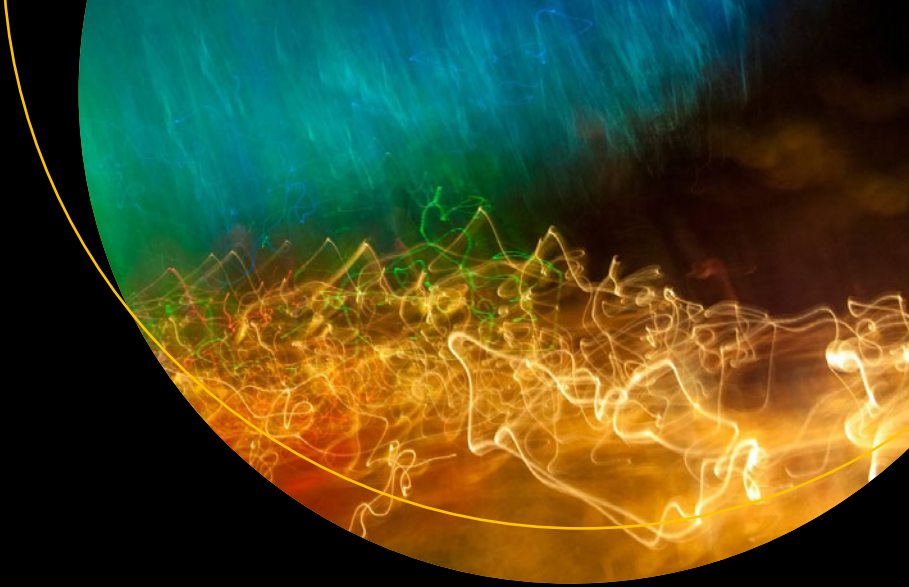




The Ultimate Guide to Functions in Power Query

Turn Raw Data into
Actionable Insights

Omid Motamedisedeh

Apress®

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*To my dear mom and dad, in heartfelt appreciation for
your invaluable support and assistance*

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About the Author



Omid Motamedisedeh is a freelance data and business intelligence analyst with a PhD in Industrial Engineering. He's currently working towards his second PhD at Queensland University of Technology. Omid is the author of several articles in industry journals (*Electric Power Systems Research, Journal of Building Engineering, Energy, Neural Computing and Applications*, and others), and seven books (all

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About the Technical Reviewer

Bo Rydobon (a.k.a. Excel Wizard) is a Microsoft Excel expert and YouTuber from Thailand who is known for his speed and mastery of Excel. He is also the creator of the Excel Wizard YouTube channel, where he shares tips and tricks on how to use advanced dynamic arrays. He actively contributes on [Excelforum.com](https://www.excelforum.com/) and became a Top 5 reputation within a few years. His participation in the Excel BI LinkedIn Excel Challenge drew notable attention due to his impressive response. In 2022, Bo Rydobon won the Excel Esports Speedrun organized by the Financial Modeling World Cup.

Bo Rydobon is an inspiration to Excel users all over the world. He shows that anyone can learn Excel and become an expert, regardless of their background or experience.

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Introduction

In today's data-driven landscape, the ability to seamlessly transform raw data into meaningful insights is a skill of paramount importance. *The Ultimate Guide to Functions in Power Query* stands as a beacon for Excel and Power BI enthusiasts, equipping them with the tools to unlock the full potential of their data manipulation endeavors.

In this comprehensive guide, you will delve into the world of Power Query functions, the building blocks that empower users to effortlessly manipulate, cleanse, and refine their data. Whether you're a seasoned data professional or a novice user, this book is designed to elevate your proficiency in harnessing the capabilities of Power Query functions, ultimately enabling you to convert seemingly complex datasets into actionable insights.

Join me on a journey through the intricacies of Power Query functions as I demystify their functionalities, explore real-world use cases, and provide step-by-step guidance on their application. With a meticulous balance of theory and hands-on practice, *The Ultimate Guide to Functions in Power Query* is not just a book; it's your indispensable companion in mastering the art of data transformation.

