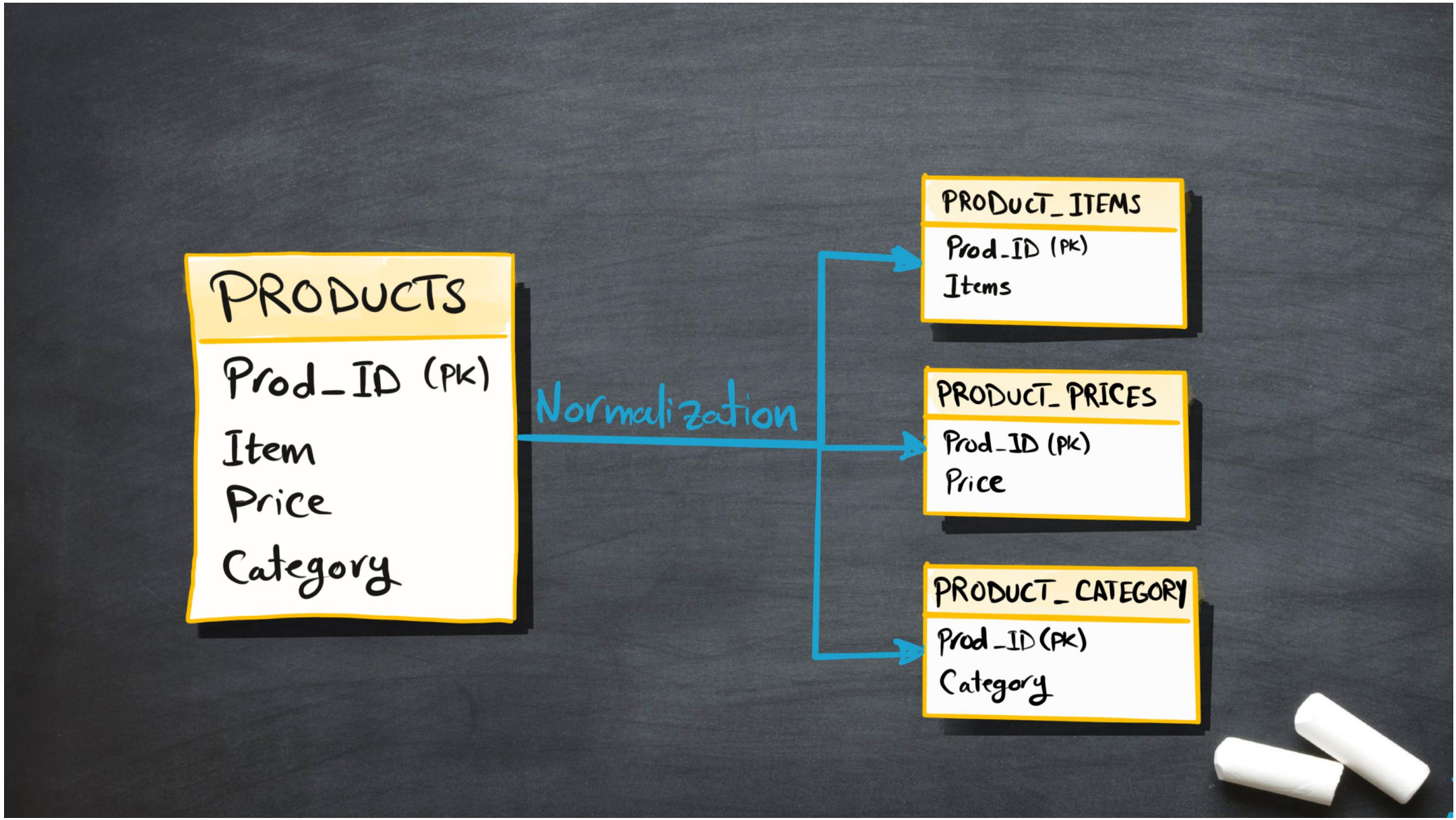
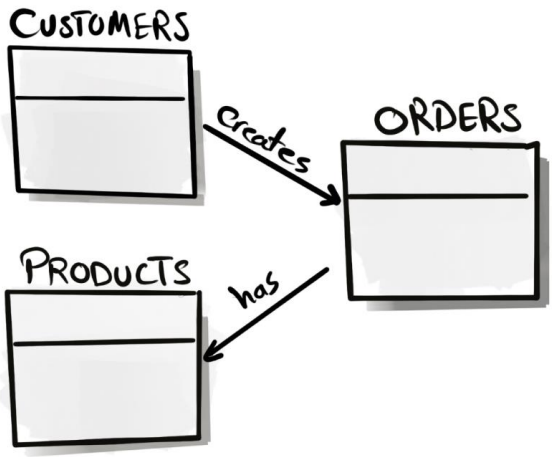
Data Normalization



