

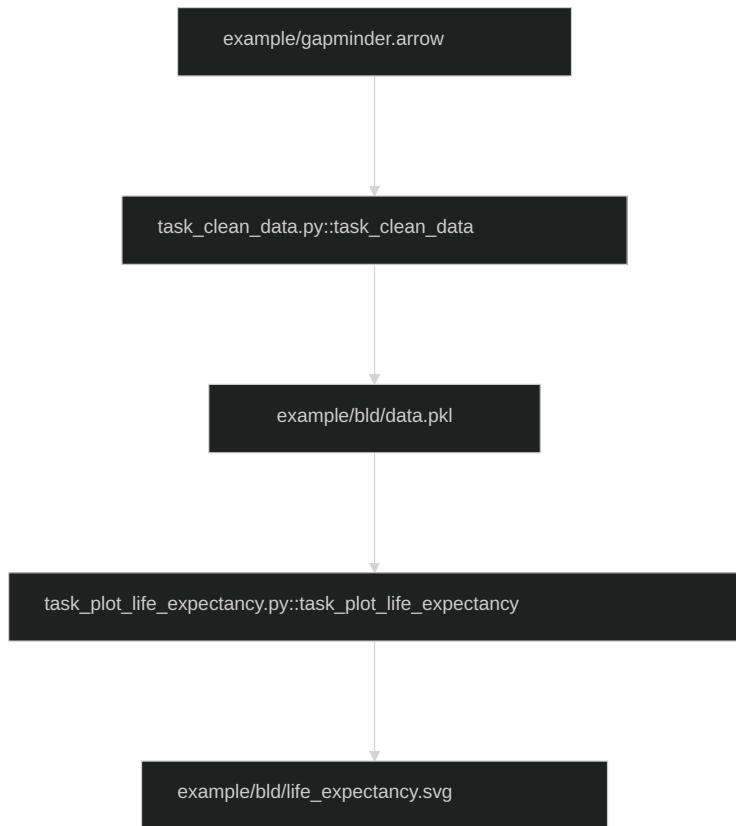
# **Effective Programming Practices for Economists**

## **Reproducible Research**

### **Writing simple (py)tasks**

Janoś Gabler and Hans-Martin von Gaudecker

# Back to the tiny example



- How do we actually write these tasks?
- How do we tell pytask what is a dependency and what is a product?
- Remember:
  - pytask looks for modules called `task_XXX.py`
  - Inside these modules, pytask looks for functions called `task_XXX`

