

Effective Programming Practices for Economists

Installation and execution

Environment files and environments

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Environment files vs. environments

- An **environment.yml** file:
 - A recipe to create an environment
 - Under version control
 - Shared with team members
- A conda/mamba **environment**:
 - A collection of Python packages stored on your computer
 - Independent of other environments you might have
- You create an environment from an environment file by typing

```
mamba env create -f environment.yml
```

Anatomy of environment.yml

```
name: mini-env
channels:
  - conda-forge
  - nodefaults
dependencies:
  - python==3.11
  - pandas
  - pip:
    - pdbp
```

- Name can be anything, except that it must not contain spaces
- Channels: You rarely need more than conda-forge
- Dependencies: Python, list of Python packages
 - Can have equality or inequality constraints on versions
 - Only use pip for packages that are not conda/mamba installable
- Environment files should be hand-written and maintained

Dependencies installed automatically

- The mini environment from above will contain the following packages
- Most are low-level dependencies you don't have to care about
- Some exact versions are OS specific

| | |
|------------------|------------|
| _libgcc_mutex | 0.1 |
| _openmp_mutex | 4.5 |
| bzip2 | 1.0.8 |
| ca-certificates | 2023.11.17 |
| ld_impl_linux-64 | 2.40 |
| libblas | 3.9.0 |
| libcbblas | 3.9.0 |
| libffi | 3.4.2 |
| libgcc-ng | 13.2.0 |
| libgfortran-ng | 13.2.0 |
| libgfortran5 | 13.2.0 |
| libgomp | 13.2.0 |
| liblapack | 3.9.0 |
| libns1 | 2.0.1 |
| libopenblas | 0.3.25 |
| libsqlite | 3.44.2 |

| | |
|-----------------|--------------|
| numpy | 1.26.2 |
| openssl | 3.2.0 |
| pandas | 2.1.4 |
| pdbp | 1.5.0 |
| pip | 23.3.1 |
| pygments | 2.17.2 |
| python | 3.11.0 |
| python-dateutil | 2.8.2 |
| python-tzdata | 2023.3 |
| python_abi | 3.11 |
| pytz | 2023.3.post1 |
| readline | 8.2 |
| setuptools | 68.2.2 |
| six | 1.16.0 |
| tabcompleter | 1.3.0 |
| tk | 8.6.13 |

How to add a package

- Just installing packages into an environment from the shell is not reproducible
- Instead:
 - Add the package to `environment.yml`
 - Use `mamba env update -f environment.yml`
- If you have any problem:
 - `mamba env remove -n mini-env`
 - `mamba env create -f environment.yml`