



# What are Databases?

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# WE NEED TO SAVE INFO...

– Maybe files?

02



# WE NEED TO SAVE INFO...

- Maybe files?
- Too big and hard to retrieve and modify data

03



# WE NEED TO SAVE INFO...

- Maybe tables?
- Then we will have organized collection of structured information

04



# SO DATABASES ARE...

- organized collection of structured information, or data, typically stored electronically in a computer system.

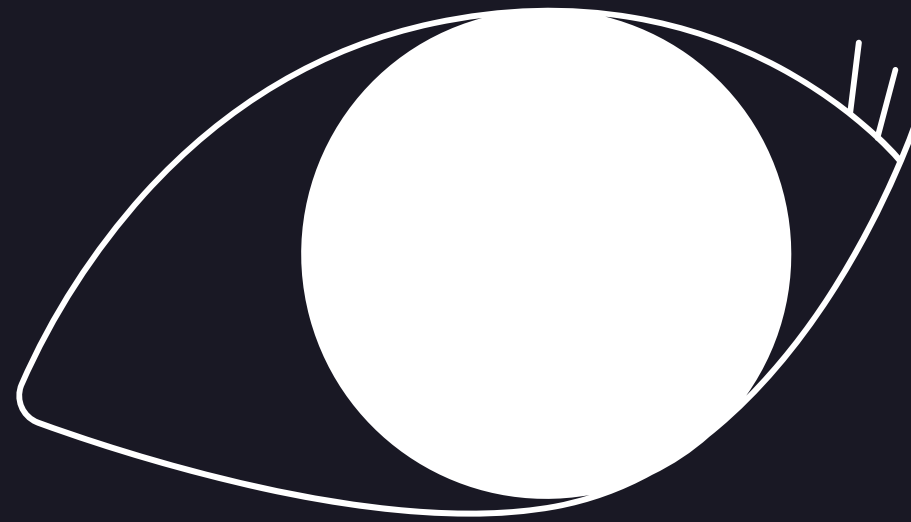
A database is usually controlled by a database management system (DBMS).

Together, the data and the DBMS, along with the applications that are associated with them, are referred to as a database system, often shortened to just database



# Tables and columns

	employeeNumber	lastName	firstName	extension	email	officeCode	reportsTo	jobTitle
▶	1002	Murphy	Diane	x5800	dmurphy@classicmodelcars.com	1	NULL	President
	1056	Patterson	Mary	x4611	mpatterso@classicmodelcars.com	1	1002	VP Sales
	1076	Firelli	Jeff	x9273	jfirelli@classicmodelcars.com	1	1002	VP Marketing
	1088	Patterson	William	x4871	wpatterson@classicmodelcars.com	6	1056	Sales Manager (APAC)
	1102	Bondur	Gerard	x5408	gbondur@classicmodelcars.com	4	1056	Sale Manager (EMEA)
	1143	Bow	Anthony	x5428	abow@classicmodelcars.com	1	1056	Sales Manager (NA)
	1165	Jennings	Leslie	x3291	ljennings@classicmodelcars.com	1	1143	Sales Rep
	1166	Thompson	Leslie	x4065	lthompson@classicmodelcars.com	1	1143	Sales Rep
	1188	Firelli	Julie	x2173	jfirelli@classicmodelcars.com	2	1143	Sales Rep
	1216	Patterson	Steve	x4334	spatterson@classicmodelcars.com	2	1143	Sales Rep
	1286	Tseng	Foon Yue	x2248	ftseng@classicmodelcars.com	3	1143	Sales Rep
	1323	Vanauf	George	x4102	gvanauf@classicmodelcars.com	3	1143	Sales Rep
	1337	Bondur	Loui	x6493	lbondur@classicmodelcars.com	4	1102	Sales Rep
	1370	Hernandez	Gerard	x2028	ghernandez@classicmodelcars.com	4	1102	Sales Rep
	1401	Castillo	Pamela	x2759	pcastillo@classicmodelcars.com	4	1102	Sales Rep
	1501	Rott	Larry	x2311	lrott@classicmodelcars.com	7	1102	Sales Rep



