Data (Sales Table):

OrderID	Product	Price	Quantity
101	Laptop	800	2
102	Phone	500	1
103	Tablet	300	3

1. Calculated Columns (Row-Level)

1.1 Total Price (Price × Quantity)

- **Formula:**

```
Total Price = Sales[Price] * Sales[Quantity]
```

- **Purpose:**
  Calculates the total cost of each item sold.
- **Visualization:**
- **Table or Matrix:** Show `OrderID`, `Product`, `Total Price`.
- **Bar Chart:** Sum of `Total Price` by `Product`.

1.2 Discounted Price (10% Off)

- **Formula:**

```
Discounted Price = Sales[Total Price] * 0.9
```

- **Purpose:**
  Applies a fixed discount across all sales.
- **Visualization:**
- **Clustered Bar Chart:** Compare `Total Price` vs. `Discounted Price` by `Product`.

1.3 Profit Margin (20% Profit on Sales)

- **Formula:**

```
Profit Margin = Sales[Total Price] * 0.2
```

- **Purpose:**
  Shows the profit earned on each sale.
- **Visualization:**
- **Column Chart:** Show profit by `Product`.

---

2. Measures (Aggregated/Filtered Calculations)

2.1 Total Sales

- **Formula:**

```
Total Sales = SUM(Sales[Total Price])
```

- **Purpose:**
  Calculates the overall revenue from all sales.
- **Visualization:**
- **Card Visual:** Display `Total Sales`.
- **Bar Chart:** Sum of `Total Price` by `Product`.

2.2 Average Price Per Product

- **Formula:**

```
Average Price = AVERAGE(Sales[Price])
```

- **Purpose:**
  Shows the average price of products sold.
- **Visualization:**
- **Column Chart:** Show average price by `Product`.

2.3 Total Quantity Sold

- **Formula:**

```
Total Quantity Sold = SUM(Sales[Quantity])
```

- **Purpose:**
  Displays the total number of products sold.
- **Visualization:**
- **Clustered Column Chart:** Quantity sold by `Product`.
- **Pie Chart:** Distribution of quantity sold by `Product`.

2.4 Count of Orders

- **Formula:**

```
Order Count = COUNTROWS(Sales)
```

- **Purpose:**
  Counts the total number of orders processed.
- **Visualization:**
- **KPI or Card Visual:** Show total orders.

2.5 Percentage of Sales by Product

- **Formula:**

```
Sales Percentage =
    DIVIDE(
        SUM(Sales[Total Price]),
        CALCULATE(SUM(Sales[Total Price]), ALL(Sales))
    )
```

- **Purpose:**
  Calculates what percentage of total sales comes from each product.
- **Visualization:**
- **Donut Chart:** Show the sales distribution by `Product`.

2.6 Highest Sales (Top Product)

- **Formula:**

```
Top Sale = MAX(Sales[Total Price])
```

- **Purpose:**
  Displays the highest individual sale value.
- **Visualization:**
- **Card Visual:** Highlight the highest sale.

---

3. Time-Based Calculations (Requires Date Field)

If you later add a `Date` column to the data, you can create the following:

3.1 Sales Year-Over-Year (YOY) Growth

```
YOY Growth =
    CALCULATE(
        SUM(Sales[Total Price]),
        SAMEPERIODLASTYEAR(Sales[OrderDate])
    )
```

- **Visualization:**
- **Line Chart:** Compare sales across years.

3.2 Running Total (Cumulative Sales)

```
Running Total =
    CALCULATE(
```

```
        SUM(Sales[Total Price]),
        FILTER(
            ALL(Sales[OrderDate]),
            Sales[OrderDate] <= MAX(Sales[OrderDate])
        )
    )
```

- **Visualization:**
- **Line Chart:** Shows cumulative sales over time.

---

4. Visualization Examples (Multiple Charts)

4.1 Product Performance

- **Chart:** Stacked Column Chart
- **X-Axis:** `Product`
- **Values:**
  - `Total Price`
  - `Profit Margin`
- **Legend:** `Discount Applied`

Goal: Compare the performance of each product across revenue and profit.

4.2 Sales by Product (Top 5 Products)

- **Chart:** Clustered Bar Chart
- **Axis:** `Product`
- **Value:** `Total Sales`
- **Filter:** Show **Top 5 Products** by sales.

Goal: Highlight best-selling products.

4.3 Sales Distribution by Quantity

- **Chart:** Tree Map
- **Group:** `Product`

- **Value:** `Total Quantity Sold`

Goal: Show the distribution of products by quantity sold.

---

5. Practice Exercises for Students

1. **Calculate a 15% tax** on each sale using a **calculated column**.
2. **Create a measure** that shows **total sales by each product category**.
3. **Build a KPI visual** to track **total revenue** with a goal of `$5000`.
4. **Use a slicer** to filter sales by `Product`.
5. **Calculate average profit per product** and visualize it using a **bar chart**.