# Contents of task\_clean\_data.py

```
from pathlib import Path

import pandas as pd

BLD = Path(__file__).parent / "bld"

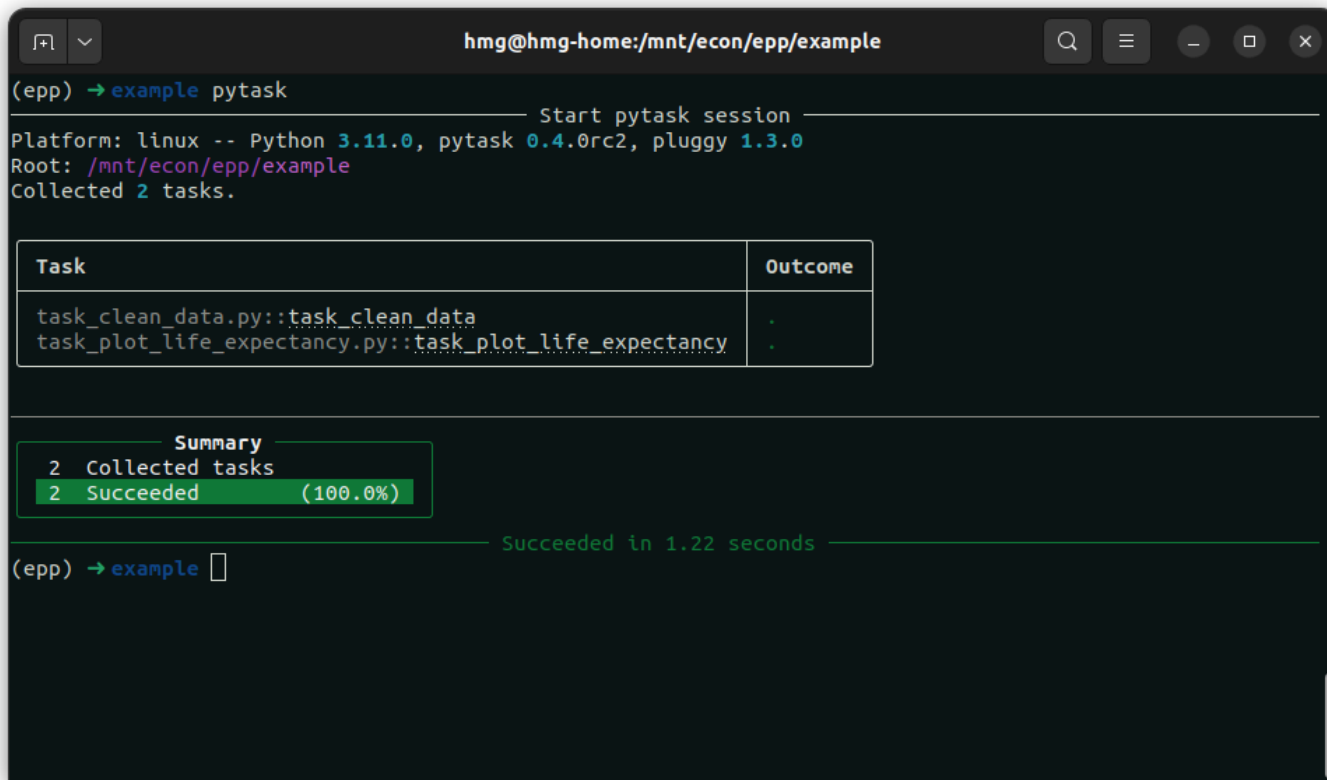
def task_clean_data(raw_file=Path("gapminder.arrow"), produces=BLD / "data.pkl"):
    raw = pd.read_feather(raw_file)
    clean = _clean_data(raw)
    clean.to_pickle(produces)

def _clean_data(raw):
    df = raw.rename(
        columns={
            "lifeExp": "life_exp",
            "gdpPercap": "gdp_per_cap",
        },
    )
    return df.query("continent == 'Asia'")
```

# Contents of task\_plot\_life\_expectancy.py

```
def task_plot_life_expectancy(  
    data_file=BLD / "data.pkl",  
    produces=BLD / "life_expectancy.svg",  
):  
    df = pd.read_pickle(data_file)  
    fig = _plot_life_expectancy(df)  
    fig.write_image(produces)  
  
def _plot_life_expectancy(df):  
    return df.plot(  
        x="year",  
        y="life_exp",  
        color="country",  
        title="Life Expectancy",  
    )
```

# Run pytask

A terminal window with a dark background. The title bar shows the path 'hmg@hmg-home:/mnt/econ/epp/example'. The prompt is '(epp) → example'. The command 'pytask' has been executed. The output shows the start of a pytask session, platform and version information, and a list of two tasks. A table summarizes the tasks, showing both succeeded. A green progress bar is visible for the 'Succeeded' row. The session ended with a success message and a return to the prompt.

```
(epp) → example pytask

----- Start pytask session -----
Platform: linux -- Python 3.11.0, pytask 0.4.0rc2, pluggy 1.3.0
Root: /mnt/econ/epp/example
Collected 2 tasks.
```

Task	Outcome
task_clean_data.py::task_clean_data	✓
task_plot_life_expectancy.py::task_plot_life_expectancy	✓

```
----- Summary -----
2 Collected tasks
2 Succeeded (100.0%)
```

```
----- Succeeded in 1.22 seconds -----
(epp) → example
```

# Basic rules

- Put tasks in modules called `task_XXX.py` , with functions `task_YYY`
- For these functions, set `pathlib.Path` objects as default arguments:
  - Default of reserved keyword `produces` for products
  - Any other default arguments become dependencies
- Inside these functions, keep structure clear:
  - Read input (usually some data)
  - Execute task (usually in a different function, potentially calling other functions)
  - Write output