



# What is Data Modeling



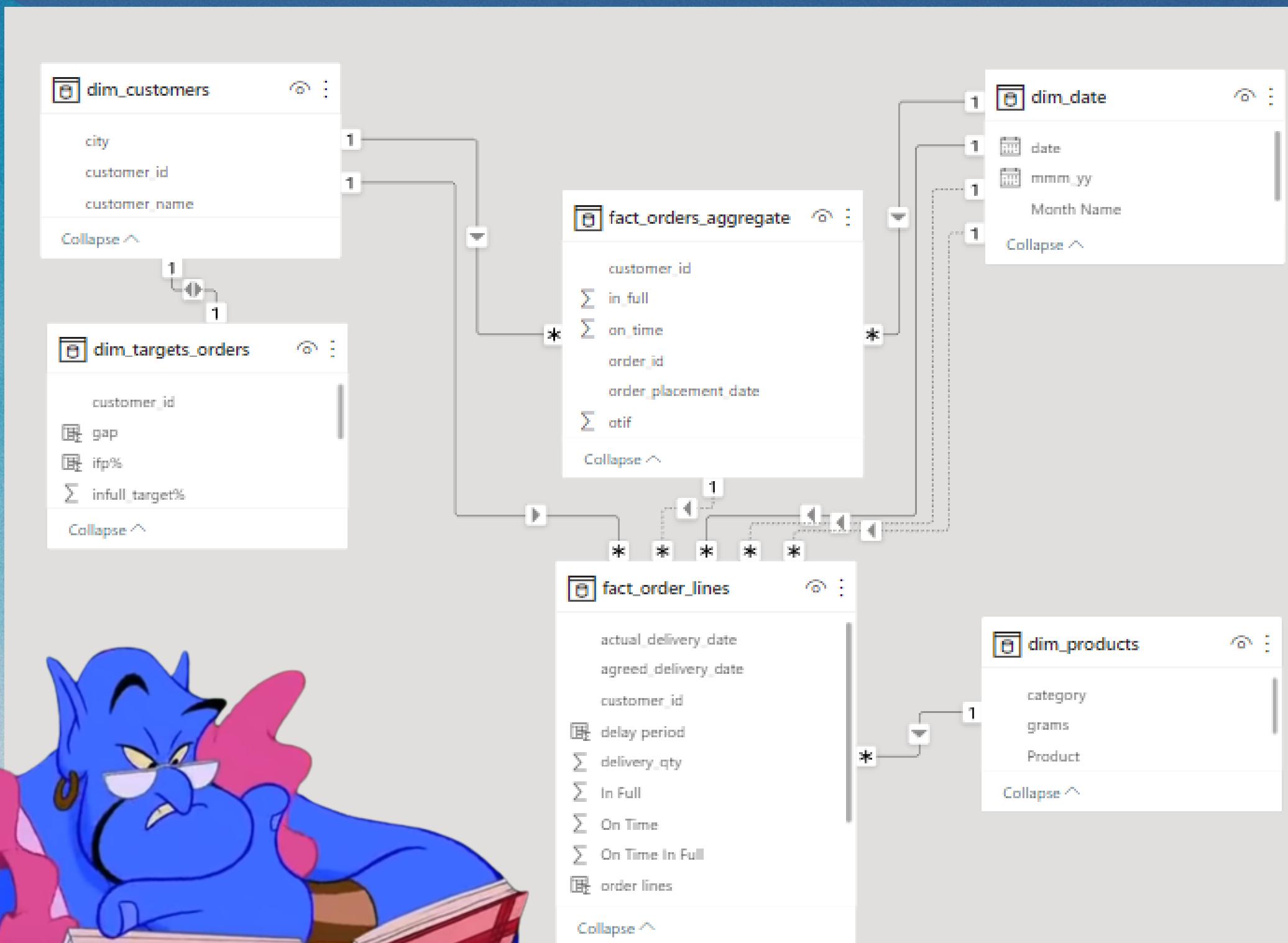


Today, let's understand  
about data modeling



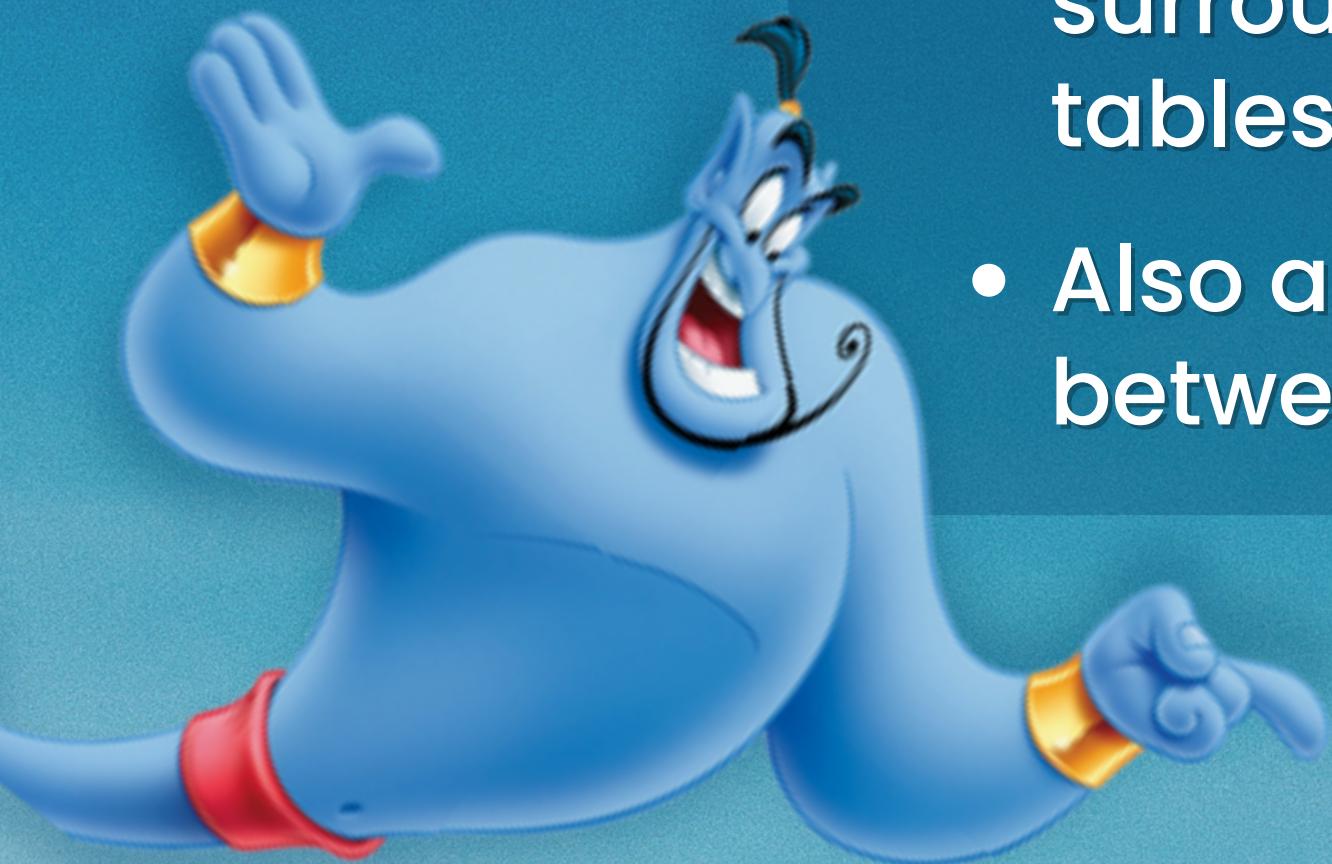


# This is how Data model looks





- It consists of fact tables surrounded by dimension tables.
- Also all the relationships between the tables.



