Introduction to Database and SQL

Database

> A structured collection of data stored in a way that makes it easy to manage, access, and update the data

orders.csv

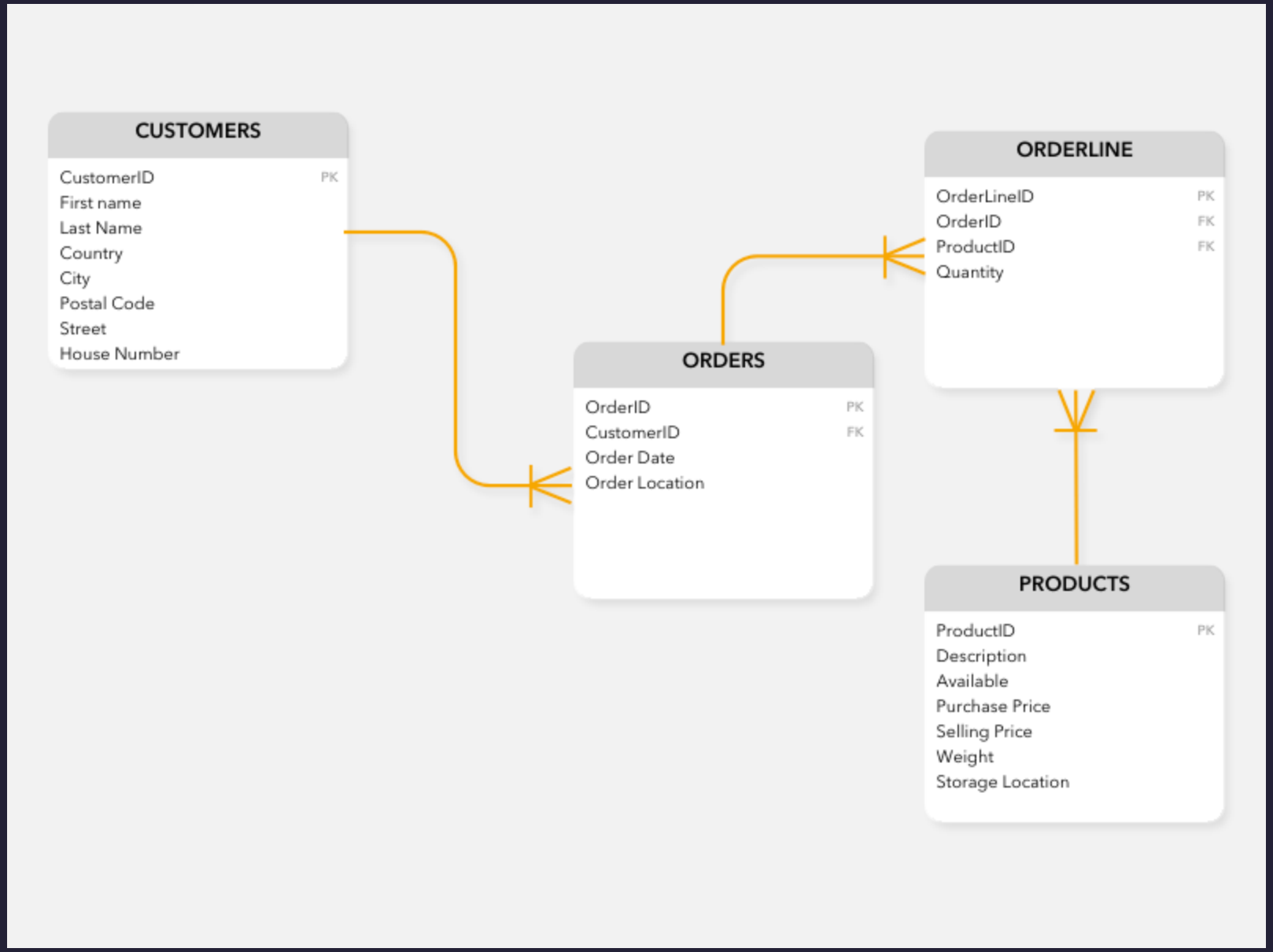
No.	External ID	Label	Shipping Method	First Name	Last Name	Email	Phone	Country	Reg
1	873	873	1	Emma	Roberts	customer@example.com	2124567890	US	Cal
2	874	874	1	Laura	Moss	customer@example.com	2124567891	US	Cal
3	875	875	1	John	Smith	customer@example.com	2124567892	US	Flo
4	876	876	1	Matthew	Miller	customer@example.com	2124567893	US	Wy
5	877	877	1	Rachel	Briggs	customer@example.com	2124567894	US	Tex
6	878	878	1	John	Green	customer@example.com	2124567895	US	Nev
7	879	879	1	Jim	Barnes	customer@example.com	2124567896	US	Cal
8	880	880	1	Erica	Jones	customer@example.com	2124567897	US	Ariz
9	881	881	1	Ashley	White	customer@example.com	2124567898	US	Cal
10	882	882	1	David	Garcia	customer@example.com	2124567899	US	Flo

