**Day 4: Data Modelling Basics**

**🔰 Topics Covered:**

* Introduction to relationships
* Schema design
* Data types and calculated columns

**🟢 1. Introduction to Relationships**

**🔹 What is a Relationship?**

A **relationship** is a link between two tables based on a common column. It helps Power BI understand how data is connected.

**🔹 Types of Relationships:**

|  |  |
| --- | --- |
| **Relationship Type** | **Description** |
| **One-to-Many** | One record in a table connects to many in another (most common) |
| **One-to-One** | One record links to exactly one in another |
| **Many-to-Many** | Many records in one table relate to many in another |

**🔹 How to Create a Relationship:**

1. Go to **Model View** (left-side icon with 3 tables).
2. Drag the column from one table and drop it onto the matching column in another.
3. Or go to **Manage Relationships > New**, then define manually.

✅ **Example:** Link a Sales table to a Products table using the Product ID.

**🟢 2. Schema Design**

**🔹 What is Schema Design?**

Schema design defines **how tables are structured and connected**. It impacts performance, ease of use, and accuracy of reports.

**🔹 Star Schema vs Snowflake Schema**

|  |  |  |
| --- | --- | --- |
| **Feature** | **Star Schema** | **Snowflake Schema** |
| Structure | Central fact table with direct dimension links | Dimensions are normalized into sub-tables |
| Performance | Faster, simpler to understand | Slower, more complex |
| Recommended? | ✅ Yes (for most Power BI projects) | ❌ Use only if needed for normalization |

💡 **Fact Table** = transactional data (e.g., Sales)  
💡 **Dimension Tables** = descriptive data (e.g., Products, Customers)

**🟢 3. Data Types and Calculated Columns**

**🔹 Data Types in Power BI:**

Each column has a specific data type. Common types:

* **Text**
* **Whole Number**
* **Decimal Number**
* **Date/Time**
* **Boolean (True/False)**

⚠️ Correct data types are important for accurate calculations and visuals.

**🔹 How to Change Data Types:**

1. In **Data View**, select a column.
2. From the top ribbon, choose **Data Type**.
3. Choose the correct type (e.g., Text, Number, Date).

**🔹 Calculated Columns**

These are custom columns created using **DAX (Data Analysis Expressions)**.