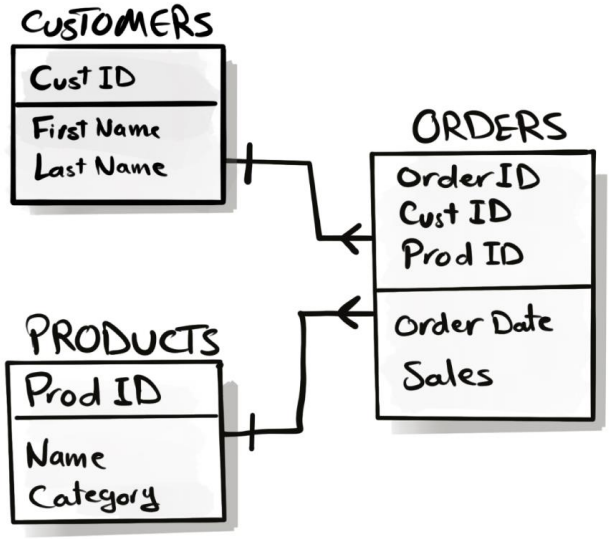
3 Types of Data Models

DATA WITH BARAA

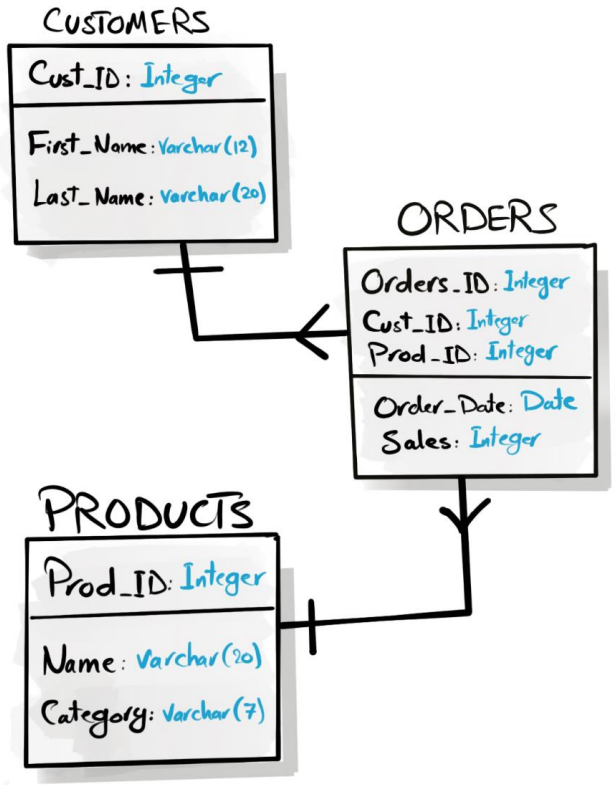
Conceptual Data Model



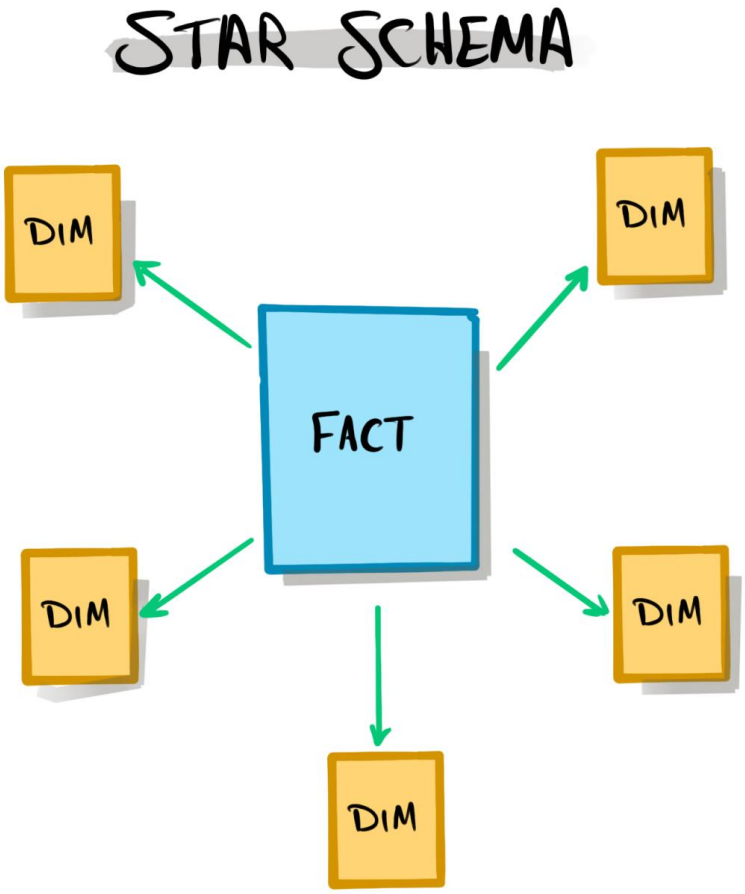
Logical Data Model

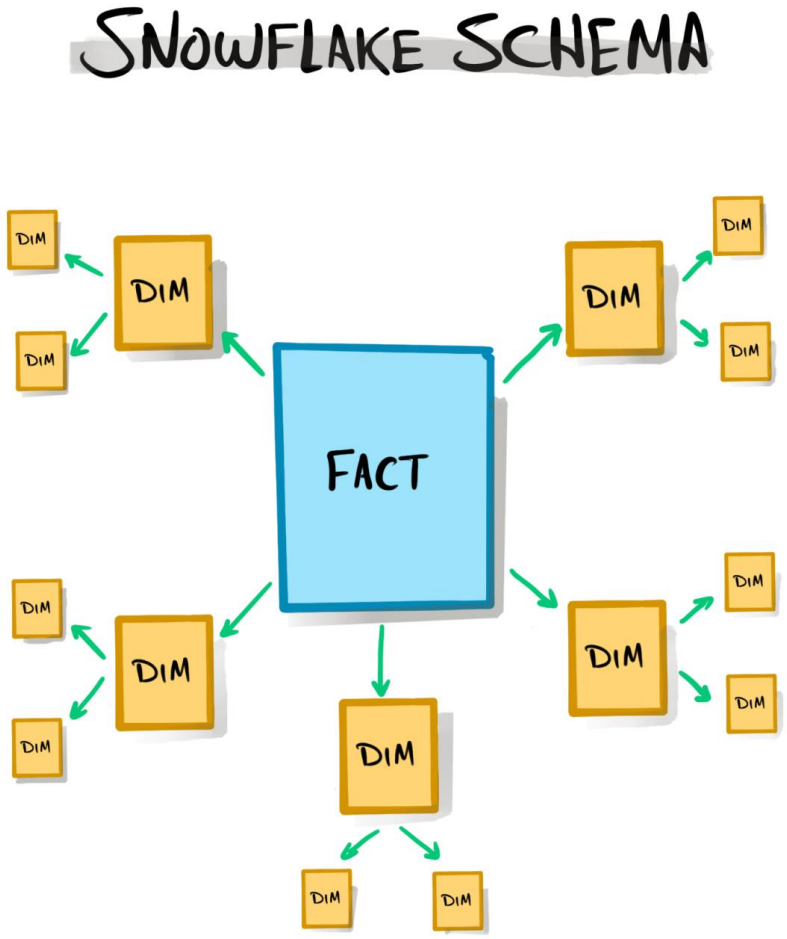