STOP! BUT THIS IS MY GOOGLE  
SPREADSHEET 

# DB'S VS SPREADSHEETS

08

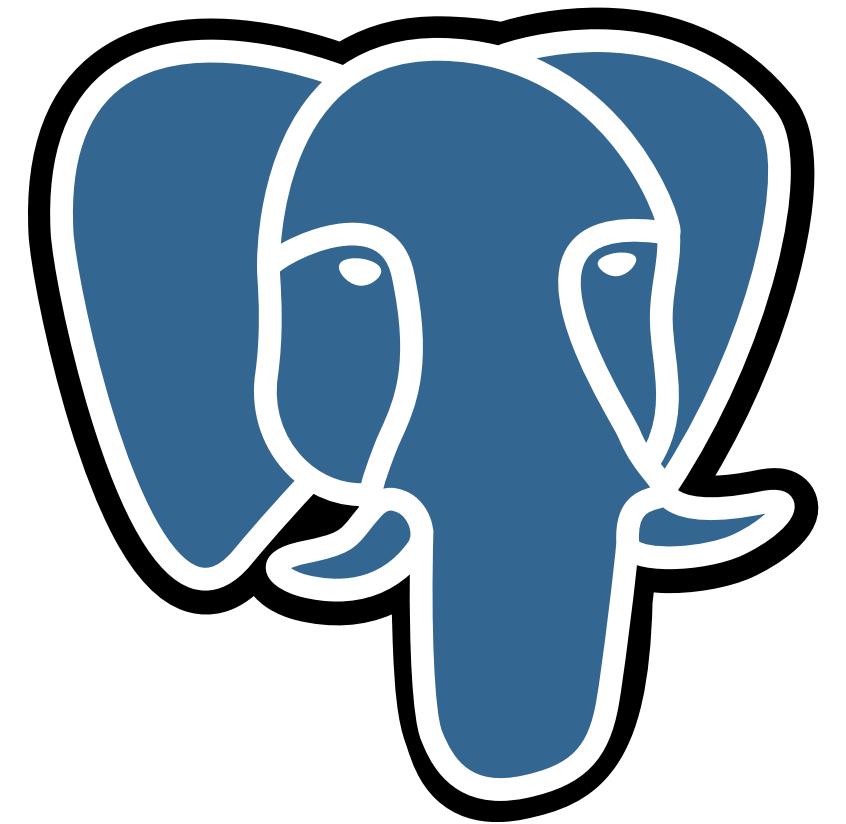
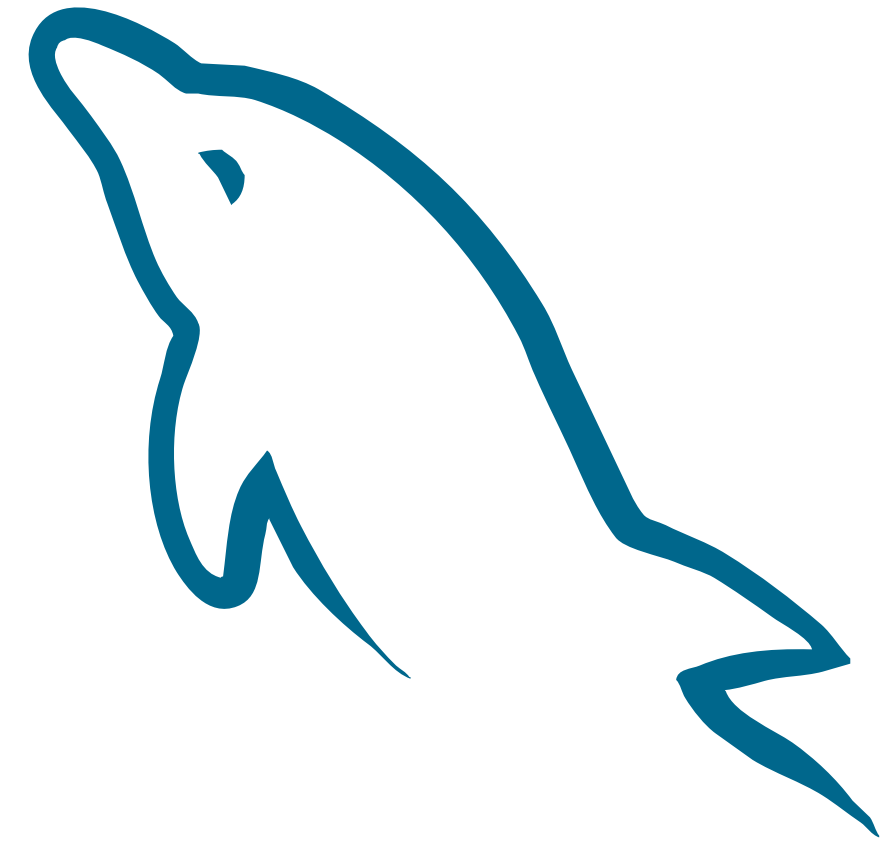
- Strict data writing and updating via data types
- Multiple updates at a time
- More solid foundation
- range of complexity in terms of data manipulation via SQL