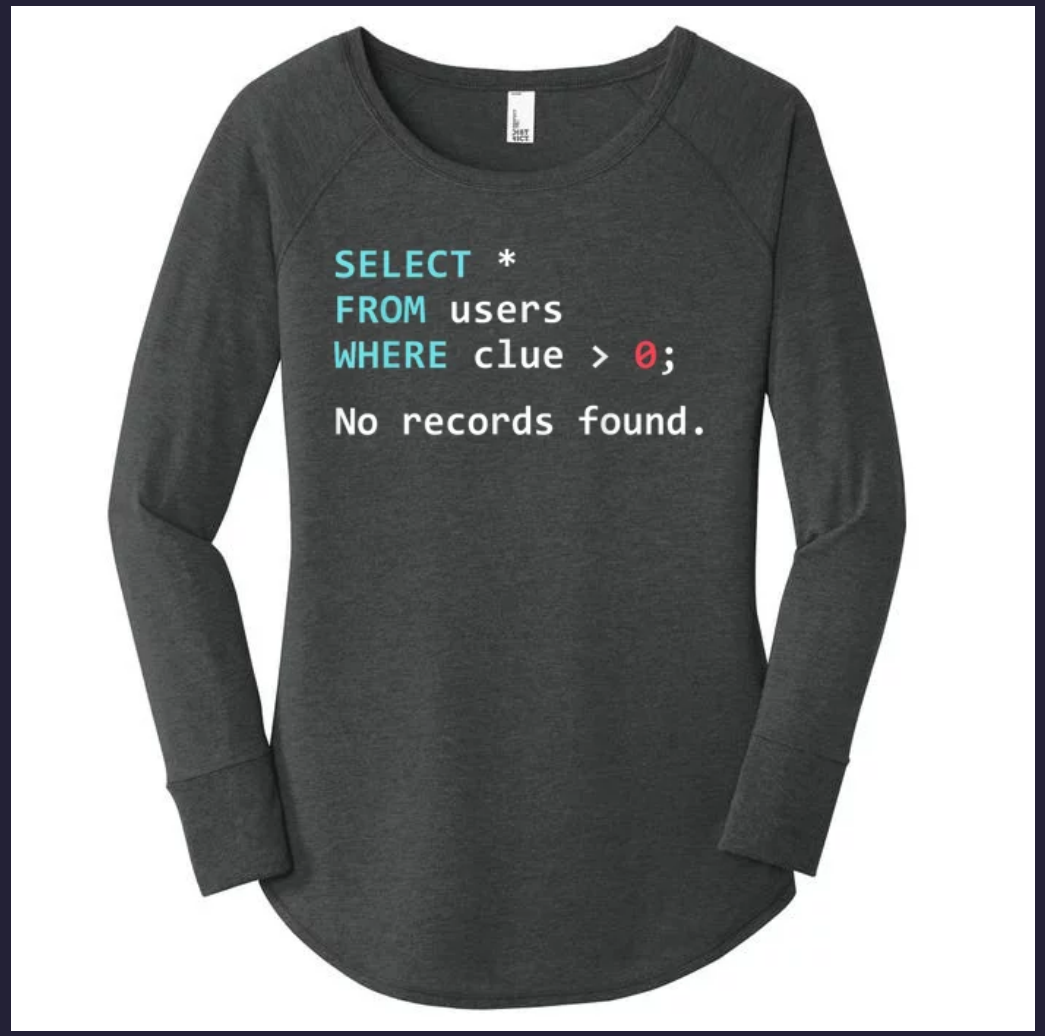
Why Databases?

- Scalability
- Data integrity
- Data security
- Data retrieval and analysis

Entity Relationship Diagram (ERD)

- Blueprint of a database
- How “entities” such as people, objects or concepts relate to each other within a system
  - Entity: A thing that can have data stored about it (Nouns)
  - Relationship: How entities are associated with each other (Verbs)

