✅ Lesson 14: DAX Optimization (Chocolate Sales.csv)

📌 Prerequisite Steps:

1. Disable Auto Date/Time:
   File > Options > Current File > Data Load > Uncheck "Auto Date/Time"
2. Create Date Table:

DAX

КопироватьРедактировать

```
DateTable =
ADDCOLUMNS (
    CALENDARAUTO(),
    "Year", YEAR([Date]),
    "Month", FORMAT([Date], "MMMM"),
    "MonthNo", MONTH([Date]),
    "YearMonth", FORMAT([Date], "YYYY-MM")
)
```

Ensure relationship between DateTable[Date] and ChocolateSales[OrderDate]

💡 DAX Measures with VAR:

1. % Growth in Sales Compared to Last Year

DAX

КопироватьРедактировать

```
Sales YoY Growth % =
VAR CurrentSales = SUM(ChocolateSales[SalesAmount])
VAR PrevYearSales = CALCULATE(SUM(ChocolateSales[SalesAmount]),
SAMEPERIODLASTYEAR(DateTable[Date]))
```

RETURN

IF(ISBLANK(PrevYearSales), BLANK(), DIVIDE(CurrentSales - PrevYearSales, PrevYearSales))

---

2. Sales Difference Between Current Month and Previous Month

DAX

КопироватьРедактировать

Sales MoM Diff =

VAR CurrentSales = SUM(ChocolateSales[SalesAmount])

VAR PrevMonthSales = CALCULATE(SUM(ChocolateSales[SalesAmount]), PREVIOUSMONTH(DateTable[Date]))

RETURN

CurrentSales - PrevMonthSales

---

3. Total and Average Monthly Boxes in One Measure

DAX

КопироватьРедактировать

Total_And_Avg_Boxes =

VAR TotalBoxes = SUM(ChocolateSales[Boxes])

VAR MonthCount = DISTINCTCOUNT(DateTable[YearMonth])

VAR AvgBoxes = DIVIDE(TotalBoxes, MonthCount)

RETURN

"Total: " & TotalBoxes & " | Avg: " & FORMAT(AvgBoxes, "0.00")

---

4. Return Only Average Monthly Boxes

DAX

КопироватьРедактировать

```
Avg_Monthly_Boxes =
VAR TotalBoxes = SUM(ChocolateSales[Boxes])
VAR MonthCount = DISTINCTCOUNT(DateTable[YearMonth])
RETURN
DIVIDE(TotalBoxes, MonthCount)
```

---

5. Growth % from Last Month

DAX

КопироватьРедактировать

```
Growth MoM % =
VAR Current = SUM(ChocolateSales[SalesAmount])
VAR Prev = CALCULATE(SUM(ChocolateSales[SalesAmount]),
PREVIOUSMONTH(DateTable[Date]))
RETURN
IF(ISBLANK(Prev), BLANK(), DIVIDE(Current - Prev, Prev))
```

---

6. 3-Month Moving Average

DAX

КопироватьРедактировать

```
Sales Moving Avg 3M =
AVERAGEX(
    DATESINPERIOD(DateTable[Date], MAX(DateTable[Date]), -3, MONTH),
    CALCULATE(SUM(ChocolateSales[SalesAmount]))
```

)

---

7. Dynamic Message Based on Sales Rank and YoY

DAX

КопироватьРедактировать

```
Performance Message =
VAR Chocolate = SELECTEDVALUE(ChocolateSales[Product])
VAR SalesRank = RANKX(ALL(ChocolateSales[Product]), [Total Sales])
VAR SalesYoY = [Sales YoY Growth %]
RETURN
SWITCH(
    TRUE(),
    SalesRank <= 3 && SalesYoY > 0, "Top Performer - Sales up by " &
FORMAT(SalesYoY, "0%"),
    SalesRank <= 5, "Consistent Performer",
    "Needs Improvement"
)
```

---

8. Top 5 DAX Optimization Tips

- Use VAR to avoid recalculating expressions
- Avoid using ALL() unnecessarily (may slow performance)
- Replace IF with SWITCH for multiple conditions
- Minimize use of CALCULATE inside iteration functions
- Reduce cardinality by formatting data (avoid long text columns)