# STRUCTURED QUERY LANGUAGE (SQL)

– is a programming language used by nearly all relational databases to query, manipulate, and define data, and to provide access control

09



# DATABASE TYPES AND DIFFERENCES

10

- Relational databases  
PostgreSQL, MySQL
- NoSQL  
MongoDB, AWS Dynamo, Firebase Realtime / CloudStore
- Graph databases  
Amazon Neptune

# Tables

11

employeeNumb	lastName	firstName	ext
1002	Murphy	Diane	x58
1056	Patterson	Mary	x46
1076	Firelli	Jeff	x92
1088	Patterson	William	x48
1102	Bondur	Gerard	x54
1143	Bow	Anthony	x54
1165	Jennings	Leslie	x32
1166	Thompson	Leslie	x40
1188	Firelli	Julie	x21
1216	Patterson	Steve	x43
1286	Tseng	Foon Yue	x22
1323	Vanauf	George	x41
1337	Bondur	Loui	x64
1370	Hernandez	Gerard	x20
1401	Castillo	Pamela	x27
1501	Rott	Larry	x23

Tables everywhere

# Tables, Columns and Types

	employeeNumb	lastName	firstName	extension	email	officeCode	reportsTo	jobTitle
▶	1002	Murphy	Diane	x5800	dmurphy@classicmodelcars.com	1	NULL	President
	1056	Patterson	Mary	x4611	mpatterso@classicmodelcars.com	1	1002	VP Sales
	1076	Firelli	Jeff	x9273	jfirelli@classicmodelcars.com	1	1002	VP Marketing
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# Connections within Tables

