

Excel 365 - We Program Office Scripts

Course code: GOC3103

The course is intended for developers and data analysts with knowledge of TypeScript who want to automate routine activities and create complex integration solutions in Microsoft Excel. In the course, you will get acquainted in detail with the ExcelScript API object model, learn to manipulate large volumes of data, format cells, manage ranges, and control tables and charts using code. You will master techniques for calling external web services (REST API) directly from scripts and learn to connect your solutions with cloud business processes using the Power Automate tool. This course is primarily intended for users of the Microsoft 365 environment, which natively supports the running of Office Scripts. The current version of Microsoft Excel with access to cloud functions will be installed in the classroom.

What we will teach you

- Office Scripts runtime architecture and orientation in the ExcelScript API object model
- Object manipulation: workbooks, dynamic cell ranges, formatting, automated pivot tables and charts
- Processing large volumes of data, bulk matrix operations and script performance optimization
- Communication with external systems and data integration using REST API calls directly from scripts
- Catching runtime errors, debugging code and validating input and output data
- Using AI assistants to accelerate the design, refactoring and documentation of more complex scripts
- Limits of Office Scripts technology and comparison with the development of full-fledged add-ins (Office.js)

Required entry knowledge

- TypeScript - type checking for JavaScript

Course Outline

Office Scripts Architecture and Working with ExcelScript API

- Running TypeScript in Excel (Web vs. Desktop) and Security Sandbox
- Script Entry Point:
 - main
 - Function and
 - Workbook
 - Context Object
 - Manipulating Sheets, Dynamic Ranges (
 - Range
 -) and Addressing Cells
 - Reading and Writing Values: Working with 2D Arrays (
 - getValues
 - ,
 - setValues
 -) and Formulas
 - Searching, Sorting and Applying Filters Using Code

Advanced Data Structures and Visualizations

- Working with Structured Tables (
 - Table
 - ,
 - TableColumn
 - ,
 - TableRow
 -)
 - Automating PivotTables (
 - PivotTable

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- } and Configuring Fields
- Programmatically Managing Number Formatting, Styles and Conditions (Conditional Formatting)
- Creating and Dynamically Configuring Charts
- Working with Modern Comments {
- Comment
- } and Notes {
- Note
- }

Optimizing Performance and Working with Big Data

- Office Scripts runtime limits: 120 s timeout and data transfer limits
- Batching: minimizing API calls and data processing in memory
- Using TypeScript array methods {
- map
- ,
- filter
- ,
- reduce
- } for fast transformations
- Handling runtime errors {
- try-catch
- }, data validation and defensive approaches
- Diagnostics, working with the console {
- console.log
- } and debugging limits in the Code Editor

Calling external REST APIs and web integration

- Asynchronous model,
- Promise
- and using the native
- fetch()
- function
- Authentication when calling external endpoints (API keys, Bearer tokens) and security aspects
- Parsing, validating and typing responses in JSON format
- Transforming data from external web services (e.g. currency rates, stock market data) and writing to a workbook
- Sending calculated reports and data structures to external webhooks

Python in MS Excel and Advanced Data Analysis

- Code insertion using
- =PY()
- and loading table data via
- xl()
- object
- Data processing and transformation using pandas library (DataFrames, Series)
- Creating analytical visualizations in cells using matplotlib and seaborn libraries
- Security isolation: explaining network blocking of external APIs in Python in Excel and combining with TypeScript

Office.js (Office Add-ins)

- Limit comparison: Office Scripts vs. Office Add-ins vs. Python in Excel
- Add-in architecture: application manifest, sidebar (Taskpane) and
- Excel.run

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- context
- Creating custom table functions (Custom Functions) for formulas in Excel
- Management, sharing on OneDrive/SharePoint and central enterprise distribution of add-ins
- Can I develop locally in VS Code?

Practical scenarios and complex examples from real practice

- Automated import and cleaning of inconsistent data from corporate REST API into a structured table
- Generation of management report: calculation of aggregations, creation of a pivot table and dynamic chart in one click
- Bulk processing of text feedback from customers using direct LLM API calls (sentiment analysis and automatic tagging)
- Advanced predictive analysis and statistical visualization of sales trends using Python (pandas + seaborn)
- Creation of a custom table function in Office.js for verification of IČO / DIČ or live currency conversion directly in the formula
- Sending approved data reports to a corporate webhook (e.g. MS Teams or internal CRM)

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