**From Excel to Excel + Python Course**

**General**

* Will use Colab notes. This way we can create notebooks
* Will store files on Github, so we have the links available

1. **Course Overview**
   1. This is intended as a course to help people understand what Python is, and to be able to carry out analysis in Python.
2. **Intro to Python & a Quick Start**
   1. Objective: This is intended as a standalone section, to explain what Python is and how it can be useful, even if the audience does not plan on using it.
   2. What is Python?
      * Explains what Python is and how it compares to Excel
      * Explain the concept of IDEs in very high-level terms – how, unlike Excel, there is not a “Python app”.
      * Ways to use it include (1) Google Collab, and (2) using Spyder
      * Also applies to R
   3. How do I turn this thing on?
      * A practical description of how to write Python.
   4. A simple example
      * Provide a concrete example of loading data from scratch. Use the Excel test as an example.
      * Re-run the code
   5. How this this useful?
      * It’s a new tool, not replacing Excel but complementing it.
      * Reproducible and reusable
      * Wide range of things that can be done in Python but not Excel. E.g., GIS analysis
      * Integration with AI – Example of a prompt producing the script above. The ROI on learning Python is now
      * When is Excel better?
3. **Basics**
   1. Variables, data types and basic operations
      * String, integer, Boolean, and float
   2. Lists, Tuples, Dictionaries
   3. Exercises
4. **Loading Excel and CSV files**
   1. Introduction to Pandas
   2. Reading Excel and CSV files
   3. Understanding DataFrames
   4. Exploring data
      * .head(), .info(), .describe()
   5. Exporting data
      * to\_csv(), to\_excel()
   6. Exercises
5. **Cleaning and Manipulating Data**
   1. Filtering Data
      * Filtering with .loc and .iloc
      * Filtering with .query()
      * Filtering with Boolean conditions
   2. Sorting Data
   3. Creating New Columns
      * Variable naming conventions
      * Conditional logic
   4. Handling Missing Data
   5. String Operations
   6. Working with Dates
   7. Exercises
6. **Aggregation and Pivoting**
   1. Grouping and Summarizing with .groupby() and .agg()
   2. Pivoting Data
      * Pivoting “Wider”
      * Pivoting “Longer”
   3. Joining Data
   4. Appending / Concatenating Data
   5. Exercises
7. **Loops and Functions**
   1. Writing functions and using `def`
   2. Simple Loops
   3. Exercises
8. **Visualizing Basics**
   1. Plotting with `matplotlib` and `seaborn`
   2. Line, Bar, Scatter and Histogram Plots
   3. Customizing Plots
   4. Interactive Visuals with Plotly
   5. Exercises