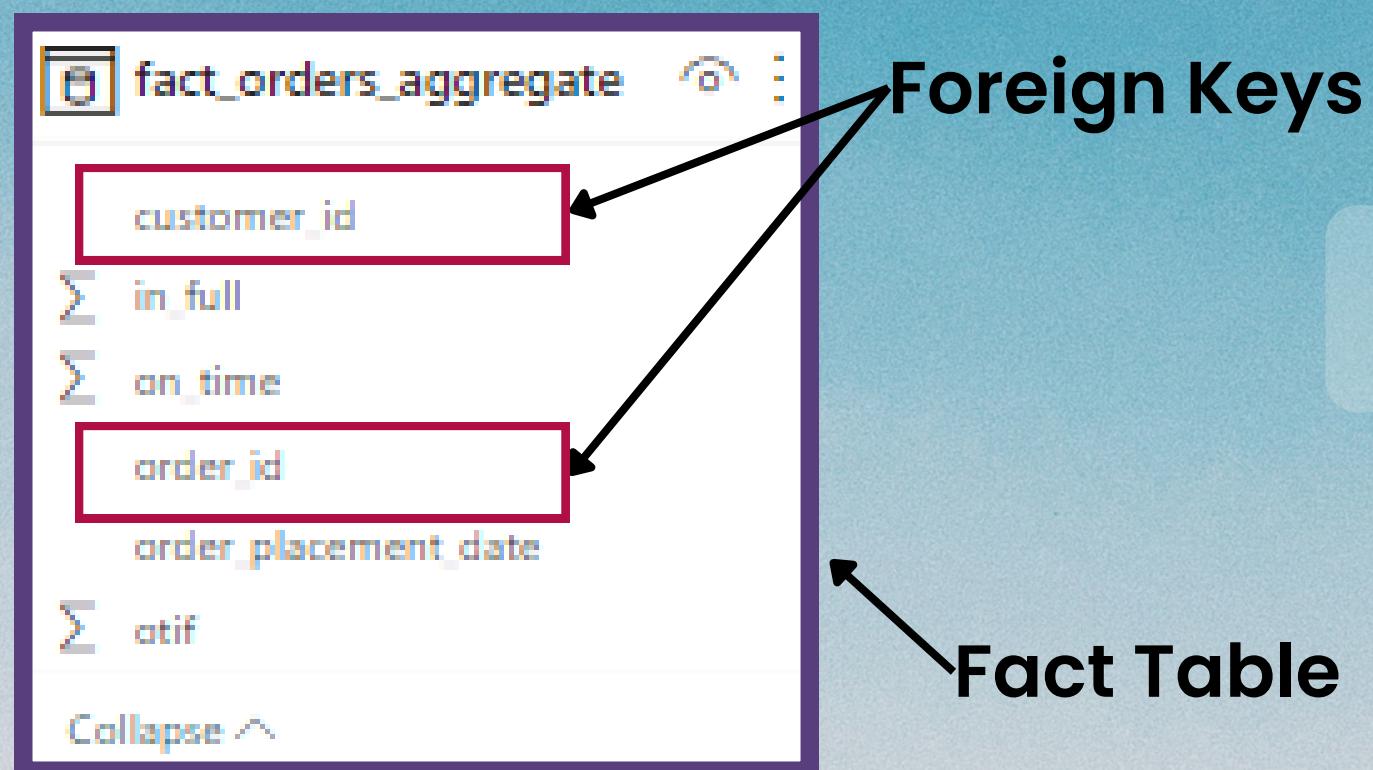
I have no idea about all of these.  
Genie, can you explain them in detail?





# Fact Table

- It consists of measurements, metrics or facts of a business process.
- It generally contains transactional data.
- A fact table has two types of columns: those that contain **facts** and those that are a **foreign key** to dimension tables.
- The primary key of a fact table is usually a composite key that is made up of all of its foreign keys.