Physical Data Model



Multi-Dimensional Data Models





Training Dataset Data Model

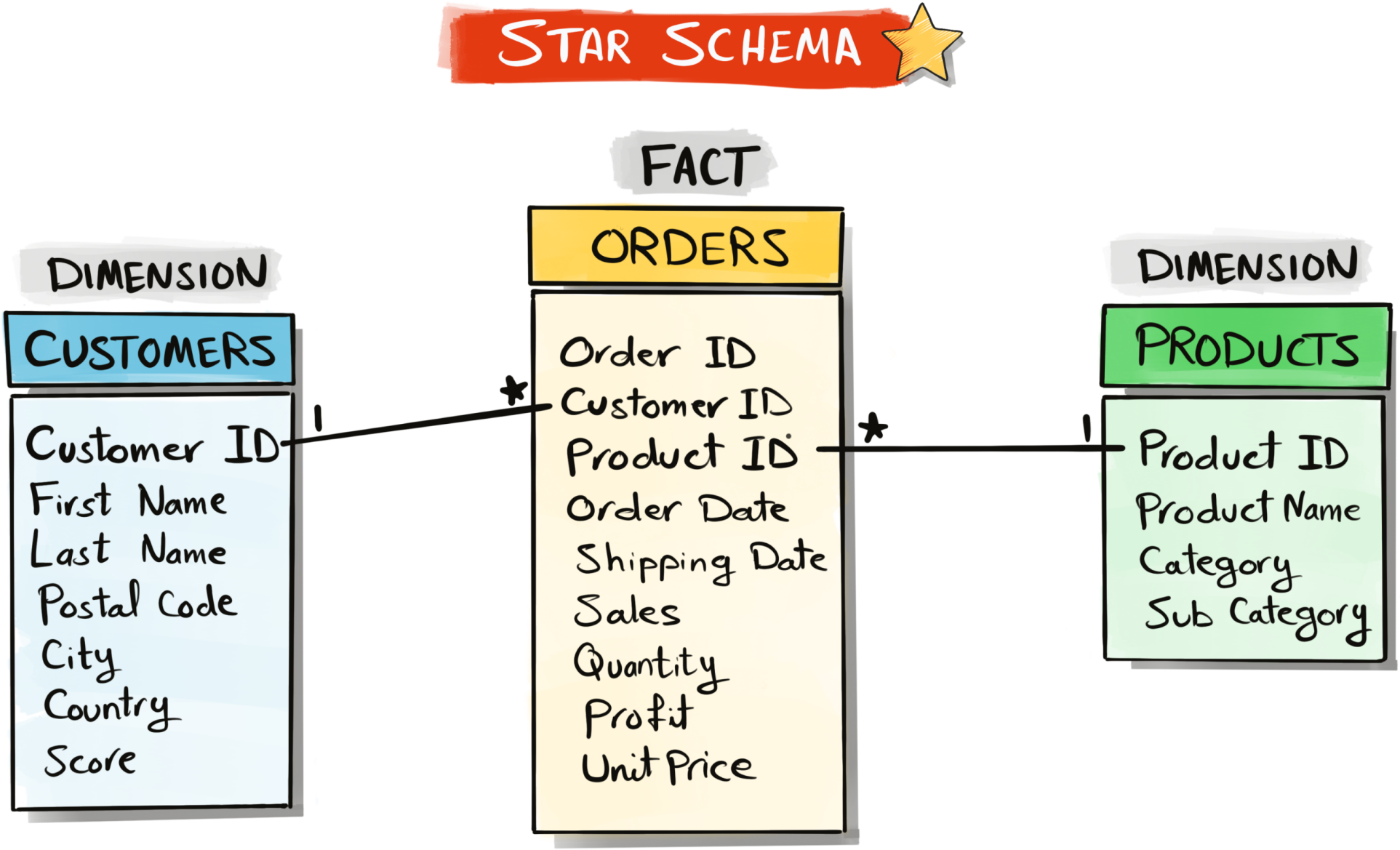
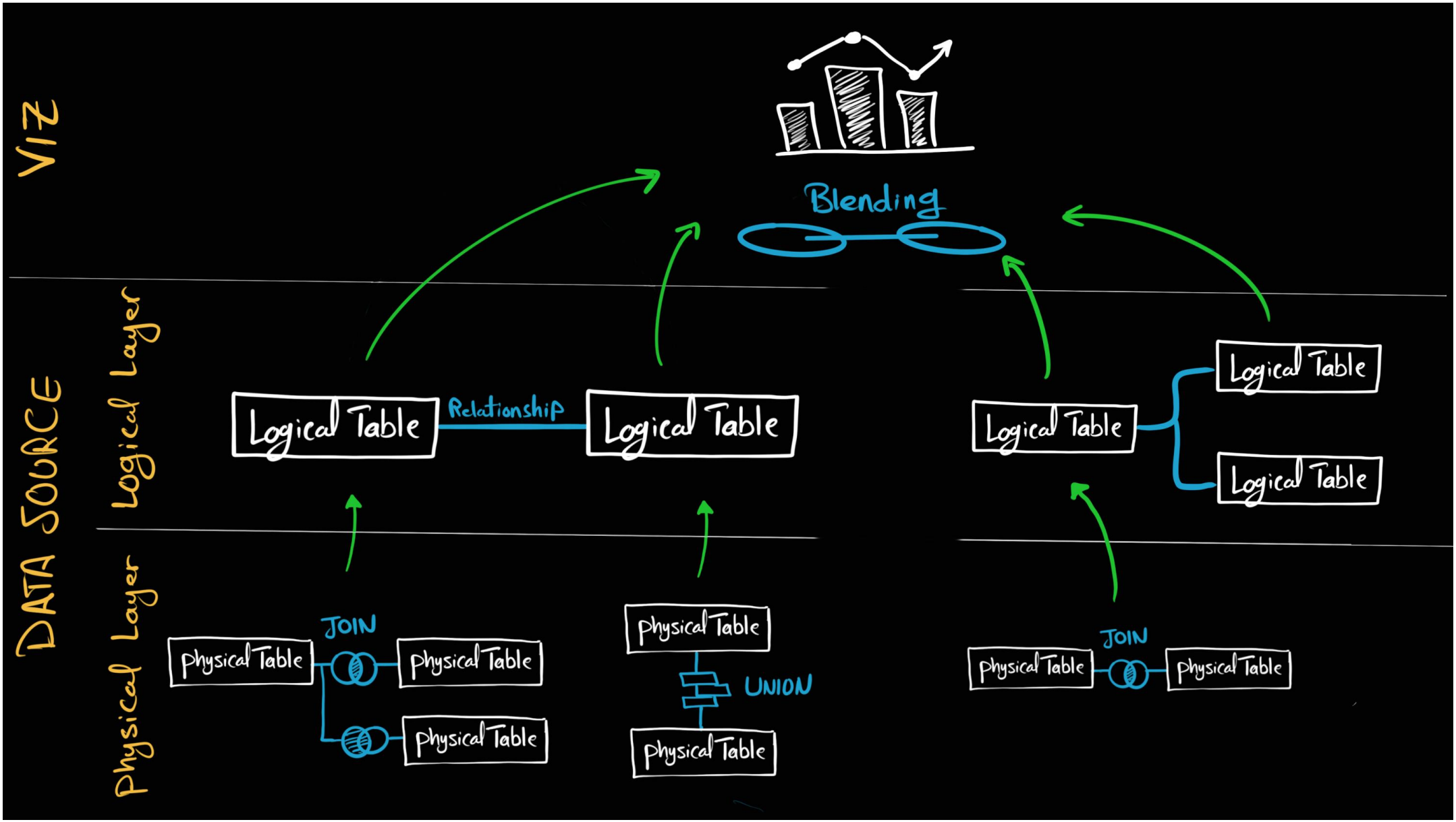
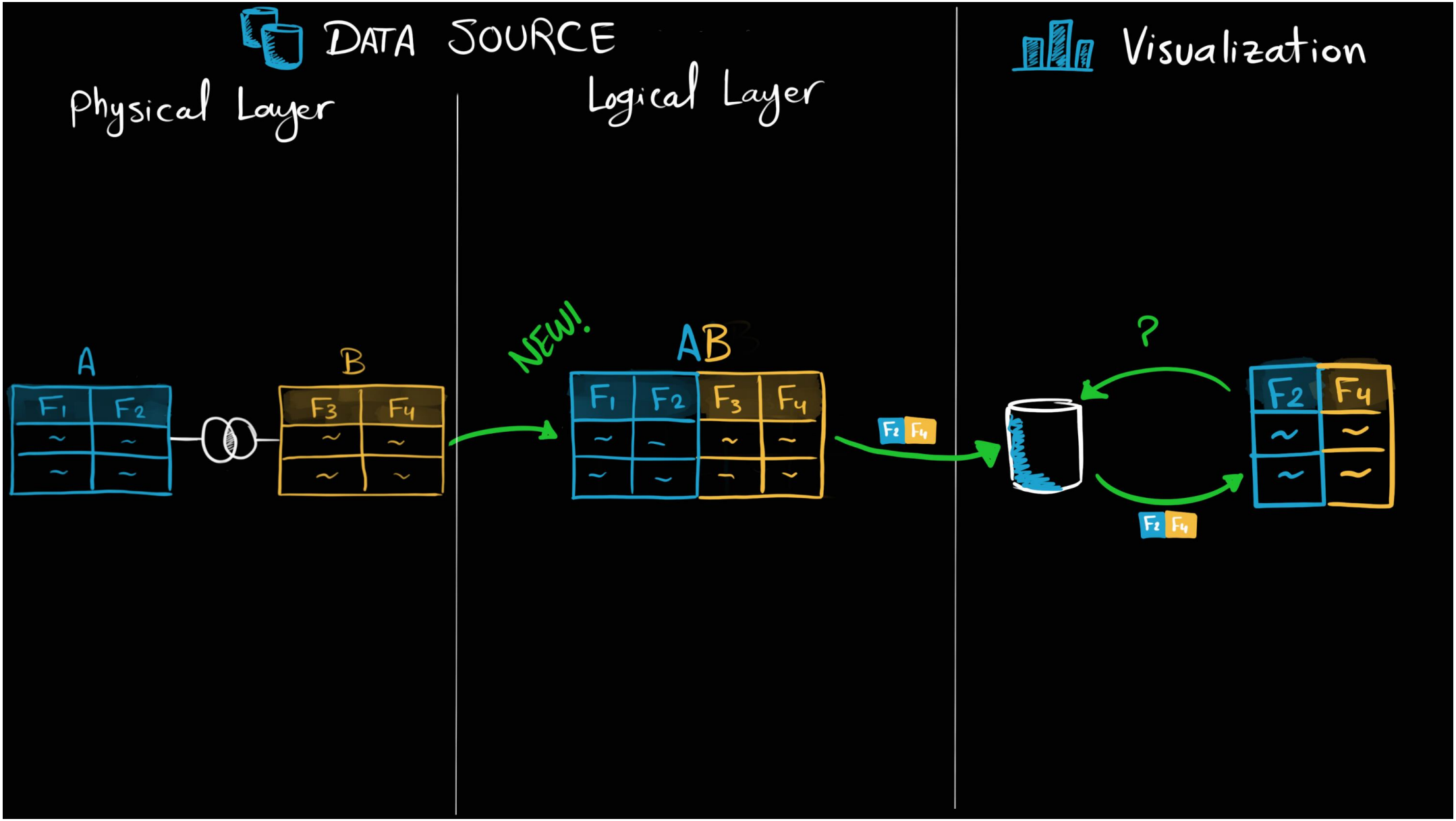