---

9. Tools Benefits

Tool	Purpose
DAX Studio	Query performance analysis, query plan
Performance Analyzer	Visual-wise load time & bottlenecks
Tabular Editor	Create calculated columns/measures faster, best practices enforcement

---

10. Top 5 Product Flag (Yes/No)

DAX

КопироватьРедактировать

```
Top5 Product Flag =
VAR RankSales = RANKX(ALL(ChocolateSales[Product]), [Total Sales])
RETURN IF(RankSales <= 5, "Yes", "No")
```

✅ Lesson 15: Movies Analysis Dashboard (Movies.xlsx)

📌 Prerequisites:

1. Load Movies.xlsx into Power BI.
2. Replace null values in Budget and BoxOffice with 0 or Median:
    - Use Power Query: = Table.ReplaceValue(...) or Transform > Replace Values
3. Format columns: Ensure Date/Numbers/Text are correct.
4. Create DATE Table based on Release Date:

DAX

КопироватьРедактировать

```
DateTable =
```

```
VAR MinDate = MIN(Movies[Release Date])
VAR MaxDate = MAX(Movies[Release Date])
RETURN
ADDCOLUMNS (
    FILTER (
        CALENDARAUTO(),
        [Date] >= MinDate && [Date] <= MaxDate
    ),
    "Year", YEAR([Date]),
    "Month", FORMAT([Date], "MMMM"),
    "YearMonth", FORMAT([Date], "YYYY-MM")
)
```

💡 DAX Calculated Columns and Measures:

1. Profit Column

DAX

КопироватьРедактировать

```
Profit = Movies[Box Office] - Movies[Budget]
```

---

2. Run Time Category Column

DAX

КопироватьРедактировать

```
RunTime Category =
SWITCH(TRUE(),
```

```
    Movies[Run Time] < 90, "Short",
    Movies[Run Time] >= 90 && Movies[Run Time] < 120, "Medium",
    Movies[Run Time] >= 120, "Long",
    "Unknown"
)
```

---

3. Total Box Office

DAX

КопироватьРедактировать

```
Total Box Office = SUM(Movies[Box Office])
```

4. Average Budget

DAX

КопироватьРедактировать

```
Average Budget = AVERAGE(Movies[Budget])
```

5. Average Margin

DAX

КопироватьРедактировать

```
Average Margin = AVERAGE(Movies[Profit])
```

6. Total Movies with Oscars

DAX

КопироватьРедактировать

```
Movies with Oscars = CALCULATE(COUNTROWS(Movies), Movies[Oscar Wins] > 0)
```

7. Top Genre by Box Office

DAX

КопироватьРедактировать

```
Top Genre =
CALCULATE(
    MAXX(
        VALUES(Movies[Genre]),
        CALCULATE(SUM(Movies[Box Office]))
    )
)
```

8. Year-over-Year Box Office Growth

DAX

КопироватьРедактировать

```
YoY Growth =
VAR Current = SUM(Movies[Box Office])
VAR LastYear = CALCULATE(SUM(Movies[Box Office]),
SAMEPERIODLASTYEAR(DateTable[Date]))
RETURN DIVIDE(Current - LastYear, LastYear)
```

9. Avg Nominations per Director

DAX

КопироватьРедактировать

```
Avg Nominations/Director =
AVERAGEX(
    VALUES(Movies[Director]),
    CALCULATE(SUM(Movies[Nominations]))
)
```

📊 Dashboard Visual Suggestions

Page 1: Overview

- Card: Total Box Office, Profit Margin, Movies with Oscars
- Stacked Bar Chart: Box Office by Genre (by Certificate)
- Line Chart: Box Office by Release Year
- Slicer: Country, Release Date
- KPI: YoY Box Office Growth

Page 2: Director Analysis

- Treemap: Budget by Director (Color: Oscar Wins)
- Table: Directors, Total Nominations, Total Oscars, Avg Nominations
- Donut Chart: Run Time Category per Director
- Slicer: Genre

Page 3: Genre and Country Insights

- Matrix: Genre vs Country → Total Box Office
- Pie Chart: Box Office Share by Certificate
- Word Cloud: Genre (custom visual)
- Slicer: Run Time Category
- Matrix Conditional Formatting: Color Scale for Box Office