Of course  
Your Highness



Primary Key : {customer\_id, order\_id}



# Example

Sales	⋮
$\sum$ amount	
customer_id	
date	
product_id	
$\sum$ qty	
Collapse ^	

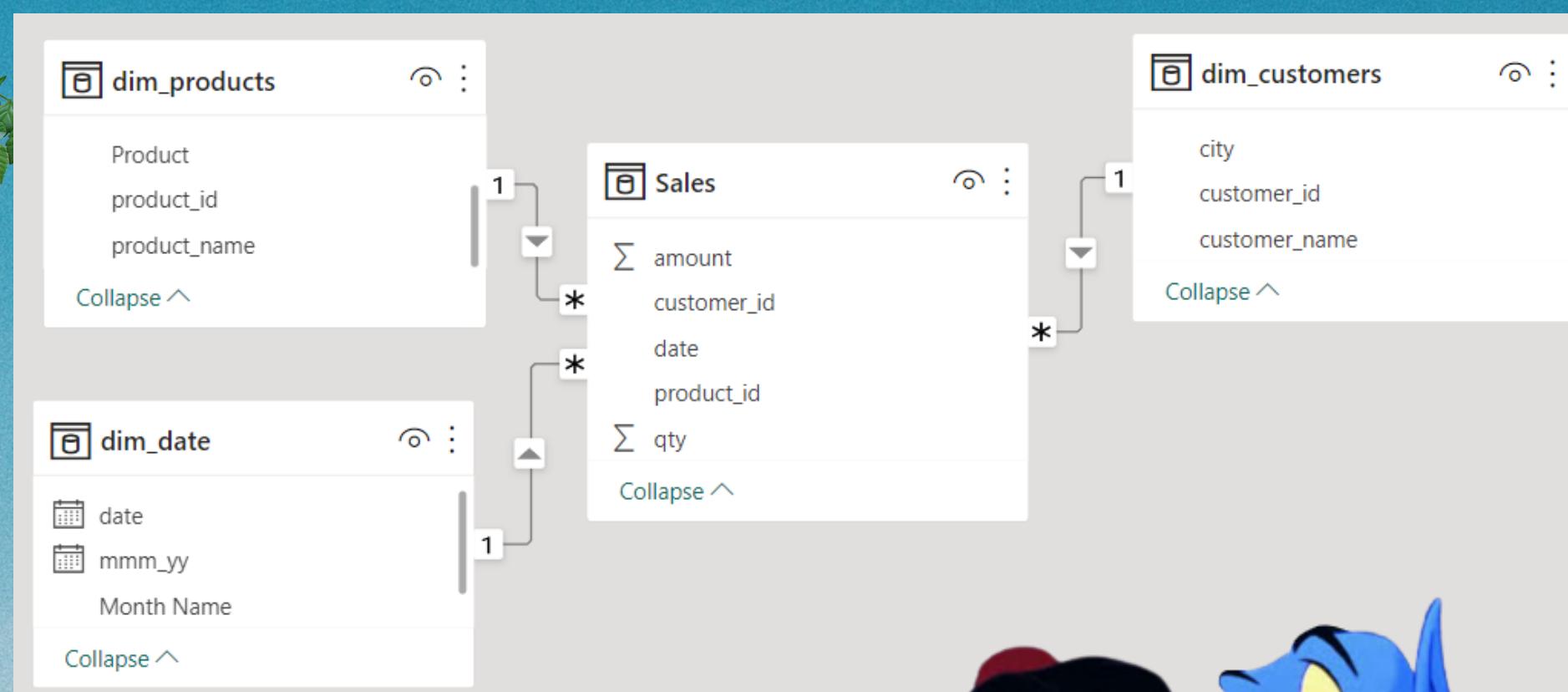


A fact table stores information about things that happened.

**Sales** is a fact table that contains sales of a store like how many of each product were sold and how much money the store made from each sale.



From the Sales(fact) table, we get data about each transaction.  
How can I know which product is being sold more or which city has produced more revenue?



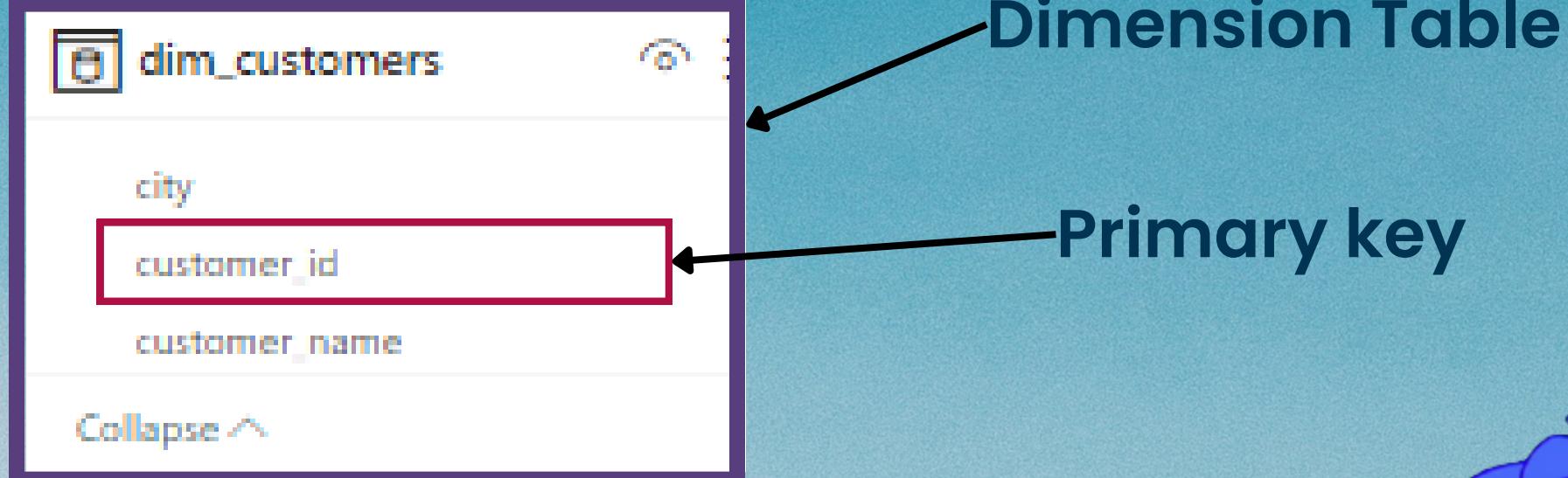
Fact tables are linked to other tables called dimension tables. Dimension tables make it possible to perform these types of queries and analyses.





# Dimension Table

- It consists of attributes that describe the object of a fact table.
- It has a primary key column that uniquely identifies each dimension record.
- The dimension table is associated with a fact table using this key.



A dim\_Customer table store information about the people who made the purchases.