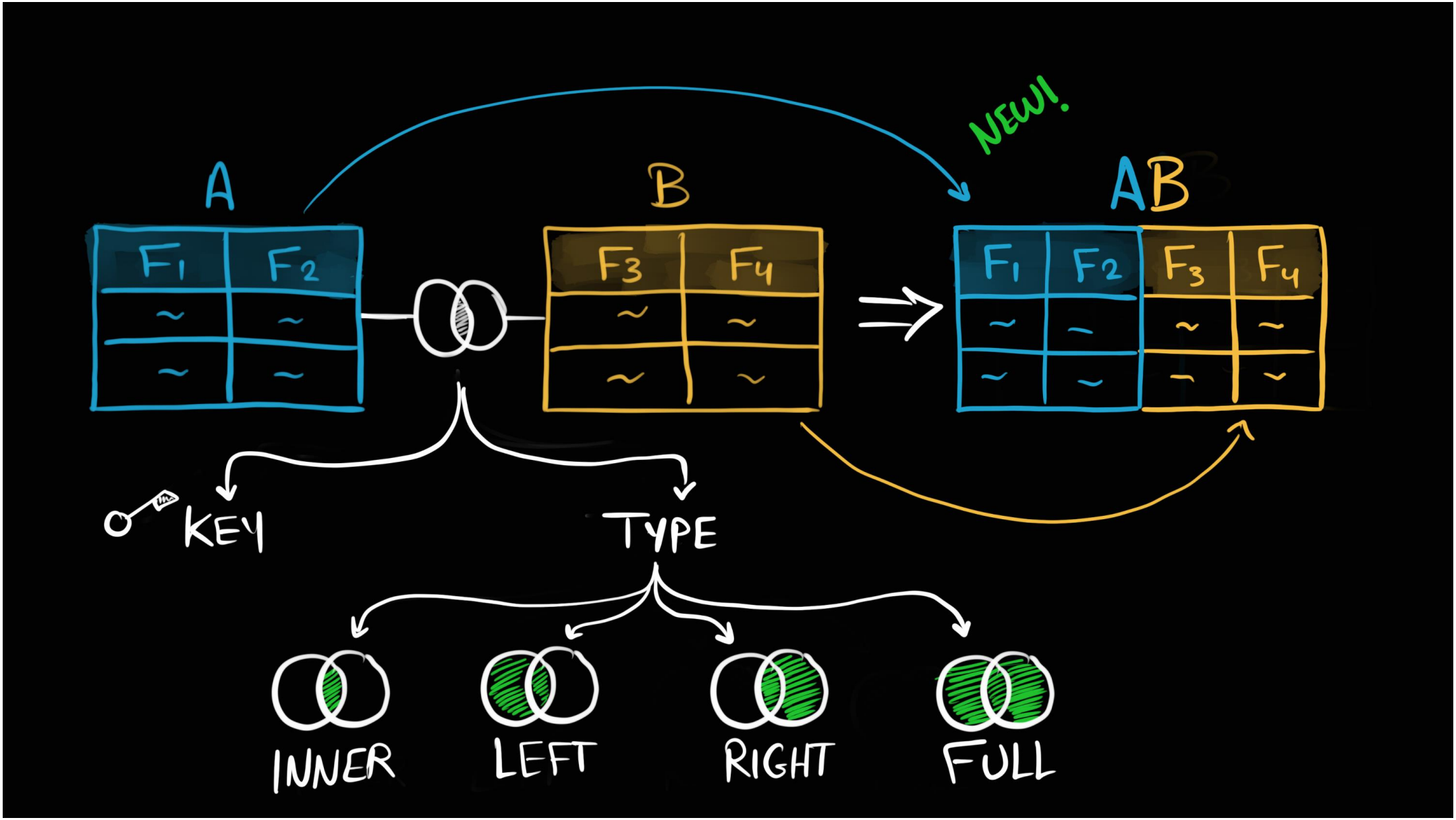
Tableau Data Models



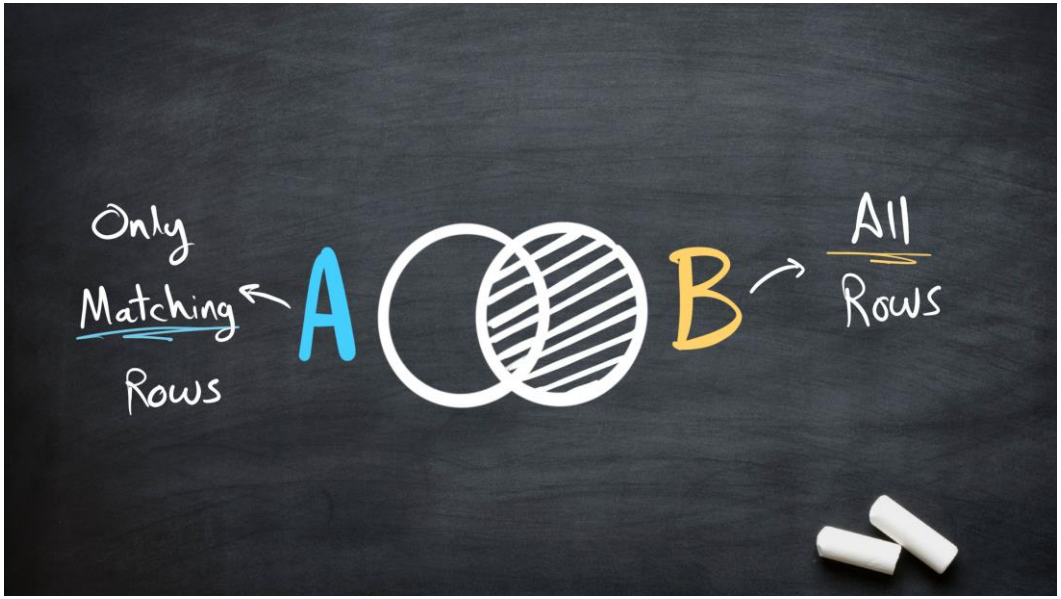
JOINS

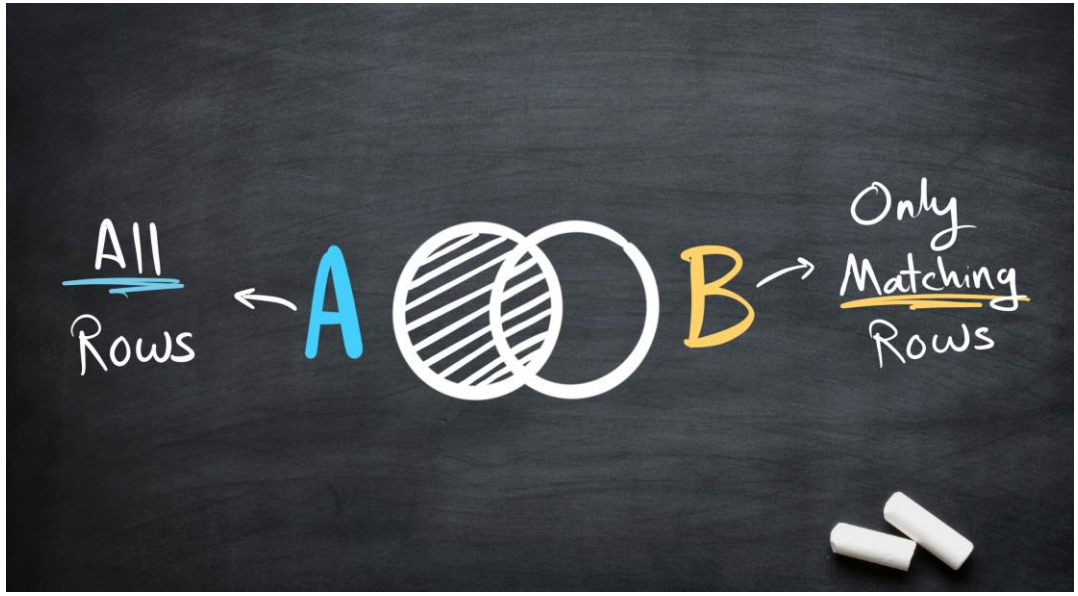

DATA SOURCE
Physical Layer
Logical Layer
Visualization
A
B
NEW!
AB
?