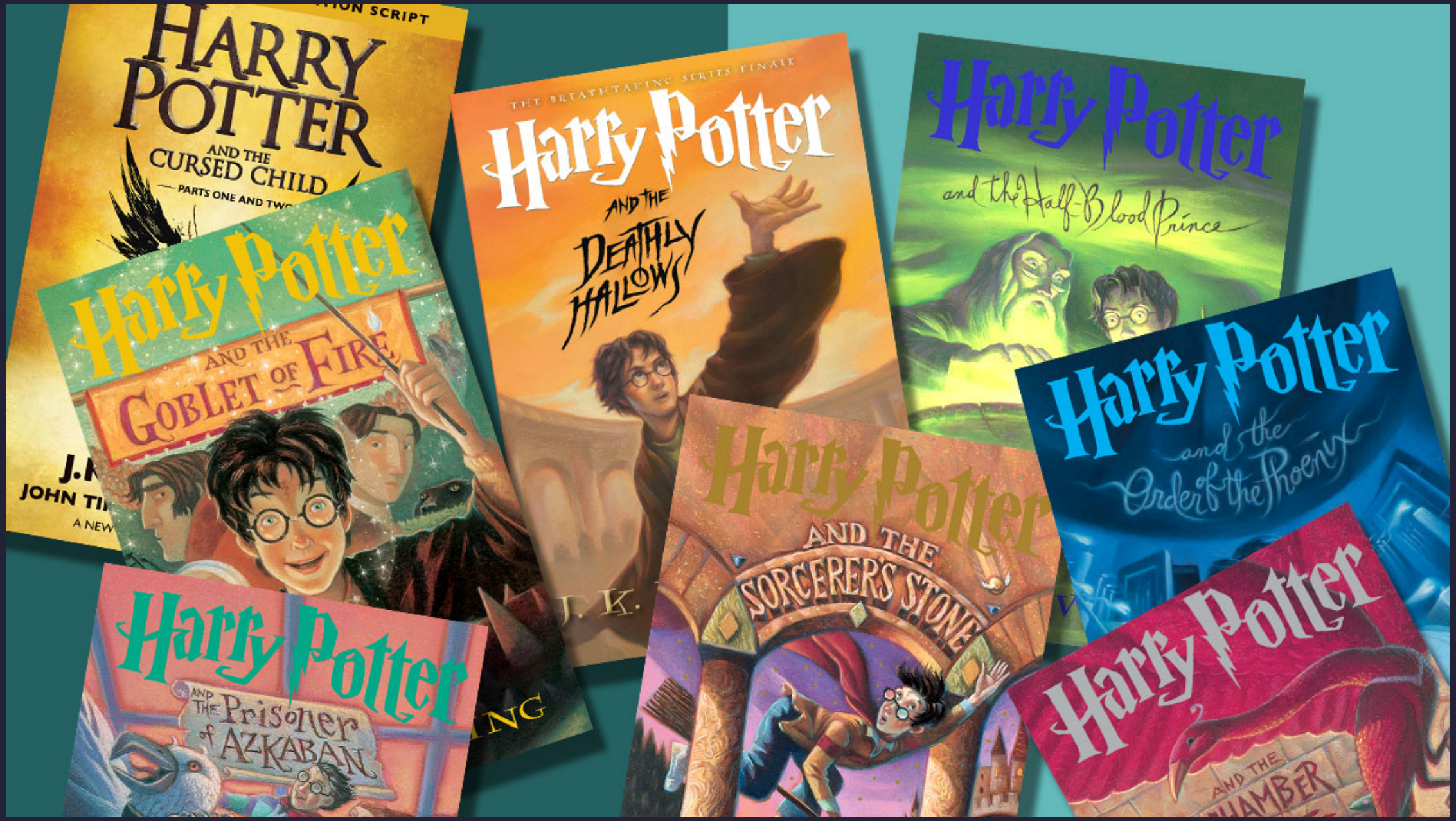

CUSTOMERS
CustomerID PK
First name
Last Name
Country
City
Postal Code
Street
House Number
ORDERLINE
OrderLineID PK
OrderID FK
ProductID FK
Quantity
ORDERS
OrderID PK
CustomerID FK
Order Date
Order Location
PRODUCTS
ProductID PK
Description
Available
Purchase Price
Selling Price
Weight
Storage Location



Structured Query Language (SQL)

SELECT [ALL/DISTINCT] column_list
FROM table_list
[**WHERE** conditional expression]
[**GROUP BY** group_by_column_list]
[**HAVING** conditional expression]
[**ORDER BY** order_by_column_list]

