

Course : Machine learning, from POC to production in Python

Python for data science

Practical course - 3d - 21h00 - Ref. PYD

Price : 1940 CHF E.T.



The course teaches you how to use Python for data science: preparing data, training and making the model and results available. Participants learn how to use various Python tools and libraries to perform common data science and machine learning tasks.

Teaching objectives

At the end of the training, the participant will be able to:

- ✔ Setting up the various preprocessing steps with Python
- ✔ Choosing the right model for a given problem
- ✔ Apply and evaluate models on real data
- ✔ Make a model available in the cloud and enable it to be queried via the API

Intended audience

Anyone interested in learning Python and its application to data science and machine learning.

Prerequisites

Knowledge of the Python language. Theoretical knowledge of machine learning.

Practical details

Hands-on work

The training emphasizes practical application, to ensure participants' autonomy.

Teaching methods

Designed by experts on the basis of their feedback, this course reviews the different stages of a Machine Learning project, from conception to production.

Course schedule

PARTICIPANTS

Anyone interested in learning Python and its application to data science and machine learning.

PREREQUISITES

Knowledge of the Python language. Theoretical knowledge of machine learning.

TRAINER QUALIFICATIONS

The experts leading the training are specialists in the covered subjects. They have been approved by our instructional teams for both their professional knowledge and their teaching ability, for each course they teach. They have at least five to ten years of experience in their field and hold (or have held) decision-making positions in companies.

ASSESSMENT TERMS

The trainer evaluates each participant's academic progress throughout the training using multiple choice, scenarios, hands-on work and more. Participants also complete a placement test before and after the course to measure the skills they've developed.

1 Data import and preprocessing

- Python / Anaconda / Jupyter Notebook development environment.
- Pandas: analysis of tabular data (CSV, Excel...), statistics, pivots, joins, filters.
- Handling missing values: imputation by mean, median, interpolation, knn...
- Outlier processing: graphical analysis, IQR method, Z-score.
- Standardization.
- Standardization: Skewness and Kurtosis.
- Unbalanced data: Undersampling, Oversampling, SMOTE.

Hands-on work

Handling Python in a Jupyter notebook. Practical exercise with pandas. Implementation of all pre-processing using specific Python libraries.

2 Model training and evaluation

- The most common supervised and unsupervised learning models.
- Model training with Scikit-learn.
- Evaluation methods: choosing the right metrics for each problem.

Hands-on work

Train several supervised and unsupervised models, compare performance and select the best model.

3 Model optimization and performance logging

- Presentation of the Optuna and Hyperopt libraries.
- Presentation of the Grid Search approach for identifying the best hyper-parameters in a model.
- Log hyper-parameters and performance in Mlflow.

Hands-on work

Optimization of the models developed in the previous section and logging of metrics/hyperparameters in Mlflow.

4 Model and Data Drift

- Interest in checking the Drift model and Data Drift.
- Introducing the Evidently and Streamlit libraries.

Hands-on work

Implementation of an Evidently Dashboard to monitor data drift.

5 Industrialization: deployment in the cloud

- Introduction to the AWS EC2 service.
- Introducing Flask for the for making a machine learning model available via an API.
- Presentation of various tools for connecting to the virtual environment, such as Putty, Visual Studio Code...
- Code deployment via GitHub.

Hands-on work

Deploying a model on a cloud environment with the Flask library.

TEACHING AIDS AND TECHNICAL RESOURCES

- The main teaching aids and instructional methods used in the training are audiovisual aids, documentation and course material, hands-on application exercises and corrected exercises for practical training courses, case studies and coverage of real cases for training seminars.
- At the end of each course or seminar, ORSYS provides participants with a course evaluation questionnaire that is analysed by our instructional teams.
- A check-in sheet for each half-day of attendance is provided at the end of the training, along with a course completion certificate if the trainee attended the entire session.

TERMS AND DEADLINES

Registration must be completed 24 hours before the start of the training.

ACCESSIBILITY FOR PEOPLE WITH DISABILITIES

Do you need special accessibility accommodations? Contact Mrs. Fosse, Disability Manager, at psh-accueil@orsys.fr to review your request and its feasibility.

Dates and locations

REMOTE CLASS

2026 : 18 May, 12 Oct., 25 Nov.