# Using DAX to Enhance a Power BI Model



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**Preparing Data** 

Modeling

Load

Relationships

**Transform** 

Reporting

**Basic Calculations** 

Time Intelligence

**Evaluation Context** 

#### Overview



- Introducing DAX
- Defining new columns
  - Concatenating columns
  - Translating a value
  - Performing a lookup to a related table
- Creating measures
- Using DAX in parameters

# DAX

Data Analysis Expressions is a language for defining columns and measures in Power BI data models.



# Comparing Excel and DAX Functions

4	А	В	С	D	Е	F	G
1		1/1/2008	2/1/2008	3/1/2008	4/1/2008	5/1/2008	6/1/2008
2	Mountain-200 Black, 38	\$66,095.71	\$122,552.47	\$145,163.63	\$85,880.36	\$154,131.53	\$166,616.27
3	Road-250 Black, 44	\$58,640.40	\$83,562.57	\$76,232.52	\$63,038.43	\$79,164.54	\$57,174.39
4	Touring-1000 Blue, 46	\$60,078.56	\$90,117.85	\$92,978.73	\$67,832.51	\$81,535.19	\$134,461.55
5							
6							
7				=B2			

IMDB ID 🔻	Budget 💌	Popularity 💌	Release Date	Runtime 🔻	Awards 🔻	Nominations	Ŧ
tt0464029	0	0.6	03/01/2006	90			
tt0108148	0	8.7	09/03/1993	90			
tt0115665	0	3.0	09/20/1996	90			
tt0102293	0	4.3	10/05/1991	90			
tt0341495	0	1.7	11/15/2002	90			
tt0122029	0	0.5	12/31/1979	90			
tt0414931	0	3.1	06/10/2004	90			

#### Excel

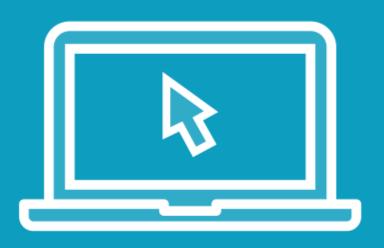
=B2 + C2

=SUM(B2:B4)

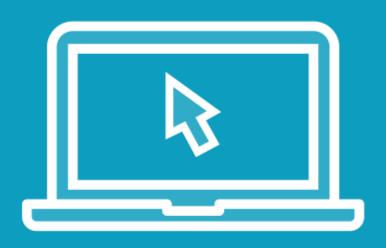
#### DAX

=COUNTROWS('Movie Values')

=AVERAGE('Movie Values'[Runtime])



Create a Full Name column by concatenating First Name and Last Name



Translate raw values in Year Born and Year Died columns into a new Age column





Add variables to a DAX expression





Perform a lookup to related tables to add Age at Filming column to Movie Principals



```
Movie Count =
COUNTROWS(Movies)
```

```
Total Budget =
SUM('Movie Values'[Budget])
```

```
Total Revenue =
SUM('Movie Revenue'[Revenue])
```

■ Count all the rows in a table

■ Sum all the values in the Budget column

■ Sum all the values in the Revenue column



```
Gross Profit =
[Total Revenue] - [Total Budget]

Gross Profit % =
IF(
ISBLANK([Total Revenue]),
BLANK(),
[Gross Profit]/[Total Revenue])
```

■ Subtract total revenue from budget

◆ Divide gross profit by revenue only if revenue is not blank

### Measures vs. Calculated Columns

#### Measures

Calculated on addition to visualization

Table name not required in expression

Name must be unique within model

No impact on memory

#### **Calculated Columns**

Calculated on addition to model

Table name might be required

Name must be unique within table

Increases memory used by model



#### Add measures to the data model:

- Total Budget
- Total Revenue
- Gross Profit
- Gross Profit %



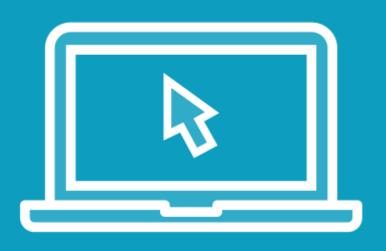
# Using DAX in Parameters



#### **Query Parameter**

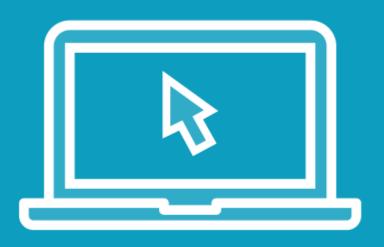
Pass a user selection to a query and reference the selection in a DAX expression