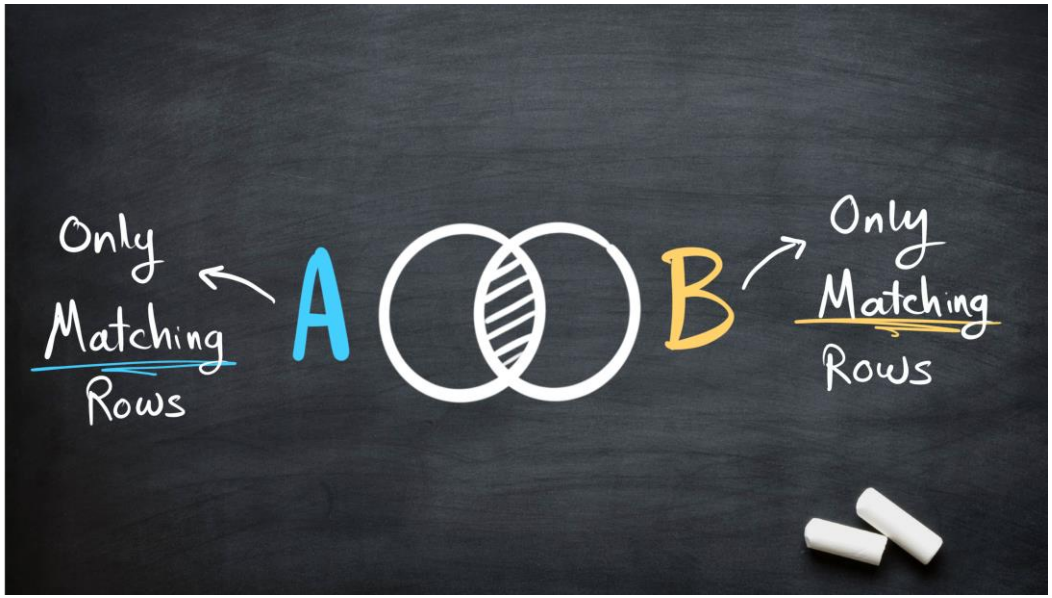
JOINS

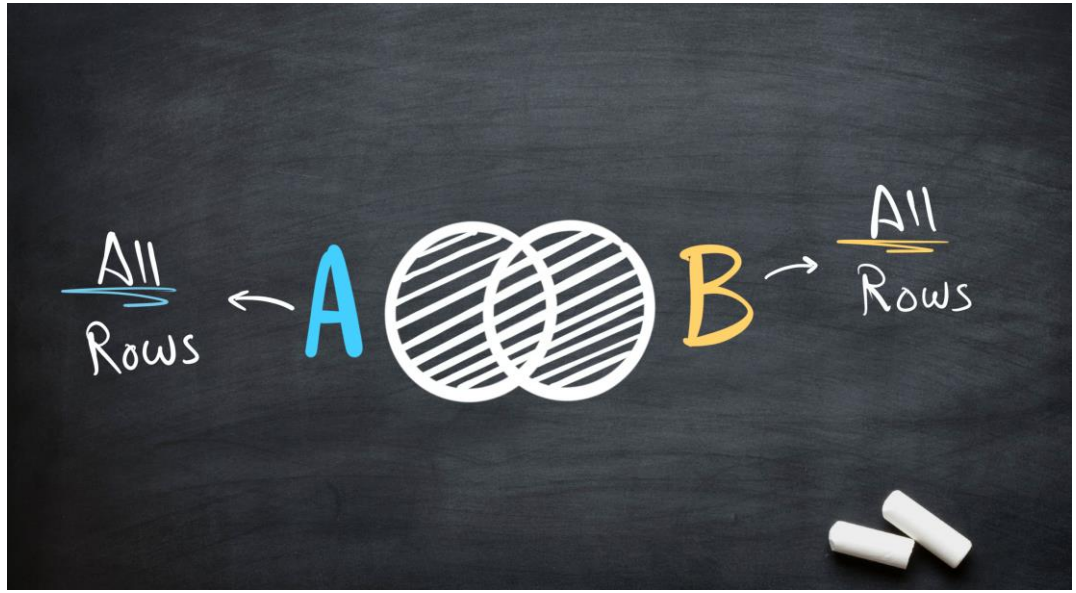


JOIN TYPES


Only
Matching
Rows
A
B
All
Rows


All
Rows
A
B
Only
Matching
Rows


Only
Matching
Rows
A
B
Only
Matching
Rows


All
Rows
A
B
All
Rows

JOIN | How it Works

CustomerNames

ID	Name
1	Maria
2	John

CustomerAges

ID	Age
1	20
3	35

Inner

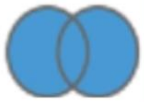
ID	Name	ID	Age
1	Maria	1	20

Left

ID	Name	ID	Age
1	Maria	1	20
2	John	NULL	NULL

Right

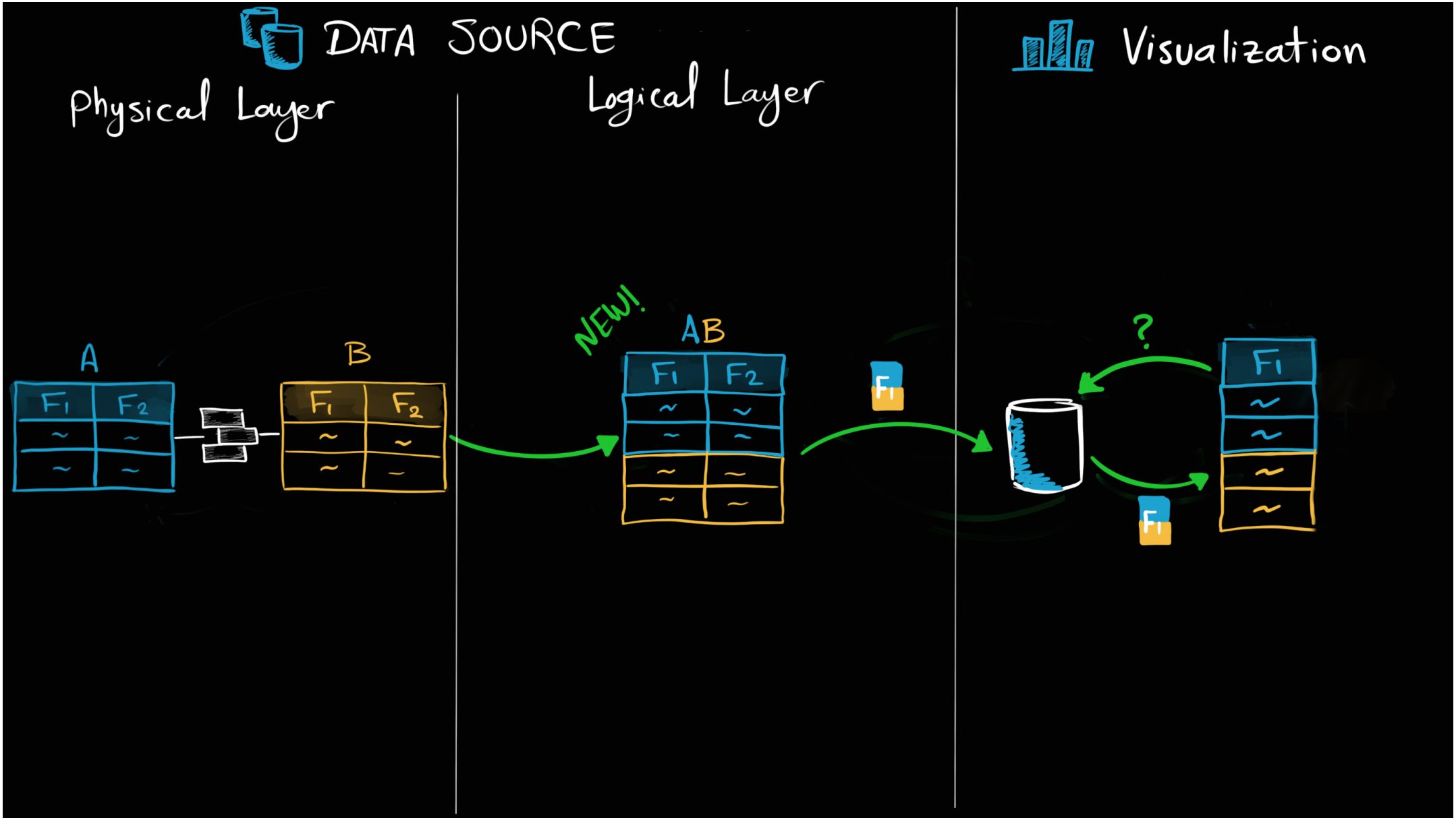
ID	Name	ID	Age
1	Maria	1	20
NULL	NULL	3	35