Chapters include

1. "Introduction to Power Query:" Build a foundation by learning what Power Query is, its role in data transformation, and the fundamental concepts that underpin its functionality.

INTRODUCTION

2. “Formatting:” Explore the nuances of formatting data, from standardizing text and numbers to customizing visual elements.
3. “Number Functions:” Discover a wealth of functions designed to manipulate and analyze numerical data, from basic arithmetic operations to advanced mathematical calculations.
4. “Text Functions:” Uncover the power of text manipulation with functions that enable you to extract, concatenate, and transform text in various ways.
5. “Date and Time Functions:” Navigate the complexities of date and time data with functions that facilitate calculations, comparisons, and conversions, ensuring accuracy in temporal analysis.
6. “List Functions:” Learn how to work with lists (ordered collections of values) using functions that allow you to manipulate, filter, and transform list-based data structures.
7. “Record Functions:” Dive into the world of records (structures that hold multiple fields of data) and harness functions to modify, extract, and manage record information.
8. “Table Functions:” Master the art of working with tables, the heart of data manipulation in Power Query, using functions that facilitate aggregation, filtering, and transformation.

9. “Extracting from Sources:” Explore how to gather data from various sources (databases, files, and folders) using functions that ensure a smooth extraction process.
10. “Other Functions:” Delve into a collection of miscellaneous functions that offer specialized capabilities, expanding your toolkit for handling unique data manipulation tasks.

Empower yourself with the expertise needed to navigate the challenges of data manipulation and unlock the true potential of your raw data. Whether you're seeking to enhance your analytical capabilities, streamline business processes, or simply gain a competitive edge, this guide is your gateway to turning data into actionable insights.

CHAPTER 1

Introduction to Power Query

In the dynamic landscape of modern data analysis, the ability to turn raw information into meaningful insights is a cornerstone of success. Welcome to the world of Power Query, an invaluable tool that empowers data professionals to tame, reshape, and amplify data, unveiling its hidden potential. This chapter serves as your gateway to understanding the essence of Power Query, its significance, and the journey you are about to embark upon.

In a data-driven era, information is abundant, sprawling across spreadsheets, databases, cloud storage, and beyond. But this information is often disparate, inconsistent, and unstructured. This is where Power Query steps in as a guiding light, enabling you to navigate through these complexities and emerge with knowledge that fuels smarter decision-making.

Your exploration begins with a foundational understanding of what Power Query truly is: a powerful data transformation tool embedded within familiar environments such as Microsoft Excel and Power BI. I'll unveil its intuitive interface, its versatile functions, and its innate ability to streamline even the most intricate data manipulation tasks.

As you delve deeper, you'll grasp the essence of data transformation. Power Query empowers you to shape data to your needs, from cleaning and merging to filtering and aggregating. These transformations form the bedrock of insightful analysis, turning data from a puzzle into a clear picture.

Moreover, Power Query serves as a bridge between disparate data sources. Whether you're dealing with Excel sheets, databases, web APIs, or CSV files, Power Query offers a unified interface to access, transform, and consolidate these sources into cohesive narratives.

So, let's embark on this journey through the world of Power Query. After you navigate through the chapters to come, you'll emerge with the prowess to wield Power Query as a transformative tool, transcending data challenges and unveiling insights that lead to better, more informed decisions.

Introduction to Power Query

Power Query is a powerful tool for refining and cleaning data in Excel and Power BI. It covers the three main tasks of ETL: extract, clean, and load tables. These tasks involve

- Extracting data from various databases including SQL, Access, Microsoft Azure, and other sources like websites, Excel files, text files, and more
- Cleaning data by removing extra columns, changing value formats, adding new columns, combining tables, and so on
- Loading data (in Excel, Power Pivot, or Power BI)

This tool was introduced as an add-in for Excel 2010 and later for 2013. In these versions, by installing the add-in, a new tab called Power Query was added to Excel, as shown in Figures [1-1](#) and [1-2](#).