Add query parameters for Earliest Year and Latest Year as filters for the Movies table





Create a DAX expression referencing query parameters

# Using DAX in Parameters



#### **What If Parameter**

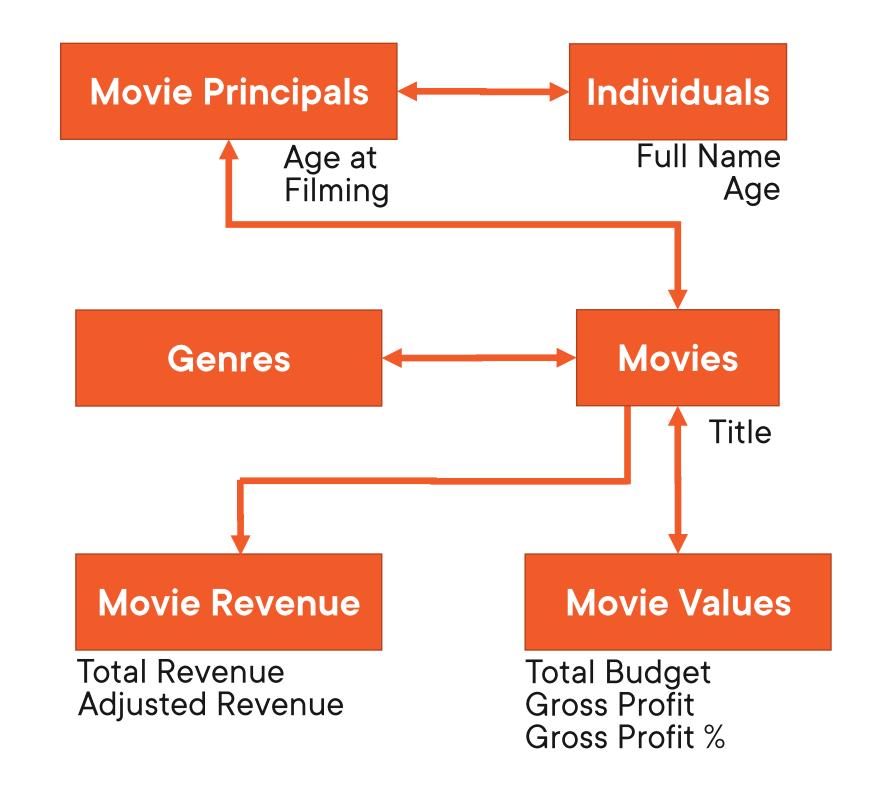
Reference a user selection in a DAX expression to dynamically update a visualization

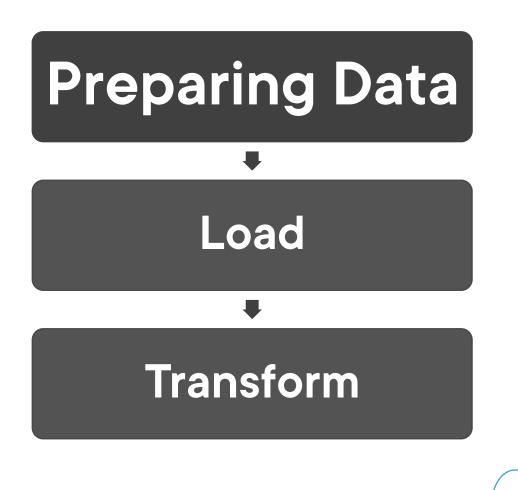


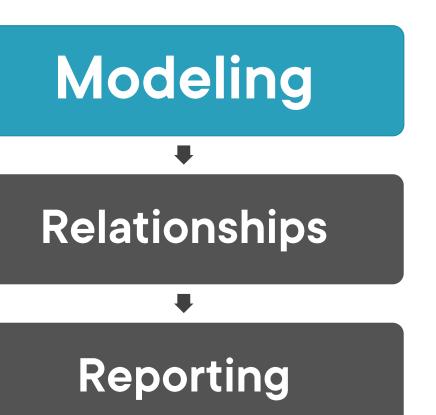


Create a What If parameter to calculate an adjusted revenue amount

Calculated columns
Simple measures
Query parameters
Adjusted Revenue
But...
Date table missing
Date measures missing