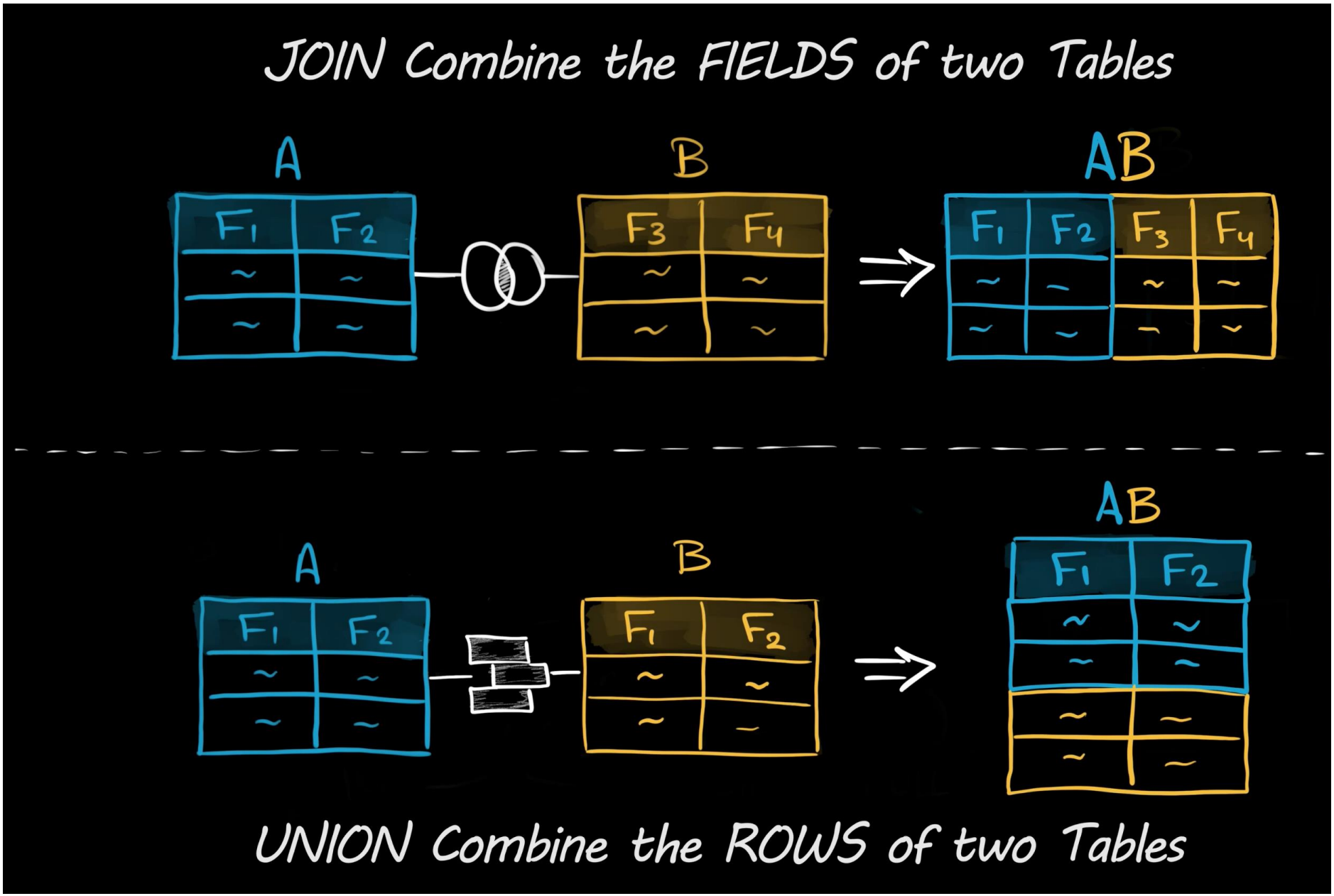
Full

ID	Name	ID	Age
1	Maria	1	20
2	John	NULL	NULL
NULL	NULL	3	35

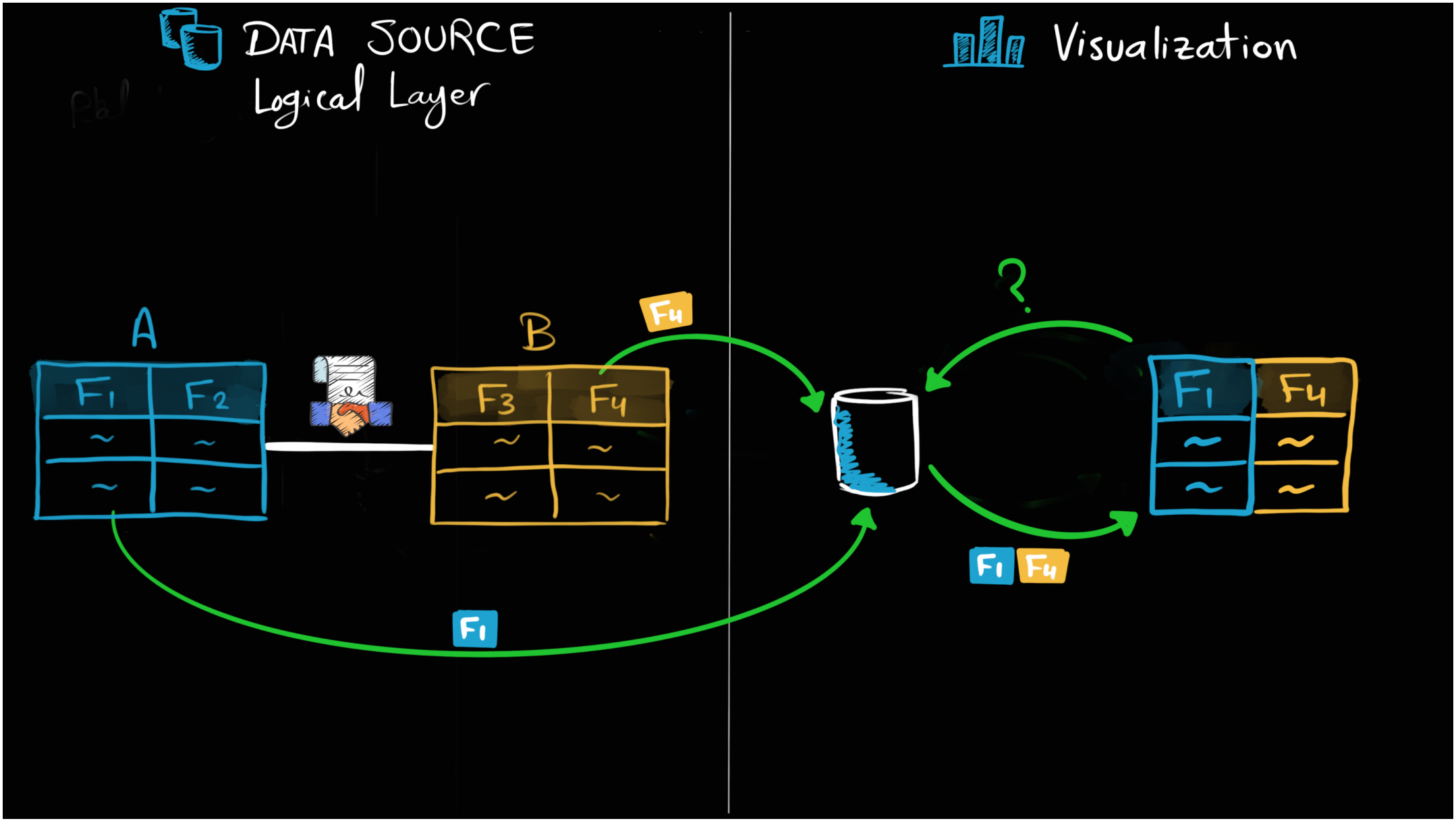
UNION


DATA SOURCE
Physical Layer
Logical Layer
Visualization
A
F1
F2
B
F1
F2
NEW!
AB
F1
F2
F1
?
F1
F1