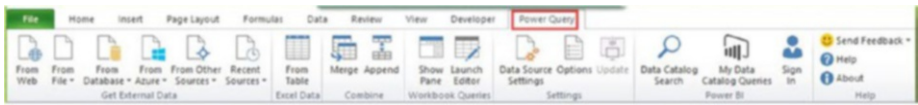


Figure 1-1. Power Query tab in Excel 2010

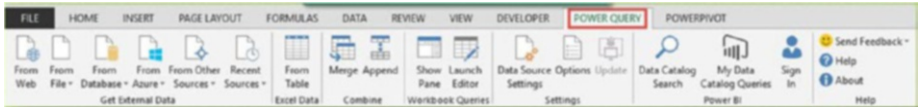


Figure 1-2. Power Query tab in Excel 2013

In Excel 2016 and later, this tool was added to the main Excel commands in the Data tab. In Excel 2021 and also 365, the commands related to Power Query are available in the Get & Transform Data group under the Data tab, and users can perform data extraction, modification, and loading processes using these commands (Figure 1-3).

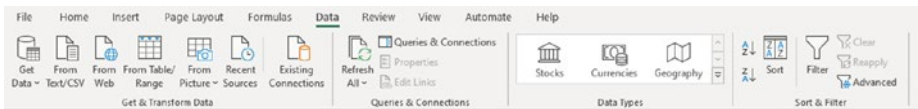


Figure 1-3. Power Query in Excel 365

In Power BI, the commands related to Power Query are located in the Data section of the Home tab, as shown in Figure 1-4.

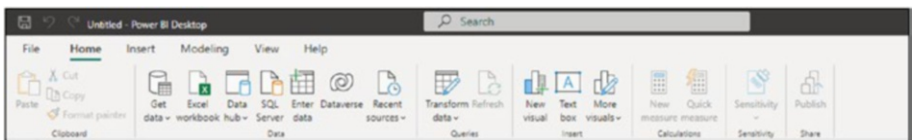


Figure 1-4. Power Query in Power BI

Power Query in Excel

In Excel, to extract values from various sources such as other Excel files, simply select the Get Data command in the Get and Transform Data section of the Data tab (Figure 1-5).

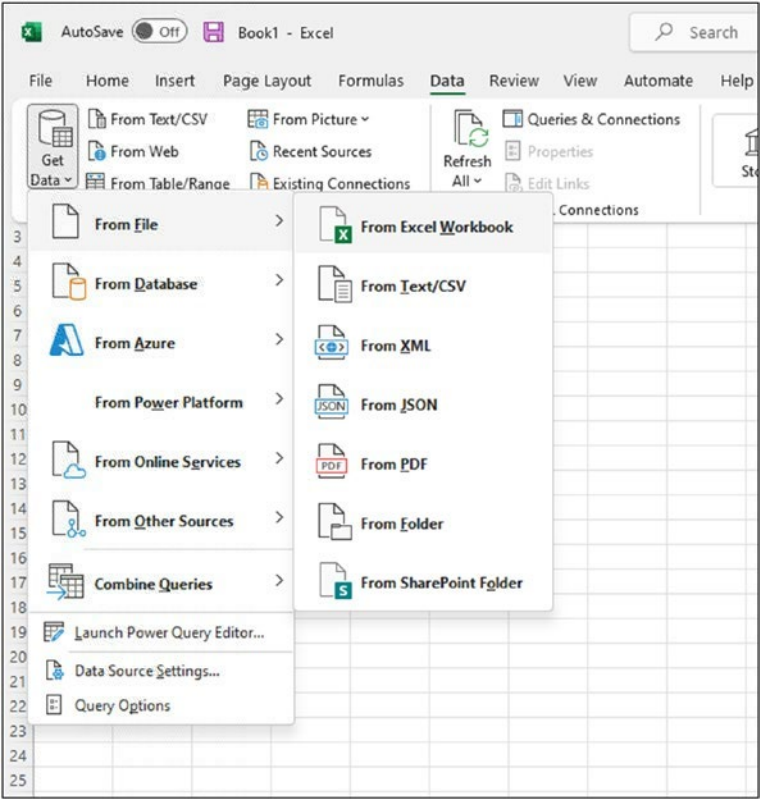


Figure 1-5. *Extracting data from an Excel file*

As you can see in Figure 1-5, different options are provided to extract the tables from different data sources. To extract values from another Excel file, select From File, and then From Excel File. The window shown in Figure 1-6 will appear and you can navigate the desired Excel file.

