

Secure Processing Environnement: Available technologies

Built on **Python 3.13**, the **secure processing environment** includes an **interactive JupyterLab**, ideal for data exploration, visualisation, modelling and reproducible collaborative work.

The pre-installed libraries and tools cover the full data analysis lifecycle:

1. Core numerics & data manipulation

- **numpy** == 1.26.4
- **pandas** == 2.2.3
- **polars** == 1.34.0
- **pyarrow** == 22.0.0
- **scipy** == 1.16.2
- **statsmodels** == 0.14.5
- **tqdm** == 4.67.1
- **pydantic** == 2.11.10
- **python-dotenv** == 1.2.1

2. Visualisation & graphical representation

- **matplotlib** == 3.10.7
- **plotly** == 6.3.1
- **seaborn** == 0.13.2

3. Notebooks & interactivity

- **JupyterLab**

4. Databases & SQL

- **sqlalchemy** == 2.0.44
- **psycopg2-binary** == 2.9.11
- **duckdb** == 1.4.1
- **connectorx** == 0.4.4

5. Machine Learning

- **scikit-learn** == 1.7.2
- **xgboost** == 3.1.1
- **lightgbm** == 4.6.0
- **imbalanced-learn** == 0.14.0

- **optuna** == 4.5.0
- **shap** == 0.49.1
- **feature-engine** == 1.9.3
- **category-encoders** == 2.8.1

This modern and complete stack lets you cover every stage of data processing: ingestion, cleaning, exploratory analysis, visualisation, modelling (supervised and unsupervised machine learning) and result interpretation.

The environment is **regularly updated** with the latest stable versions to ensure **performance**, **security** and **compatibility**.