

Data Visualisation and Dashboards in Excel

Core Excel charts with an optional Python and xlwings extension

FA-0763 · 1 day core; 3 days including the Python extension

Data & Analytics · Software Development · Automation, RPA & Power Platform

Introduction

Design an Excel dashboard that presents a prepared dataset clearly using charts, filters and slicers. The one-day core focuses on conventional workbook analysis and visual presentation.

An optional two-day extension introduces local Python, pandas and xlwings for data preparation, plots and workbook automation, making the full programme three days. This is distinct from Microsoft cloud-based Python in Excel.

Learning outcomes

- Choose suitable chart types for the question and dataset.
- Combine charts and filters/slicers into a usable dashboard.
- Present cumulative, drill-down and segmented views where the data supports them.
- In the extension, manipulate sample data with pandas and transfer values between Python and Excel.
- In the extension, automate selected workbook tasks and add Python-generated plots.
- On the supported Windows UDF track, create small NumPy/pandas user-defined functions and document their behaviour.

Prerequisites

- Licensed copy of Excel
- Experience in using Excel for querying and manipulating data

- Basic scripting in Excel
- Experience and understanding of filing system
- Internet connection
- Basic education in mathematics (understanding of linear and non-linear mathematics at high-school level)

The optional track requires a supported desktop Excel installation, compatible Python/xlwings packages and approved macro/add-in settings. Complete xlwings UDF practice requires Windows; macOS does not support that UDF feature.

Training outline

1. Core day — Excel dashboard foundations

- Overview
- Data exploration
- Best practices

Prepare the dashboard dataset

- Understanding the Dataset for the Dashboard
- Creating the visualizations
- Cumulative representation
- Drilled down representation
- Segmented representation
- Bar/column, histogram/Pareto, line/trend, area, pie/doughnut, scatter/bubble and box-and-whisker charts where supported by the chosen Excel edition.
- Add charts, filters and slicers to the dashboard; fine-tune presentation and review the result.

2. Optional extension — Python and pandas preparation

- Basic Python Overview
- Introduction to Pandas
- Series
- DataFrames
- Missing Data
- Group By with Pandas
- Merging, Joining, and Concatenating DataFrames

- Pandas Common Operations
- Data Input and Output
- Introduction to Visualization in Python
- Matplotlib Basics
- Matplotlib Introduction
- Line Plots
- Scatter Plots
- Seaborn Visualizations
- Pandas Visualization Overview
- Pandas Time Series Visualization

This is a focused introduction for the workbook exercise, not a complete Python or machine-learning course.

3. Optional extension – Workbook connection and integration

- How to connect to an Excel Workbook
- How to read and write single Values
- How to assign a name
- How to write Excel Functions with Python
- Range Shortcuts
- One-dimensional Data Structures
- How to write Values vertically
- Rows and Columns
- How to read two-dimensional Data Structures
- Advanced Reading with expand
- How to write two-dimensional Data Structures
- Range Indexing and Slicing
- Efficiency
- Running Python Scripts with "Run main"
- VBA Macros essentials
- Running Python Scripts with "RunPython"
- Run main vs RunPython

Use a small supplied web-API data example where authorised and available; external services and libraries are not universally accessible from every Excel environment.

4. Optional extension — Charts and user-defined functions

- How to write a Matplotlib Plot into Excel
- How to update the Plot
- How to change Size and Position
- How write a Seaborn Plot into Excel
- How to create Excel Charts with Python
- Preparations and your first UDF
- How to change the Name and Location of the Python Module
- Troubleshooting (UDF)
- UDFs - Behind the Scenes
- More complex UDFs and the @xw.arg Decorator
- How to create Numpy UDFs
- UDFs and Array Formulas
- Native dynamic-array behaviour versus legacy xlwings expansion options; use the supported approach for the installed Excel version.
- pandas UDF conversions and docstrings.
- Review a small Excel front end with local Python processing, including dependency, macro and maintenance considerations.