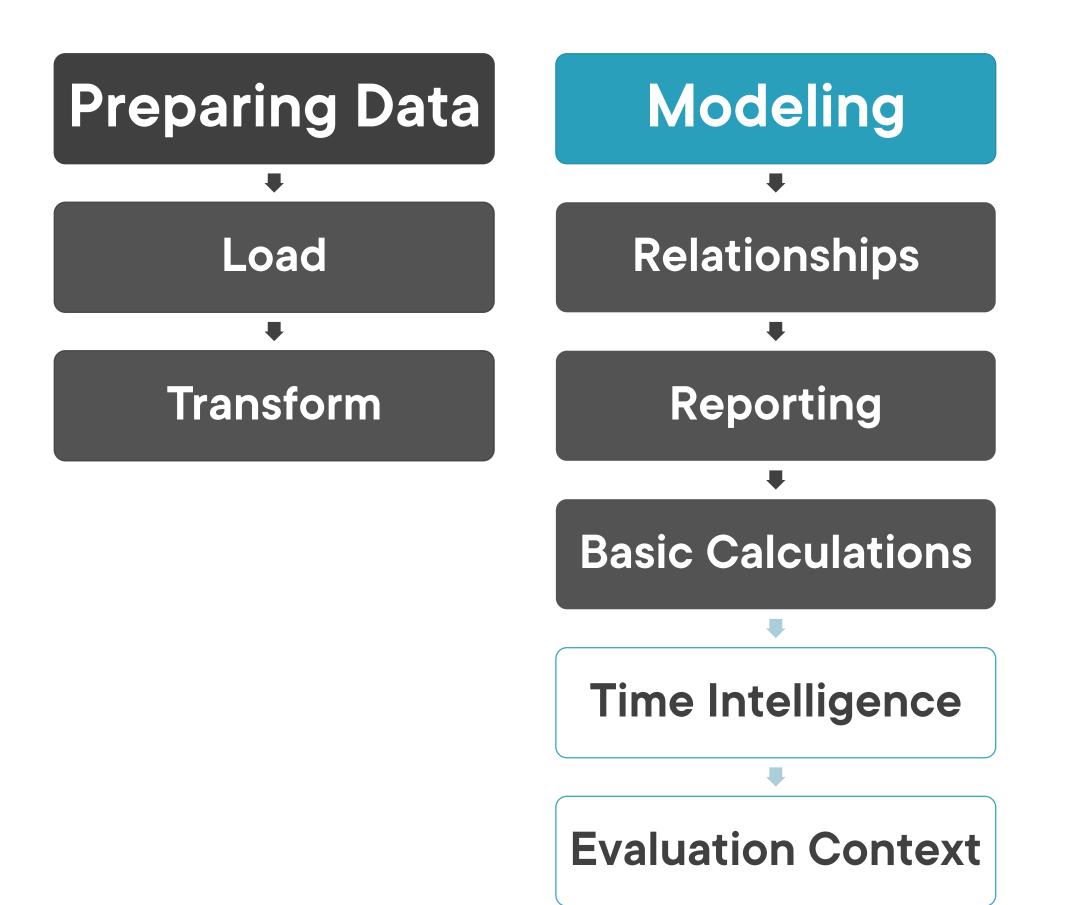






**Basic Calculations** 

- Calculated columns
- Measures



### Additional Resources



#### **DAX Basics in Power BI Desktop**

- https://bit.ly/3eBDXfA

# Getting Started with DAX Formulas in Power BI, Power Pivot, and SSAS

- https://bit.ly/3vgQVpA