Lab 1: Date Dimensions and Relationships

Part 1: Create a year dimension

You can download the course materials from here:

https://github.com/fenago/cts245X/tree/main/modeling_advanced

Download Power BI Desktop from here:

https://www.microsoft.com/en-us/download/details.aspx?id=58494

Open `1_1_create_year_dimension.pbix` from the Exercises folder on the Desktop.

Navigate to the *Data* view and create a new table called `Year`.

Complete the following DAX syntax to create the `Year` table, which should contain a single column `Year`, with years ranging from 1961 to today's year.

```
---- = // name of the table
DISTINCT ( // only keeps unique rows
   SELECTCOLUMNS ( // returns a table and creates new column based on expression
      ----( DATE ( ---- ), ---- ), // creates date range between 1961-01-01 and today
      "----", YEAR([----]) // creates "Year" column, extracting the years only
   )
)
```

- Navigate to the *Model* view.
- Use the *Manage relationships* feature to add a relationship between `Year` of `Business Establishment by Age` and the newly created `Year` dimension.
- Make sure that the cardinality is such that many rows in `Business Establishment by Age` may correspond with one value in `Year`.

If for some reason a new table is not showing up in the Model view, you can manually add a relationship using the Manage relationships icon in the Home menu. Click "New..." and select the tables and columns where you want to define the relationship.

- Navigate to the *Report* view.
- Add a *Card* visual, with *Fields* set to `Number of firms` from the `Business Establishment by Age` table.
- Add a `Year` filter (from the `Year` dimension) and set to 1983 only.

How many manufacturing firms were there in 1983, according to the dataset? Answer in the form of ###K, where K represents thousands.

Part 2: Extend the year dimension

In the *Data* view, add a new column called `Decade` in the `Year` table, with the formula `'Year'[Year] - MOD('Year'[Year], 10)`.

- In the *Report* view, add a *Clustered column chart* visual to the `Business Establishments` page.
- The *Values* should be the maximum of `Number of firms` from the `Business Establishment by Age` table.
- The *Axis* should be `Decade` from the `Year` table.

What was the maximum amount of firms during the 1980s?

Part 3: Composite key relationships

Open `Summary Statistics for Manufacturing.txt` in Power Query.

- Change the data type for `Geography Summary` and `GeographyVariant` to "Text".
- Select `Geography Summary`, `GeographyVariant`, and `GeographyNation` (in this order) and merge the columns.
- Make sure that you keep the separator as ""--None--"". Call the new column `GEO_ID`.

Select *Close & Apply* to exit Power Query. Navigate to the *Model* view and review the relationships of the schema. Note that there are two fact tables now: one with `id` present in the raw data, one where you created a `GEO_ID` key yourself.

If for some reason a new table is not showing up in the Model view, you can manually add a relationship using the Manage relationships icon in the Home menu. Click "New..." and select the tables and columns where you want to define the relationship.

Add a relationship between the `Geography` dimension using the `id` column and the `Summary Statistics for Manufacturing` fact table.

What cardinality did Power BI set between the 'Geography' dimension and the 'Summary Statistics for Manufacturing' table?

- ○ One-to-many
- ○ Many-to-one
- ○ One-to-one