gapminder.arrow` `` and produces `` `example/bld/data.pkl` ``
- `` `example/task_plot_life_expectancy.py` ``
  - Contains the function `` `task_plot_life_expectancy` ``
  - If called, the function reads in `` `example/bld/data.pkl` `` and produces `` `example/bld/life_expectancy.svg` ``

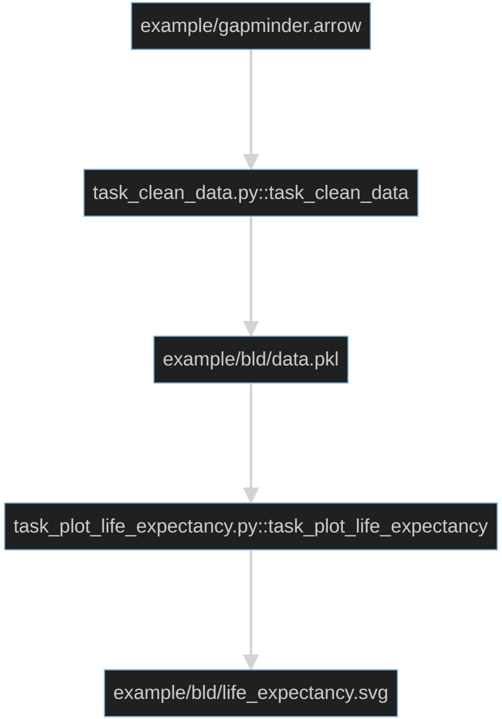
Step 1: collection

- Go through all folders in working directory
- Collect all files with name `` `task_XXX.py` ``
- Go through those files and collect all functions that start with `` `task_` ``
- Task functions and their (default) inputs will be used to construct the workflow

Step 2: Dependency graph (DAG)

- Inspect function signatures to build a dependency graph
- `` `produces` `` describes function output
- Other arguments are function dependencies
- DAG structure enables to determine an order of execution that respects dependency structure (topological sort)

Can you see the DAG?



example/gapminder.arrow

task_clean_data.py::task_clean_data

example/bld/data.pkl

task_plot_life_expectancy.py::task_plot_life_expectancy

example/bld/life_expectancy.svg

Step 3: Track changes and execute

- Pytask knows which files should need to be generated
- Also keeps track on when code or products have changed
- Functions are only run if:
  - They have changed
  - A dependency has changed
- Huge time savings in large empirical projects!

Run for the first time

Delete plot and run again

Delete cleaned data and run again