

# Week 6 Report

## Topic: DAX Operations in Power BI

### Introduction

DAX (Data Analysis Expressions) is the formula language in Power BI that enables dynamic calculations. It allows you to create **measures**, **calculated columns**, and **tables**, which update automatically based on filters, slicers, and relationships. DAX is essential for building complex analytics and interactive dashboards.

### Measures and Calculated Columns

- **Measure:** A dynamic calculation that is not stored in the table but evaluated in visuals.
- Example: Total Profit = SUM(FactSales[Profit])
- **Calculated Column:** Adds a new column to a table using DAX. Values are stored row by row.
- Measures can be reused across multiple visuals, while calculated columns are table-specific.

### Implicit vs Explicit Calculations

- **Implicit Functions:** Default Power BI functions like SUM, AVERAGE, COUNT, MAX, etc.
- **Explicit Functions:** Custom calculations written manually in DAX. Offers flexibility, reusability, and the ability to handle complex scenarios.
- Example: Total Revenue = [Total Profit] + [Total Cost]

### Base and Composite Measures

- **Base Measure:** Created directly from a column using simple operations.
- Example: Total Profit = SUM(FactSales[Profit])
- **Composite Measure:** Created using existing measures for further calculations.
- Example: Total Revenue = [Total Profit] + [Total Cost]

### Key DAX Function: CALCULATE

- **Purpose:** Applies filters to an expression dynamically.
- **Syntax:** `CALCULATE(Expression, [Filter1], [Filter2], ...)`
- **Example:**

```
ProfitFromManagers = CALCULATE([Total Profit], DimEmployee[Role] = "Manager")
```

- Slicers can override visual filters but do not override CALCULATE filters.

### Best Practices

- Frame a question before creating a measure.
- Prefer explicit measures for complex models.

- Reuse measures across visuals for consistency.
- Convert columns to base measures before combining with other measures.

## **Conclusion**

DAX is the backbone of advanced calculations in Power BI. Understanding measures, calculated columns, explicit functions, base vs composite measures, and the CALCULATE function is crucial for building interactive and accurate dashboards. Proper use of DAX ensures flexibility, reusability, and precise control over data analysis.