# RELATIONAL DATABASES

### INTRODUCTION

A relational database uses tables with rows and columns to store information, like a spreadsheet. The key advantage of relational databases is the ability to spread information across multiple tables, reducing duplication and allowing for complex data relationships and flexible data manipulation.

## CORE CONCEPTS

## → TABLE

### DEFINITION

A table is a collection of columns (metadata) and rows (data). Each table stores information about a specific subject.

### SHORTCOMINGS OF A SINGLE TABLE APPROACH

- Redundancy: Repeated data entries, such as city names and countries.
- Scalability Issues: Adding new columns for each year or dataset can complicate data retrieval and calculations.

## → PRIMARY KEY (PK)

### DEFINITION

A primary key is a unique identifier for each row in a table, often an auto-generated number. It ensures each record can be uniquely identified.

## → FOREIGN KEY (FK)

### DEFINITION

A foreign key is a column in one table that references the primary key in another table, creating a relationship between the two tables. It ensures referential integrity.

# SQL BASICS

## SQL (Structured Query Language)

A standard language for querying and modifying data in a relational database.

- **SELECT:** Retrieves data from a table.
- **WHERE:** Filters data based on a condition.
- **JOINING DATA:  INNER JOIN:** Combines rows from two or more tables based on a related column between them.