- Here dim\_customers is a dimension table, and Sales is a fact table
- To make a relationship between tables, the tables should consist of a common column attribute.
- Here the common column attribute is customer id, and the relationship is 1 to many.

dim_customers	
city	
customer_id	1
customer_name	*
<a href="#">Collapse ^</a>	

Sales	
$\sum$	amount
	customer_id
	date
	product_id
$\sum$	qty
<a href="#">Collapse ^</a>	



# What is 1 to many relationship Genie?

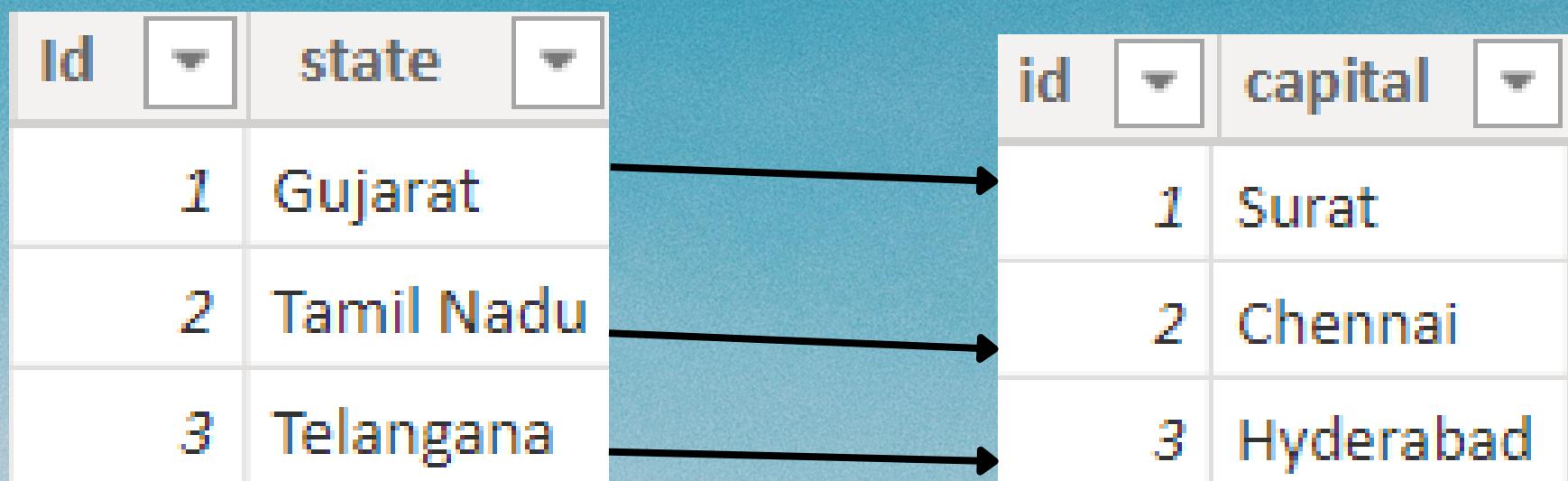
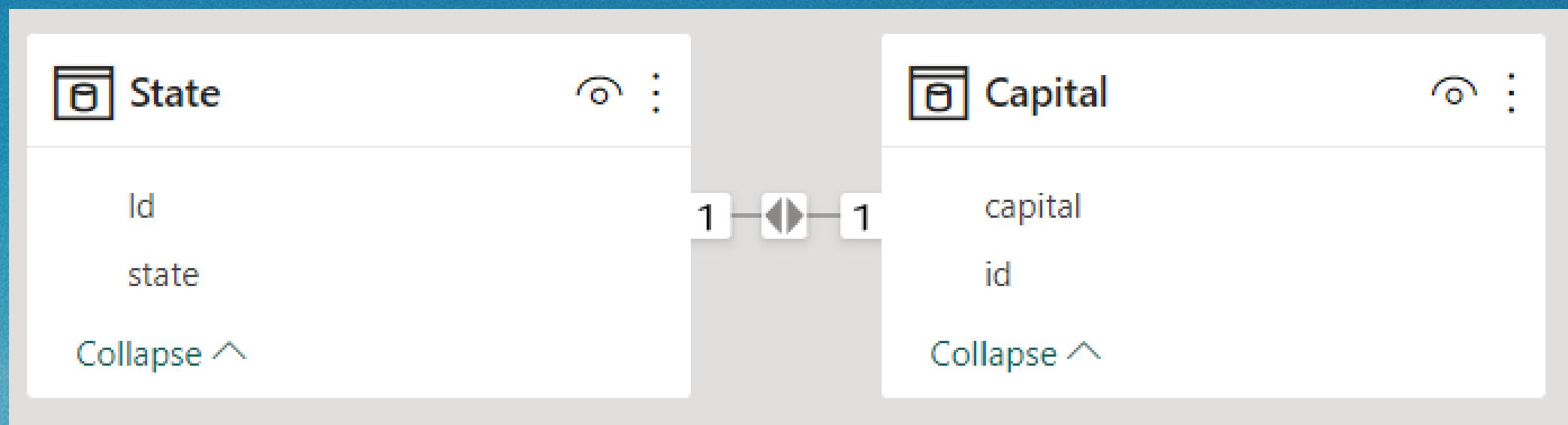
Oh no! I forgot to tell you about types of relationships