JOINS vs UNION

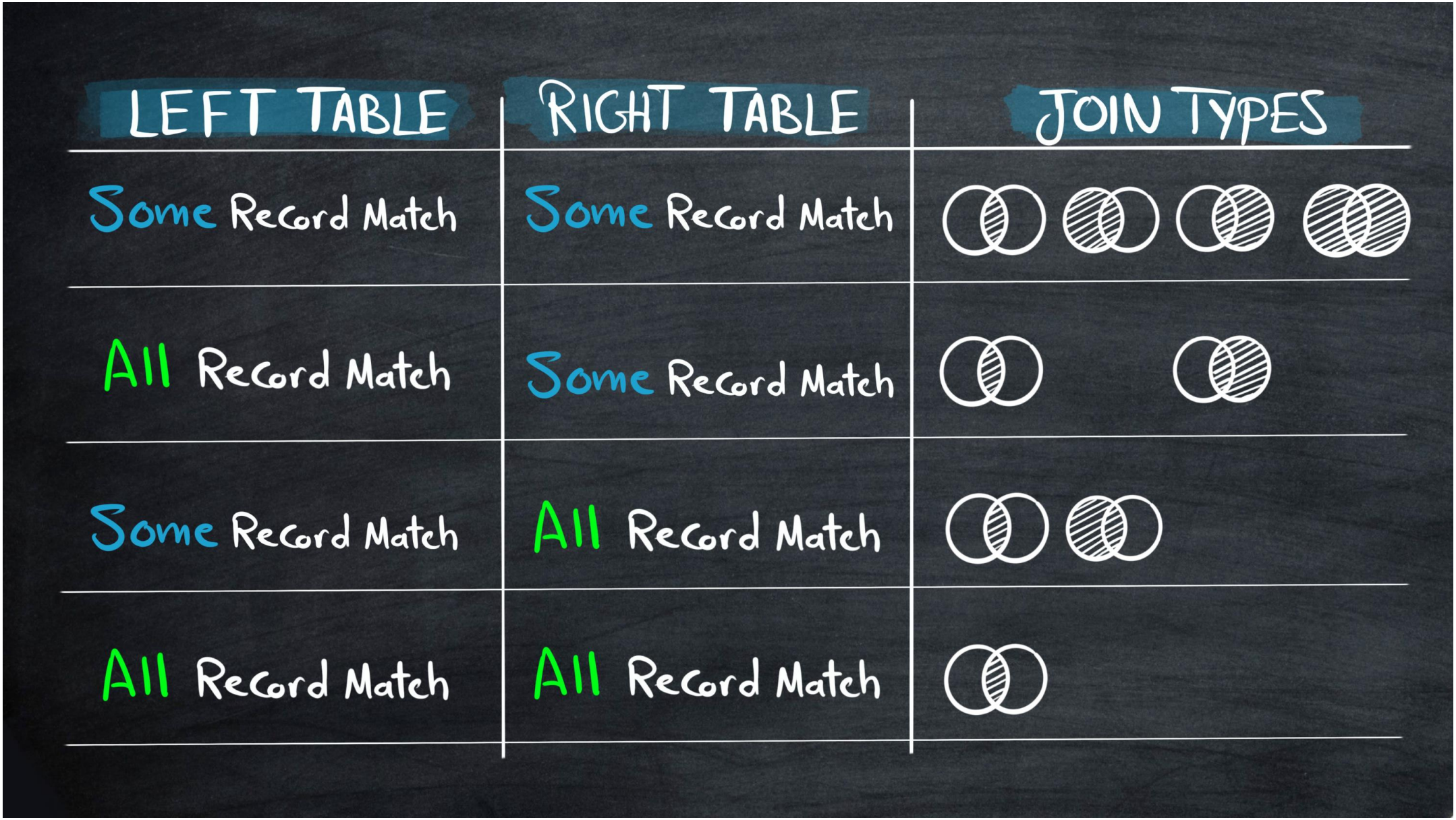


Relationships



Relationship | Referential Integrity

DATA WITH BARAA



Relationships | How it Works

Orders

CustomerID	Sales
1	50
2	20
2	10
1	30

Customers

CustomerID	Name
1	Maria
2	John
3	Georg

MANY-MANY

CustomerID	Sum(Sales)	Name
1	80	Maria
2	30	John

MANY-ONE

CustomerID	Sum(Sales)	Name
1	80	Maria
2	30	John

ONE-MANY

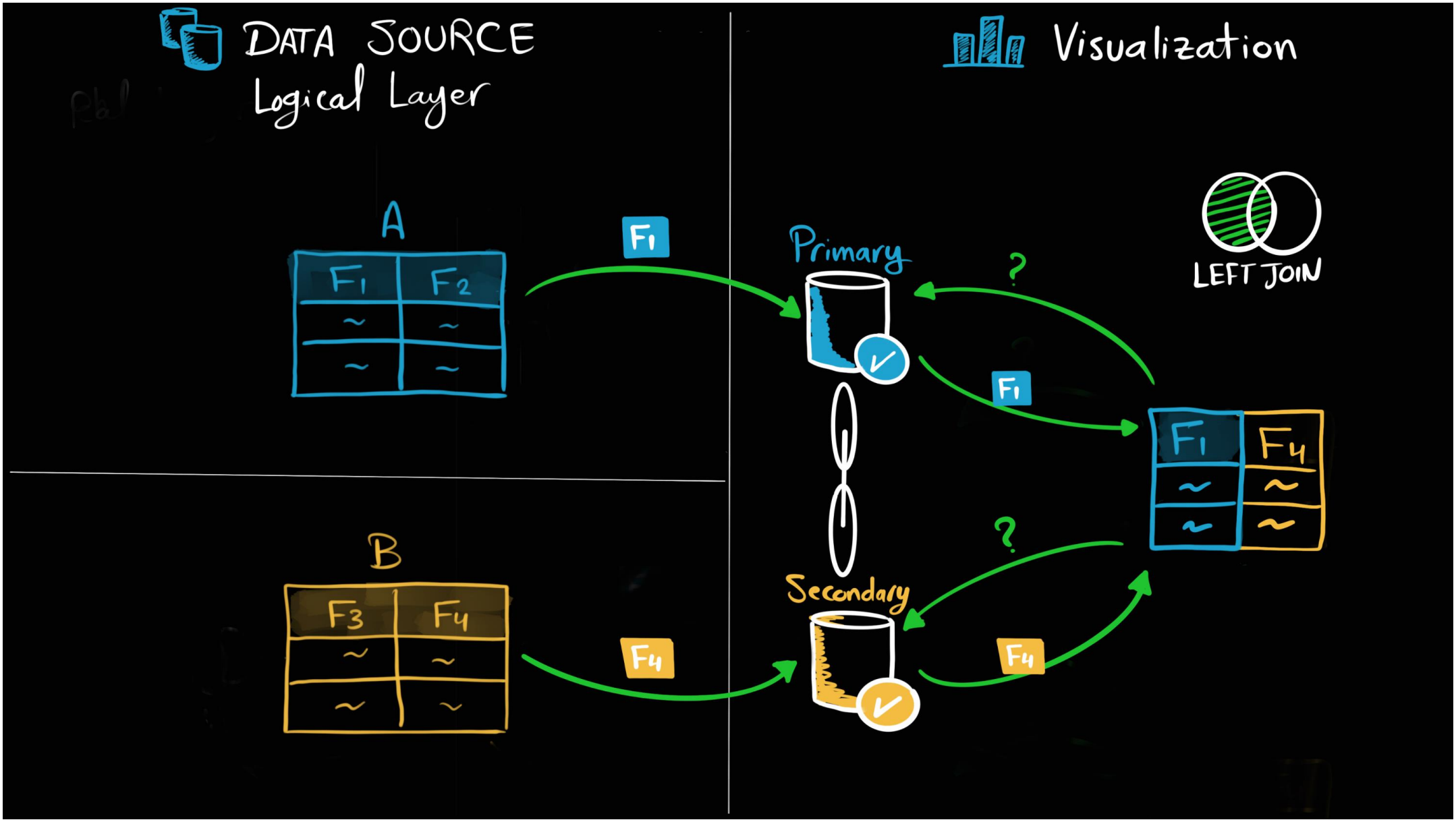
CustomerID	Sum(Sales)	Name
1	50	Maria
2	20	John

ONE-ONE

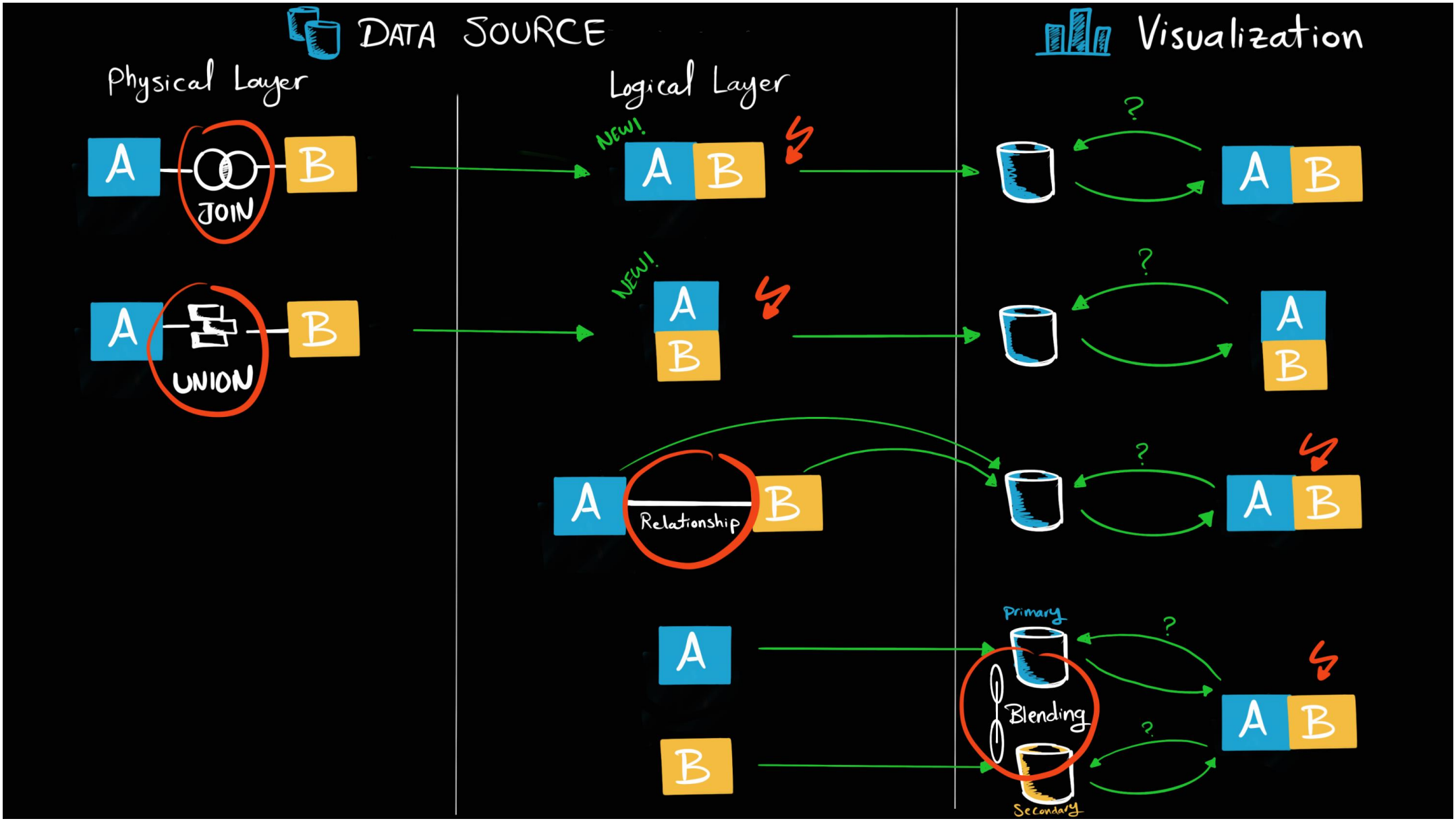
CustomerID	Sum(Sales)	Name
1	50	Maria
2	20	John

Correctness	Performance	Cardinaltiy	
OK	NOK	MANY	MANY
OK	OK	MANY	ONE
NOK	NOK	ONE	MANY
NOK	OK	ONE	ONE

Data Blending



Summary | Combine Methods



Summary | Combine Methods

	UNION	JOINS	RELATIONSHIP	BLENDING
Layer	Physical Layer	Physical Layer	Logical Layer	Visualization Level
Multi-Data Sources	✗	✗	✗	✓
Merge Tables?	✓	✓	✗	✗
Flexibility	Static	Static	Flexible	Very Flexible (Page by Page)
Join Types	n/a	Inner, Left, Right, Full	All	Left
Rank	n/a	3	1 (Default)	2