Date dimensions and relationships

INTERMEDIATE DATA MODELING IN POWER BI

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datacamp

Date and time dimensions

- **Date dimensions** provide an in-built calendar and help minimize complex date operations
  - e.g. match fiscal year with calendar year
  - e.g. slice by quarter, month, week
- **Time dimensions** handle times of the day: hour, minute, second
- **Time dimensions** tend to be much less common than date dimensions

Options for creating a date dimension

Method	Advantages	Disadvantages
Host in a database	Great if you pull data from a warehouse!	Requires a database
	Easiest to share with multiple services, updating is easy	
Store data in a file	No database required, create one time	Need to create the file
	Power BI support for text files is great	Updating is not as easy as hosting in a database
Create using DAX	Allows for further customization than the prior two options	Need to write custom code
	Does not require external prep work	Some functionality may be more difficult to accomplish here

Creating a simple date dimension with DAX

```
Month_Year =


        CALENDAR(DATE(1950, 1, 1),
                 TODAY()),
```

- `CALENDAR()` is a built-in function to return all dates in a range

Creating a simple date dimension with DAX

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- `CALENDAR()` is a built-in function to return all dates in a range
- Creates `[Date]` field with each date between 1950-01-01 and today

[Date]
1950-01-01
1950-01-02
...
2021-06-30

Creating a simple date dimension with DAX

```
Month_Year =

    SELECTCOLUMNS(
        CALENDAR(DATE(1950, 1, 1),
                 TODAY()),
        "Month", MONTH([Date]),
        "Year", YEAR([Date])
    )
```

- `CALENDAR()` is a built-in function to return all dates in a range
- Creates `[Date]` field with each date between 1950-01-01 and today
- Select the columns you want to add

Month	Year
01	1950
01	1950
...	...
06	2021

Creating a simple date dimension with DAX

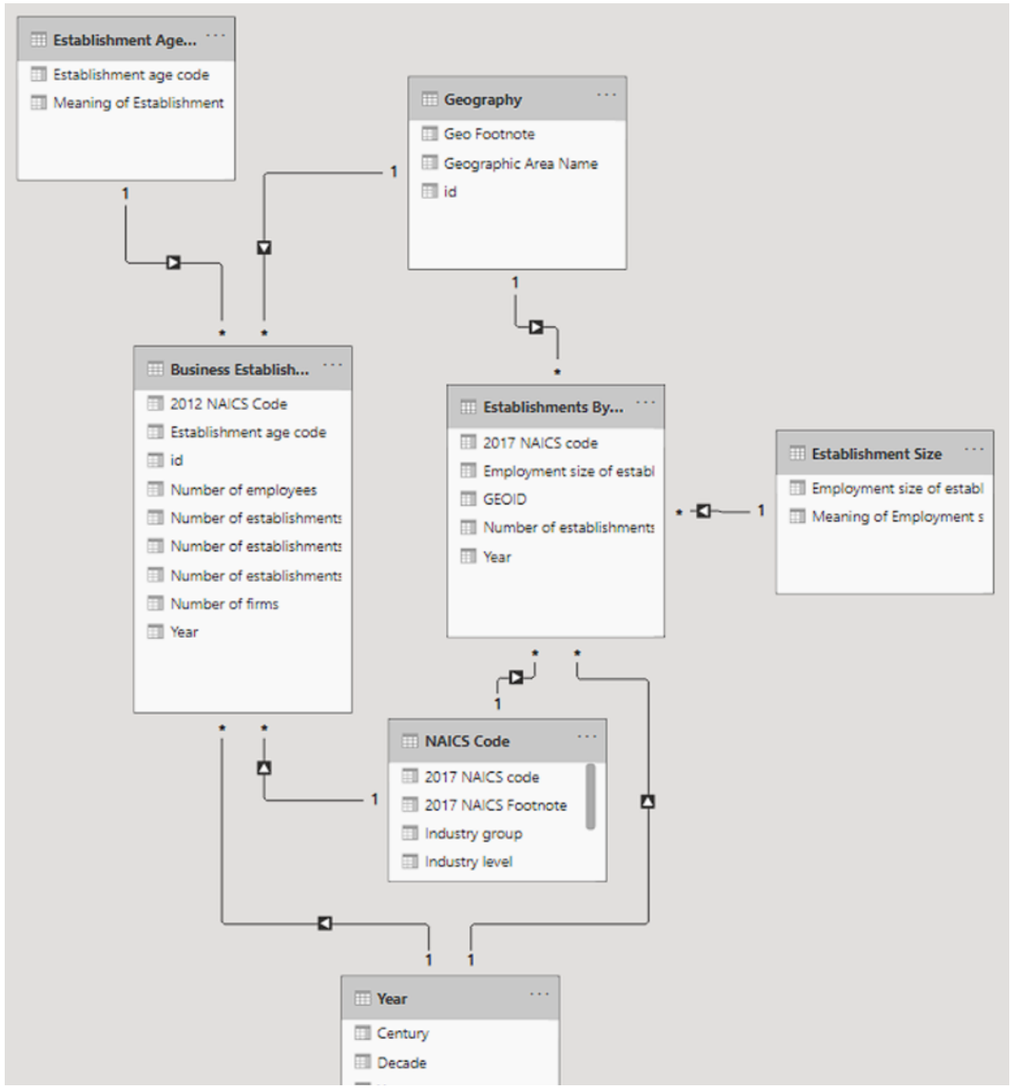
```
Month_Year =
DISTINCT(
    SELECTCOLUMNS(
        CALENDAR(DATE(1950, 1, 1),
                 TODAY()),
        "Month", MONTH([Date]),
        "Year", YEAR([Date])
    )
)
```