## One-to-one / Primary key

Students table

Student ID	12345
Last Name	Tang
First Name	Sophie

Contact Info table

Student ID	12345
City	New York
Phone	408-555-3456

# Connections within Tables

## One-to-many

Customers table

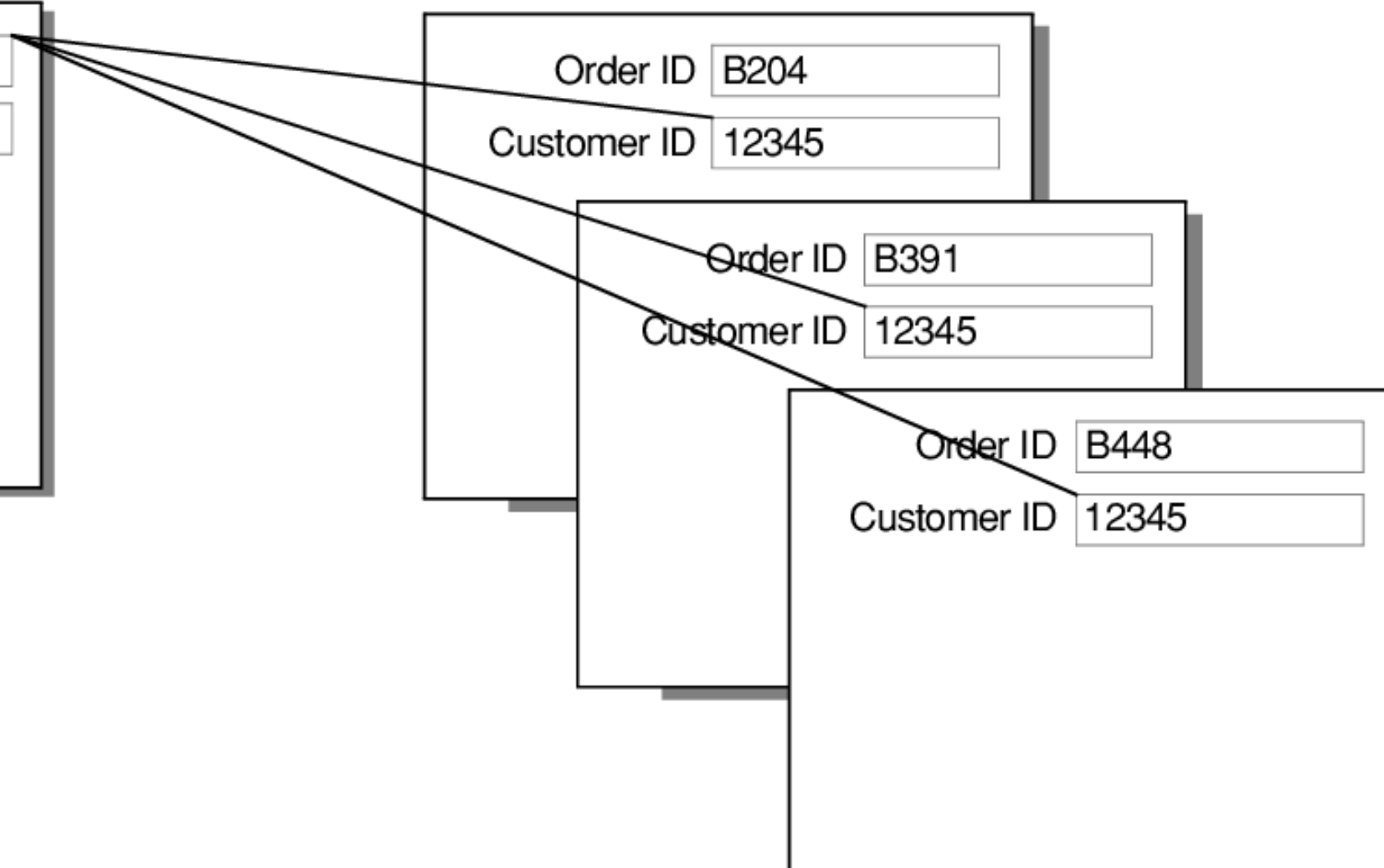
Customer ID	12345
Name	Tang

