**Objective 1**

**Connect and profile the data**

Your first objective is to connect to the source data files, conduct basic profiling and QA tasks, and familiarize yourself with the tables and fields you'll be working with.

**Task**

1. Connect to the **sales**, **products**, **stores**, and **calendar** csv files

**Task 1 Hint:**

Use the New Source > Text/CSV option from the Query Editor in Power BI or Excel

1. Review table columns, check for blank or null values, confirm that datatypes are accurately defined, and identify any primary and foreign keys

**Task 2 Hint:**

You can confirm data types by checking the icons in each column header, and hover over the green bar under the headers to quickly check for errors or empty values

1. Take a moment to profile the data. How many transactions were recorded? How many stores does Maven Toys operate? What are the lowest and highest priced products?

**Task 3 Hint:**

Use Power Query's column quality and column profile tools to plot distributions, count distinct and unique values, view column statistics, and check for errors or empty values.

1. Add calculated columns in the **calendar** table for ‘start of month’ and ‘start of week’

**Task 4 Hint:**

Use the Date tools in the Add Column menu (vs. Transform) to create new fields, rather than overwriting existing ones

**Objective 2**

**Create a relational model**

Your second objective is to create a relational data model by defining relationships between fact and dimension tables, creating simple hierarchies, and adjusting model properties.

**Task**

1. Load the tables to the data model and create relationships from the **sales** table to the **products**, **stores**, and **calendar** tables

**Task 1 Hint:**

Use the Manage Relationships dialog box or "draw" relationships in the Model view by connecting the primary and foreign keys of each table

1. Confirm that you are following data modeling best practices. Your model should take the form of a star schema, with 1:many relationships between fact and dimension tables

**Task 2 Hint:**

If you don't see 1-to-many relationships in your model, check the data to confirm that you don't have duplicate values in your primary key fields

1. Create a date hierarchy containing the ‘start of month’, ‘start of week’, and ‘date’ fields

**Task 3 Hint:**

Right click the 'Start of Month' field to create a new hierarchy, and add the 'Start of Week' and 'Date' fields by right-clicking them in the Data pane or manually selecting them in the Properties pane

1. Hide all foreign keys in the **sales** table from the report view

**Task 4 Hint:**

You can hide fields by right-clicking them in the Model view or toggling the "Is Hidden" option in the Properties pane

**Objective 3**

**Add calculated measures & fields**

Your third objective is to enhance the data model and prepare for analysis by defining new measures and calculated fields.

**Task**

1. Create calculated columns in the **sales** table to pull in ‘cost’ and ‘price’ from the **products** table, then use those fields to calculate revenue and profit for each transaction

**Task 1 Hint:**

The RELATED function will be helpful here

1. Create measures to calculate the count of orders (‘total orders’), sum of revenue (‘total revenue’) and sum of profit (‘total profit’)

**Task 2 Hint:**

You can use DISTINCTCOUNT or COUNTROWS functions to calculate total orders, and a SUM function to calculate total revenue and profit

1. **BONUS**: Define new measures to calculate total revenue and profit without referencing the calculated columns in the **sales** table

**Task 3 Hint:**

An iterator function like SUMX allows you to multiply the units sold by the RELATED product price for each transaction and sum the results

**Objective 4**

**Build an interactive report**

Your final objective is to visualize the data and create an interactive report to show orders, revenue and profit over time and by product category.

**Task**

1. Add KPI card visuals showing ‘total orders’, ‘total revenue’ and ‘total profit’ for the current month, along with monthly trends for each metric

**Task 1 Hint:**

If you are using KPI Cards in Power BI, add 'Start of Month' to the trend axis to show a monthly trend and display the value for the latest month

1. Add a slicer to filter the report page by store location

**Task 2 Hint:**

If your visuals don't update when you change slicer selections, confirm that you have an active relationship between the **sales** and **stores** tables in your Model view

1. Add a bar chart showing ‘total orders’ by product category, and a line chart showing ‘total revenue’ with the date hierarchy on the x-axis

**Task 3 Hint:**

Add new Power BI charts from the Home or Insert menus, or by dragging a field onto the canvas

1. Assemble the charts into a logical layout and adjust formatting, alignment and polish to finalize the report as you see fit

**Task 4 Hint:**

Update chart titles for readability, adjust display units to round values appropriately, eliminate unnecessary chart elements, and update colors as you see fit

**Final Step**

**Final Project Question**

Answer the following question to validate your completed project.

What was the total revenue for Arts & Crafts products in February 2023?

Ans: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_