There are 4 types of relationships:

- One-to-One relationship
- One-to-Many relationship
- Many-to-One relationship
- Many-to-Many relationship



# 1 to 1 relationship



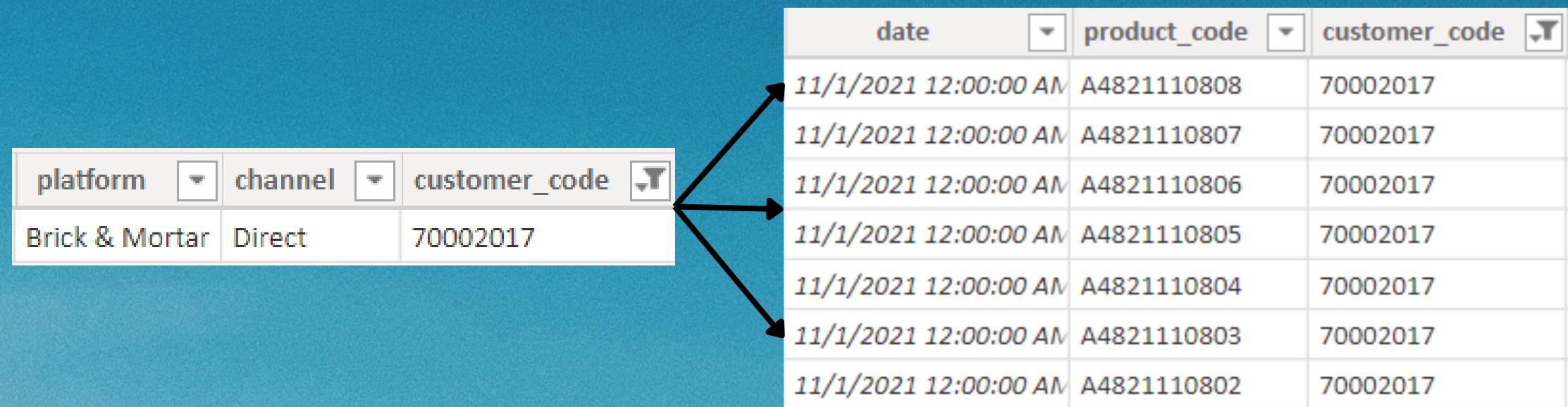
The diagram shows two tables representing the State and Capital entities. The State table (left) has columns for Id and state, with data rows for Gujarat (Id 1), Tamil Nadu (Id 2), and Telangana (Id 3). The Capital table (right) has columns for id and capital, with data rows for Surat (id 1), Chennai (id 2), and Hyderabad (id 3). Three arrows point from the State table rows to the Capital table rows, specifically connecting Gujarat to Surat, Tamil Nadu to Chennai, and Telangana to Hyderabad, demonstrating a 1 to 1 mapping.