- `CALENDAR()` is a built-in function to return all dates in a range
- Creates `[Date]` field with each date between 1950-01-01 and today
- Select the columns you want to add
- Only keep unique rows

Month	Year
01	1950
02	1950
...	...
06	2021

Defining relationships

- Relationships allow you to **link tables** in Power BI
  - Propagate filters across tables
  - Allow for cross-table calculations
- Ways to manage relationships
  - Autodetect based on column names
  - Manually customization



Relationship keys

- Relationships are based on keys
  - One or more columns which guarantee a row is unique
- Two types of keys:
  - **Natural key**: existing column *(e.g. email)*
  - **Surrogate key**: artificial column *(e.g. ID)*
- Power BI requires **single column** relationships

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  - **Surrogate key**: artificial column *(e.g. ID)*
- Power BI requires **single column** relationships
- **Composite key**: a key made up of at least two columns

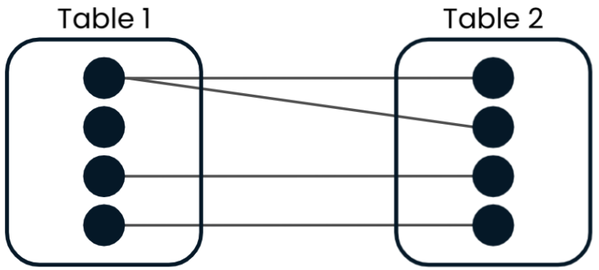
First Name	Last Name	Birth year	Value
Chris P	*Bacon*	*1996*	599
Jane	*Bonds*	*1998*	523
Dwayne	*Pipe*	*1988*	-566

Composite Key	Value
Chris P-Bacon-1996	599
Jane-Bondts-1998	523
Dwayne-Pipe-1988	-566

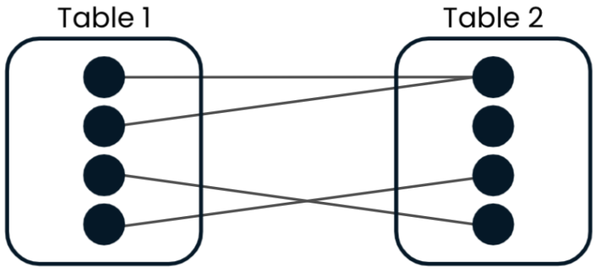
Cardinality

- A measure of the relationship between rows of two given tables
- **Many-to-one/One-to-many**: most commonly used
  - Connect **one** row from the dimension to **one or more** rows in the fact table

One-to-many



Many-to-one

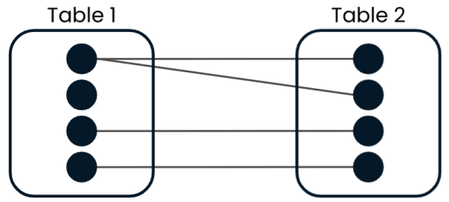


Cardinality

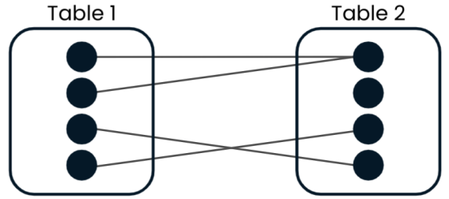
- Less common:
  - **One-to-one**

  - **Many-to-many**

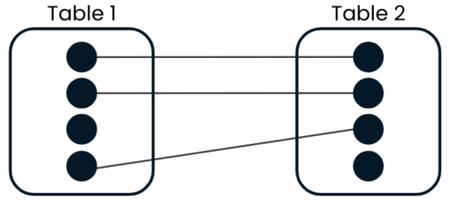
One-to-many



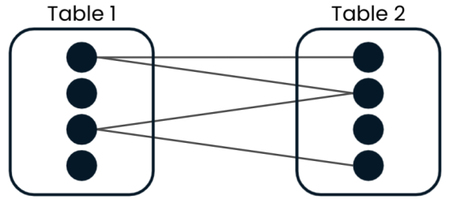
Many-to-one



One-to-one



Many-to-many



Let's practice!

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