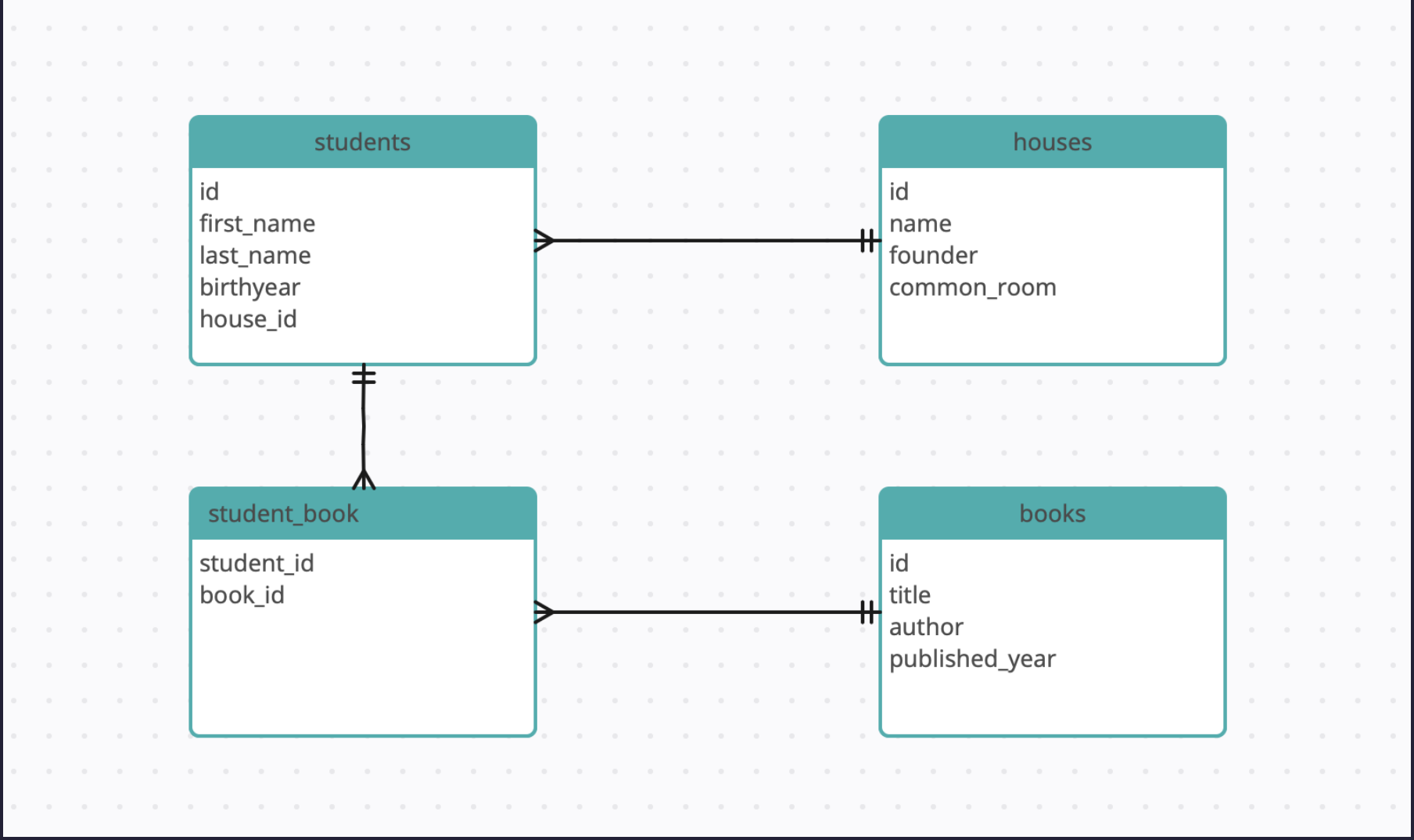
Essentials of Database Management, 1st ed., Pearson.


HARRY POTTER
AND THE CURSED CHILD
PARTS ONE AND TWO
Harry Potter
AND THE GOBLET OF FIRE
Harry Potter
THE BREATHTAKING SERIES FINALE
AND THE DEATHLY HALLOWS
J. K.
Harry Potter
and the Half-Blood Prince
Harry Potter
and the Order of the Phoenix
Harry Potter
AND THE SORCERER'S STONE
Harry Potter
AND THE Prisoner of AZKABAN
Harry Potter
AND THE

1. What do you want to store data about?

2. How are they related to each other?

Harry Potter Database - ERD



`SELECT` columns `FROM` a table

SELECT `column_name` FROM `table_name`

```
SELECT first_name FROM students;
SELECT first_name, last_name FROM students;
SELECT * FROM students;
```

`LIMIT` the number of records returned

SELECT `column_name` FROM `table_name` LIMIT `number`

```
SELECT * FROM students LIMIT 10;
```

`--` is used to add comments in SQL

`;` is used to indicate the end of a SQL statement

`SELECT` columns `FROM` a table `WHERE` conditions are true

SELECT `column_name` FROM `table_name` WHERE `condition`

```sql
-- select all students with house_id = 1
SELECT first_name, last_name FROM students WHERE house_id = 1;
-- select all students with birthyear = 1980
SELECT first_name, last_name FROM students WHERE birthyear = 1980;
-- select all students with birthyear >= 1980
SELECT first_name, last_name FROM students WHERE birthyear >= 1980;
```

💻 Harry Potter Database - SQL

1. What year was Harry Potter born?
2. What is the name of the student who was born in 1980?
3. Who is the founder of Gryffindor?
4. Who is the oldest student in Gryffindor?