Id	state
1	Gujarat
2	Tamil Nadu
3	Telangana

id	capital
1	Surat
2	Chennai
3	Hyderabad

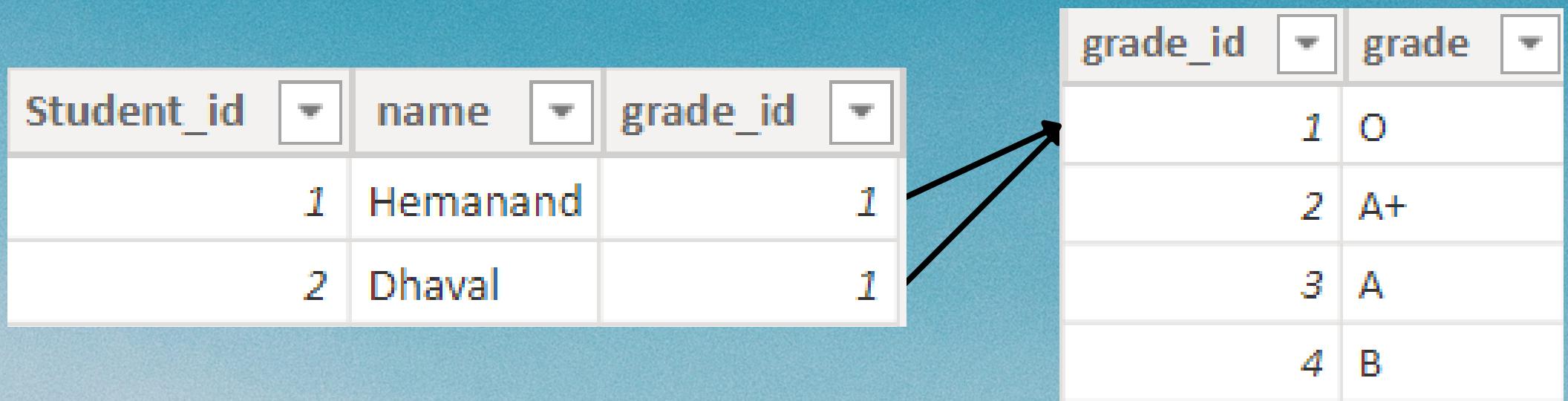
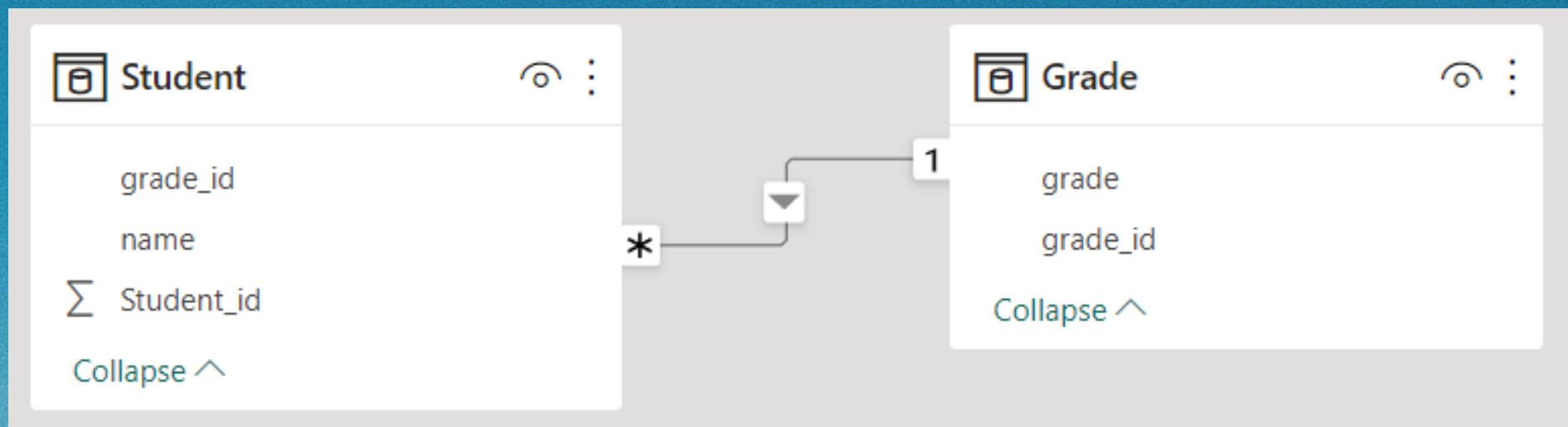
Each row in one table has only mapped with one row in the second table.  
Each State has only one capital.

# 1 to many relationship



The Customer code "70002017" in the dim\_customer table is mapped with 'n' number of rows with the same customer code in fact\_orders\_aggregate. This is called 1 to many relationship.

# Many to 1 relationship



The screenshot shows two tables. The left table, 'Student', has columns for Student\_id, name, and grade\_id. It contains two rows: one for student 1 named Hemanand with grade\_id 1, and another for student 2 named Dhaval with grade\_id 1. The right table, 'Grade', has columns for grade\_id and grade. It contains four rows: grade\_id 1 with grade O, grade\_id 2 with grade A+, grade\_id 3 with grade A, and grade\_id 4 with grade B. Two arrows point from the grade\_id column of the Student table to the grade\_id column of the Grade table, specifically from the value 1 to both the first and second rows of the Grade table, illustrating that multiple students can share the same grade.

