VISUALIZING US NATURAL DISASTER DECLARATION – TRENDS AND PATTERNS

Week 6 Documentation

DAX: Data Analysis Expressions in Power BI

DAX: Data Analysis Expressions in Power BI

1. Introduction

Week 6 focused on Data Analysis Expressions (DAX), the formula language that powers calculations in Power BI. DAX is considered the *brain of Power BI* because it enables the creation of measures, calculated logic, and advanced expressions that drive meaningful insights. The emphasis this week was on understanding measures, differentiating implicit and explicit calculations, applying filters with CALCULATE, and using conditional logic to answer analytical questions.

2. DAX Fundamentals

2.1 Icons and Entry Points

- **Grid icon:** Represents tables.

- **Sigma icon:** Represents numeric values (aggregations).

- **Calculator icon:** Represents measures.

Create New Measure: Right-click on a column → *New Measure*.

Examples:

- **totalProfits = SUM(TableName[ColumnName])**

- **totalProfits = AVERAGE(TableName[ColumnName])**

Note: Measures are not stored in the table view but can be visualized in the canvas.

2.2 Importance of Relationships

- Ensure tables are connected before applying measures.

- Without relationships, measures may return incomplete or incorrect results.

- Reinforced the importance of a connected data model for accurate DAX calculations.

2.3 Implicit vs. Explicit Measures

- **Implicit Functions:** Auto-generated by Power BI (e.g., SUM, AVERAGE).

- **Explicit Measures:** Created manually using DAX.

2.4 Types of Measures:

- **Base Measures:** Simple reusable measures.

- **Composite Measures:** Built from base measures.

Note: Explicit measures provide more control, reusability, and clarity compared to implicit ones.

3. Advanced DAX Functions

3.1 CALCULATE Function

- Most widely used DAX function, applies filters to expressions.

    Syntax:

    CALCULATE(Expression, Filter1, Filter2...)

    Example:

    CALCULATE([total profit], DimEmployee[Role] = "Manager")

Note: Slicers can override all DAX functions except CALCULATE().

3.2 Conditional Logic

- Use **IF** statements for decision-based measures.

    Example:

    measure = IF([total profit] > 500000, "Passed", "Failed")

- Conditional measures allow categorization and threshold-based analysis.

4. Best Practices

- Always frame measures around a clear analytical question.

- Avoid relying on implicit functions; prefer explicit measures for clarity.

- Use DAX even for simple calculations to ensure reusability and control.

- Remember Measures are scalar values and cannot be combined directly with columns.

5. Outcome of Week 6

By the end of Week 6:

- Understood the role of DAX in Power BI.

- Learned to create base and composite measures for reusability.

- Applied CALCULATE for filtered expressions.

- Implemented conditional logic for threshold-based insights.

6. Next Steps (Week 7 Preview)

In Week 7, the focus will shift to charts and dashboard creation, including:

- Designing effective visualizations in Power BI.

- Building interactive dashboards with slicers and filters.