Orders table

Order ID	B204
Customer ID	12345

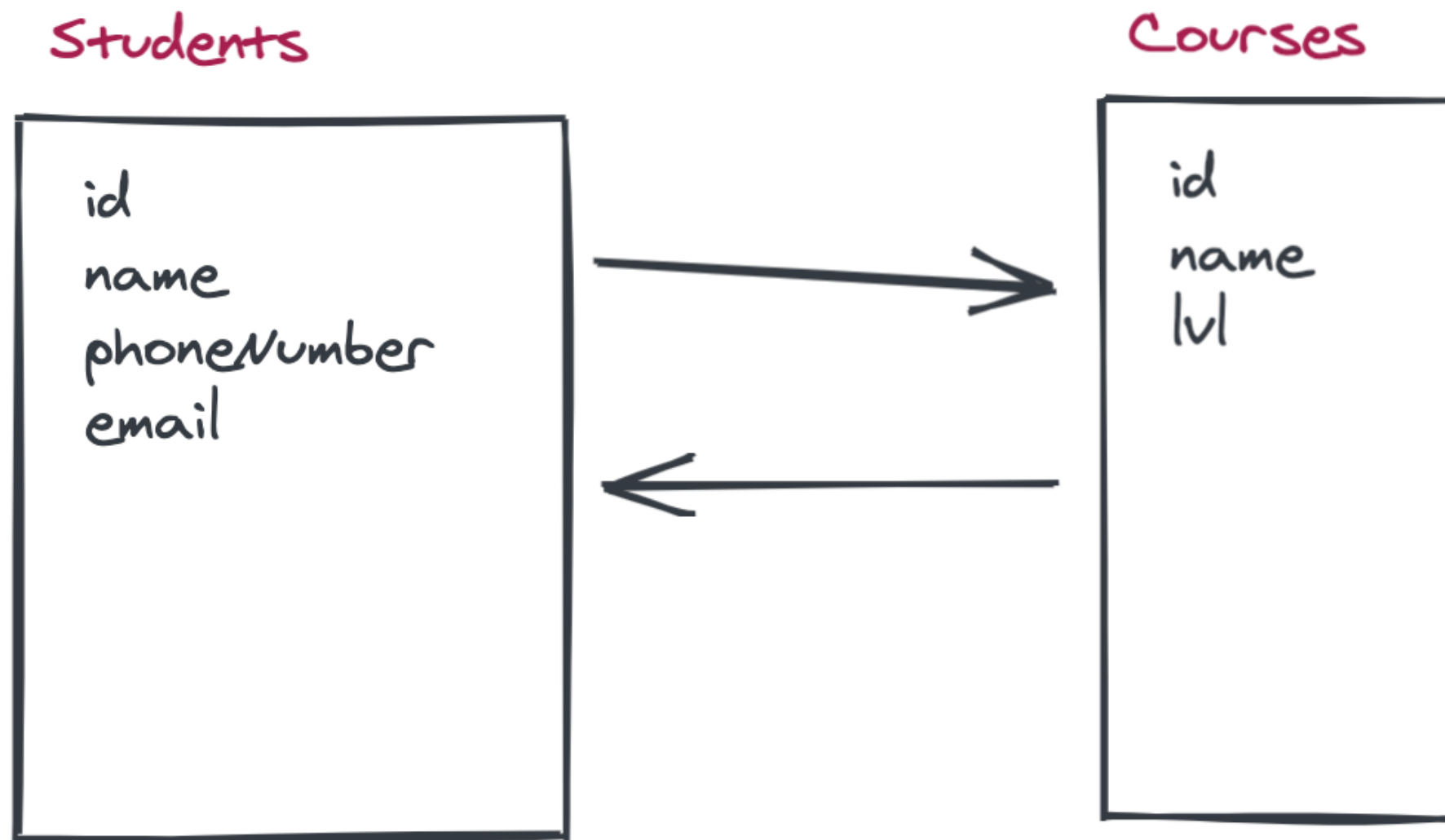
Order ID	B391
Customer ID	12345

Order ID	B448
Customer ID	12345



# Connections within Tables

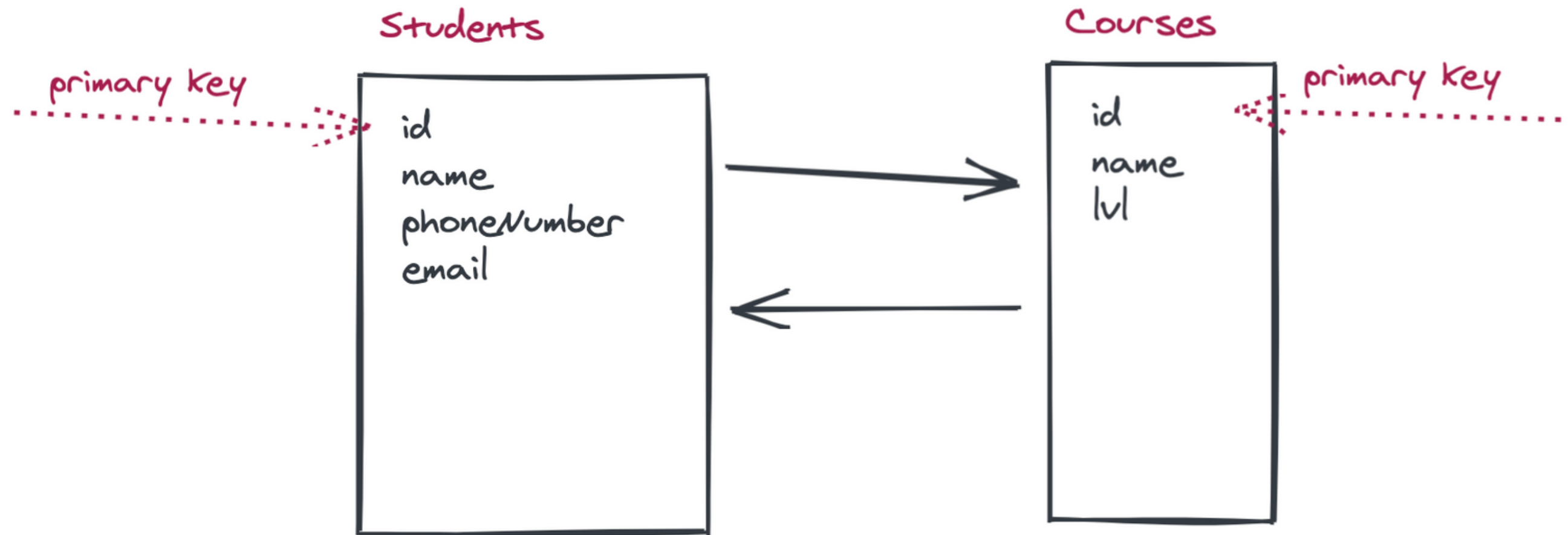
## Many-to-many





# Connections within Tables

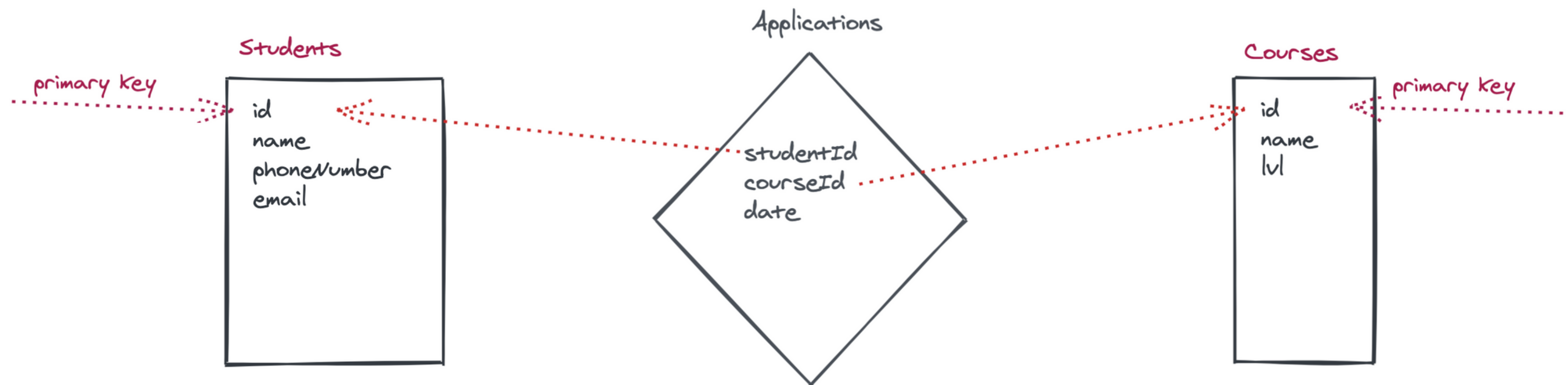