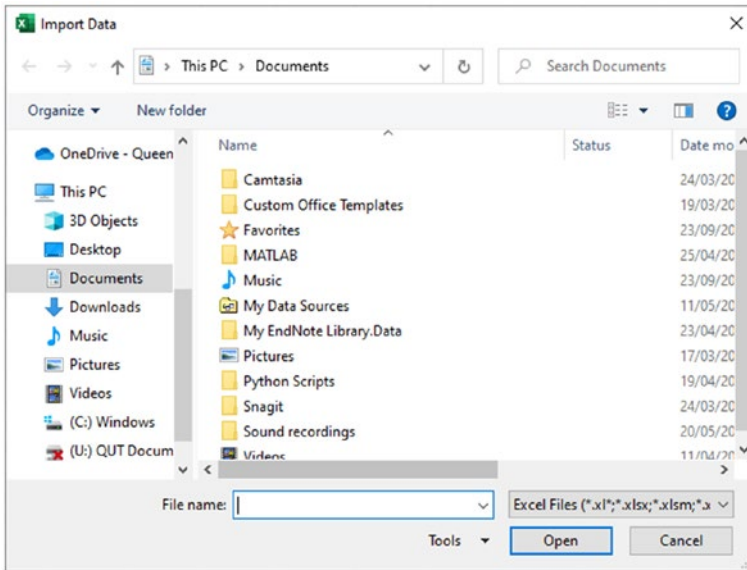


Figure 1-6. Addressing the Excel file

By addressing the desired Excel file (in this example, 06-Inventory.xlsx) and clicking Open, a new window will open, as shown in Figure 1-7.