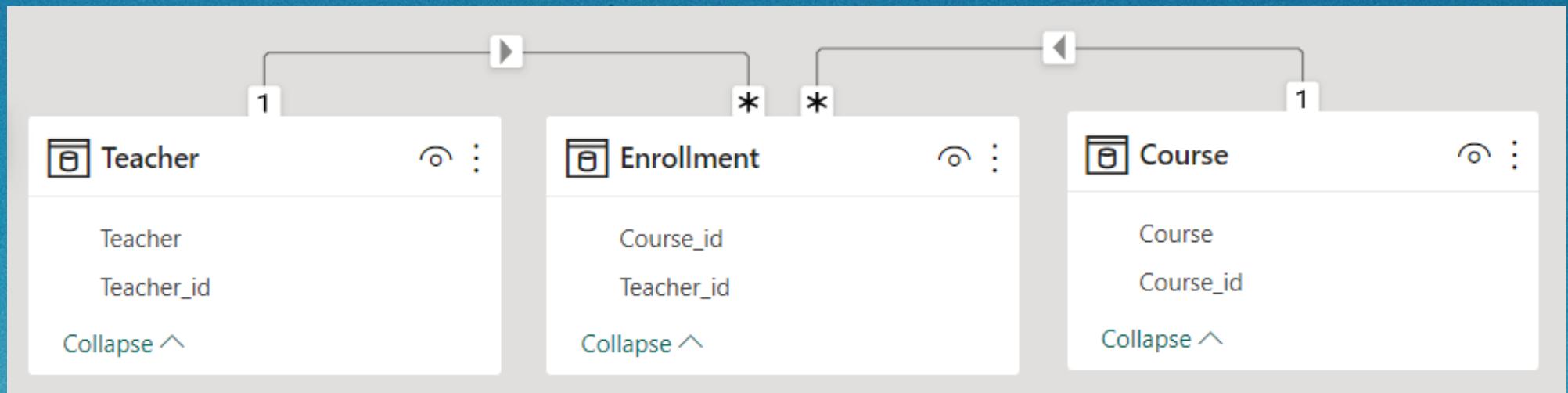
Student_id	name	grade_id
1	Hemanand	1
2	Dhaval	1

grade_id	grade
1	O
2	A+
3	A
4	B

Multiple rows in first table has mapped with single related rows in a second table.  
Different students get the same grade.



# Many to many relationship



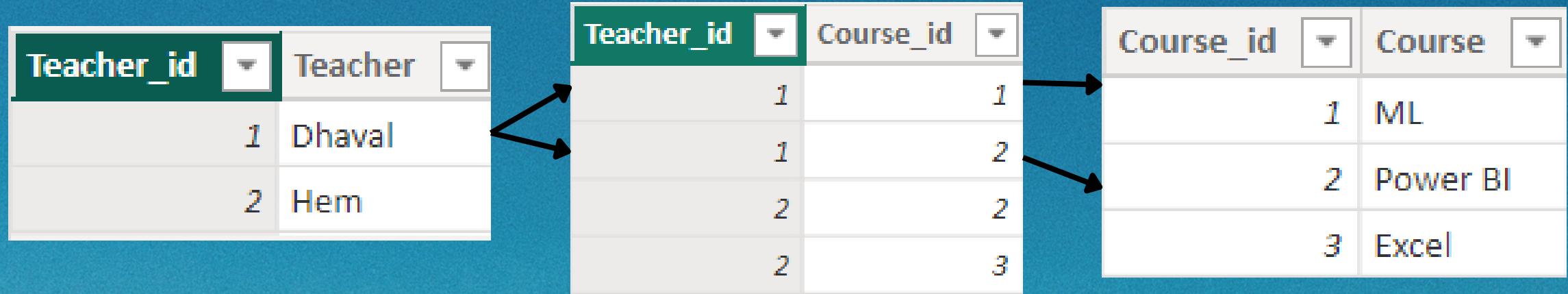
Multiple records of one table are related to multiple records of another table.  
More than one teacher can teach multiple courses

Dhaval teaches ML,  
Power BI

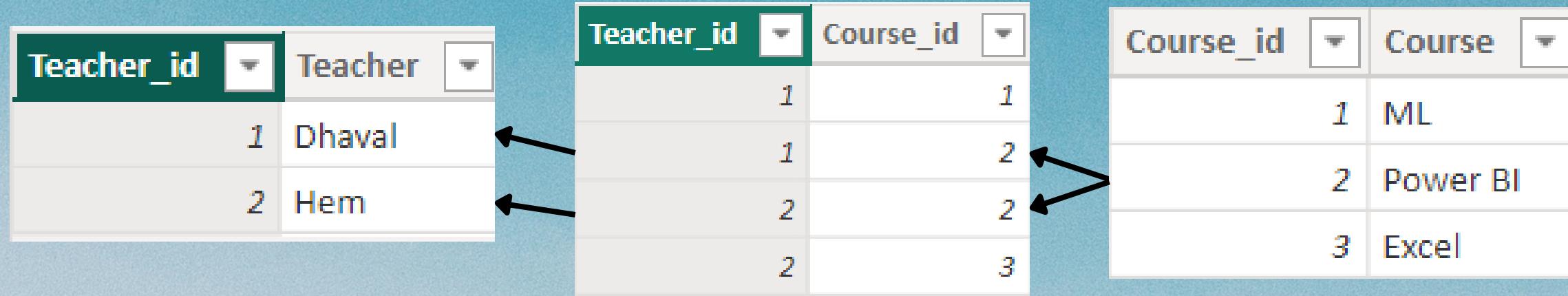


Power BI is taught by  
Dhaval and Hem





Dhaval teaches ML, Power BI



Power BI is taught by Dhaval and Hem



/ codebasics

codebasics.io