Many-to-many: Primary key





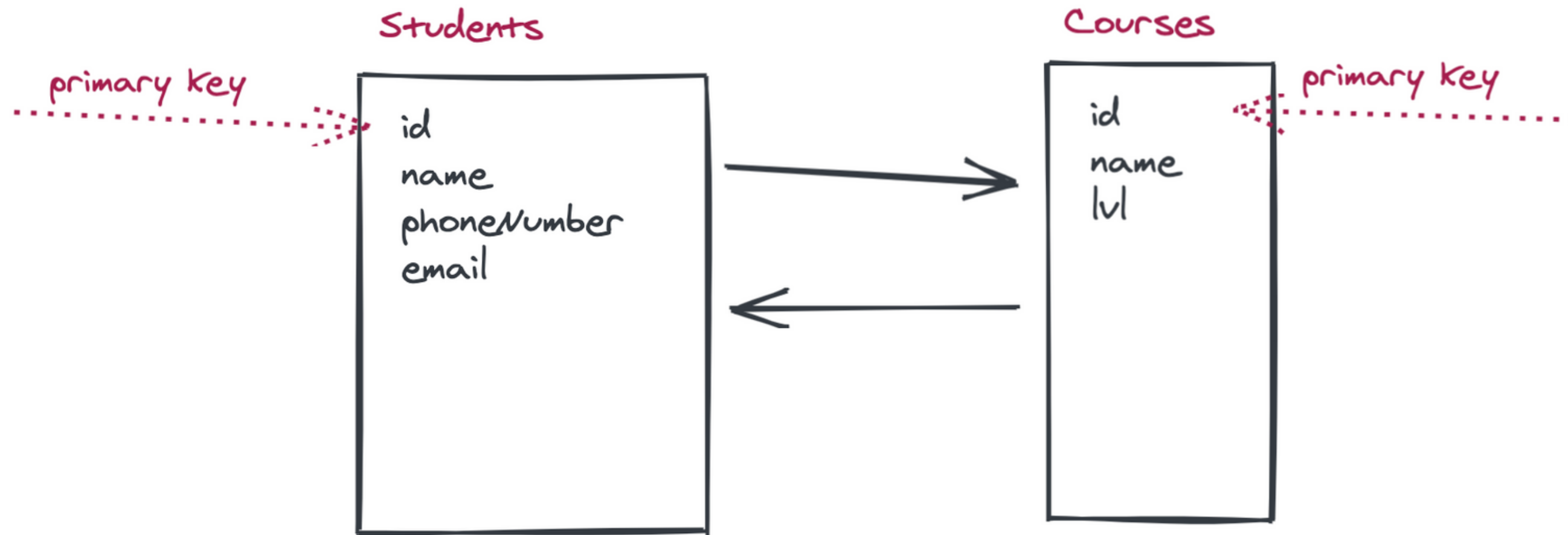
# Connections within Tables

## Many-to-many: Junction Table



# Connections within Tables

## Many-to-many





THE TALK IS CHEAP,  
SHOW ME THE CODE.  
(LINUS TORVALDS)

Create Database

One-to-One

One-to-Many

Many-to-Many

**I've made mistakes  
but I'm not going to make  
the same mistakes.  
I'll make new mistakes**

JOSE MOURINHO

# QUESTIONS?

## LET'S STAY CONNECTED

@vre2h at [FB](#), [Linkedin](#),  
[Telegram](#)

## BLOG

[oganisyan.com](https://oganisyan.com)

SCAN ME