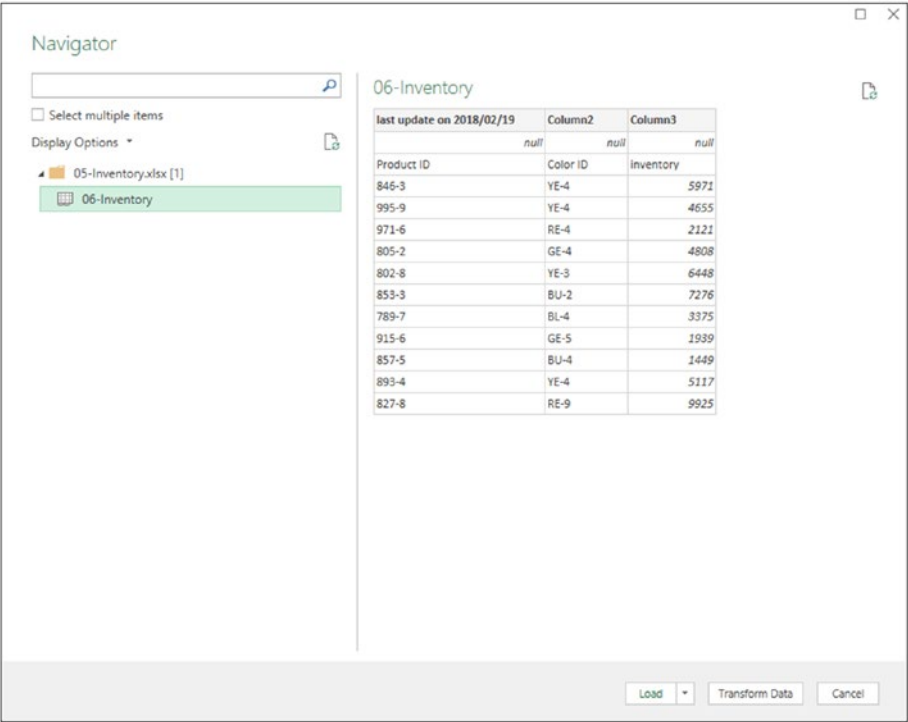


Figure 1-7. Table selection window

You'll see a list of all tables and sheets in the selected Excel file on the left side of this window. Depending on the user's needs, one or more tables can be selected and called in Power Query for the cleaning process. In this example, by selecting the 05-Inventory table and selecting the Transform button, the data is loaded in Power Query, as shown in Figure 1-8. (Now the data extraction process is completed.)

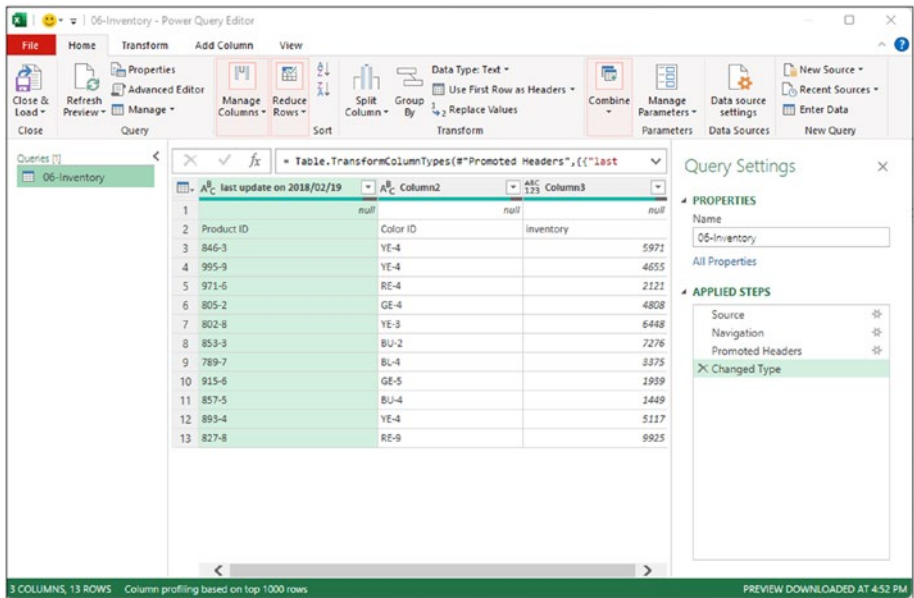


Figure 1-8. Data extraction in Power Query

Now you can perform the cleaning process via various commands. For example, to remove the first row of the table (empty row), simply select the Remove Top Rows command from the Reduce Rows section of the Home tab. The window shown in Figure 1-9 will appear to determine the number of rows that you want to remove from the top of the table.

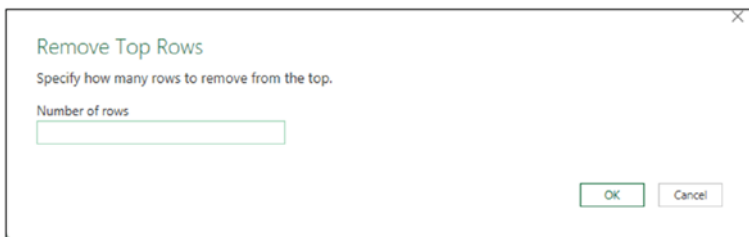


Figure 1-9. Selecting the number of rows to remove

CHAPTER 1 INTRODUCTION TO POWER QUERY

Enter 1 in the field and confirm it. As you can see in Figure 1-10, the first row of the table gets removed.

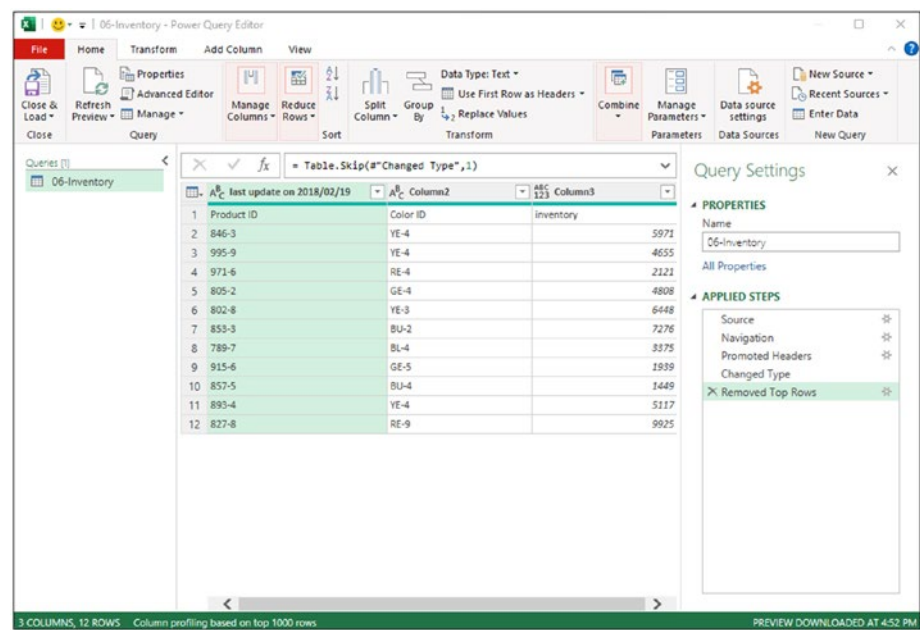


Figure 1-10. Removing the first data row

In the next step, to replace the column headers with the first row, select the Use first row as header command from the Transform tab. See Figure 1-11 for the result.

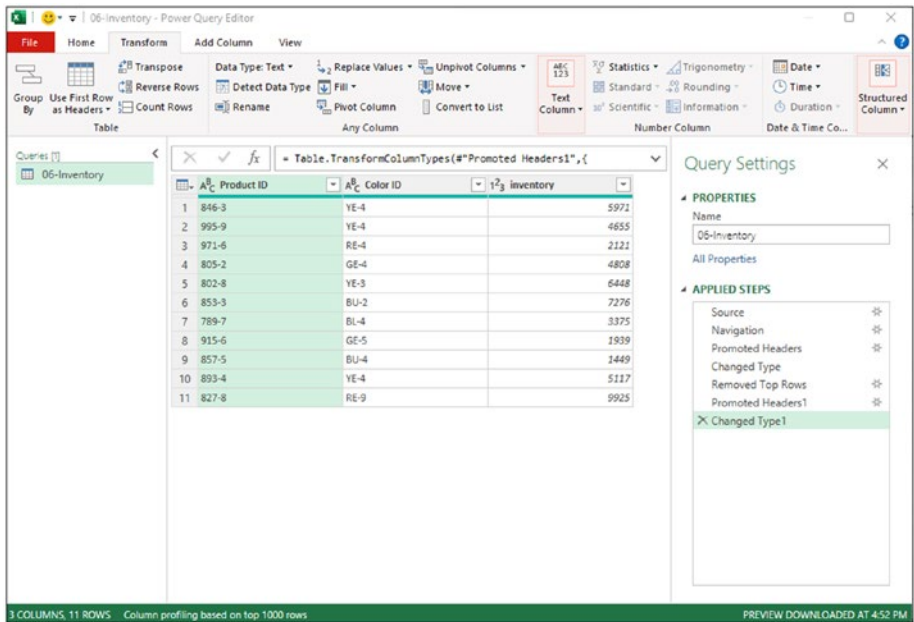


Figure 1-11. Replacing column headers with the first data row

The Product ID Column in the table shown in Figure 1-11 consists of two parts, the main part (before the dash) and a subpart (after the dash). Say you want to separate these two parts. Select the Product ID column and choose the Split By delimiter command from the Split Column section of the Home tab. See the results in Figure 1-12.