Databases

INTRODUCTION TO SQL

Izzy Weber
Curriculum Manager, DataCamp

datacamp

Course goals

1. Understand databases and their structure → Chapter 1
2. Extract information from databases using SQL → Chapter 2

Introducing databases

patrons

card_num	name	member_year	total_fine
54378	Izzy	2012	9.86
94722	Maham	2020	0
45783	Jasmin	2022	2.05
90123	James	1989	0

books

id	title	author	genre	pub_year
638	Being Mortal	Atul Gawande	Non-Fiction	2015
912	Educated	Tara Westover	Non-Fiction	2018
322	Night	Elie Wiesel	Non-Fiction	1956
156	Where the Wild Things Are	Maurice Sendak	Childrens	1963

checkouts

id	start_date	due_date	card_num	book_id
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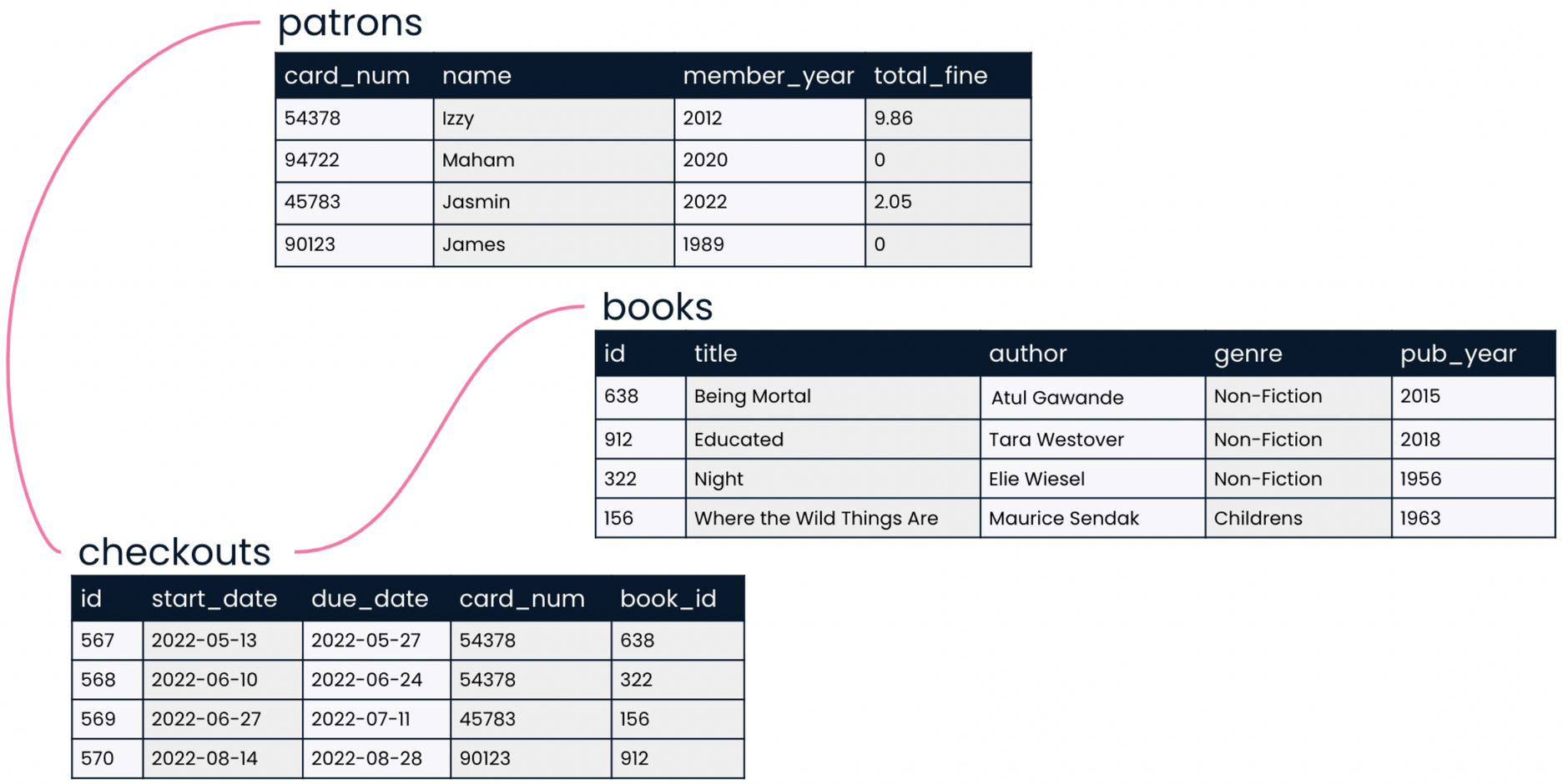
Relational databases

- Define relationships between tables of data inside the database



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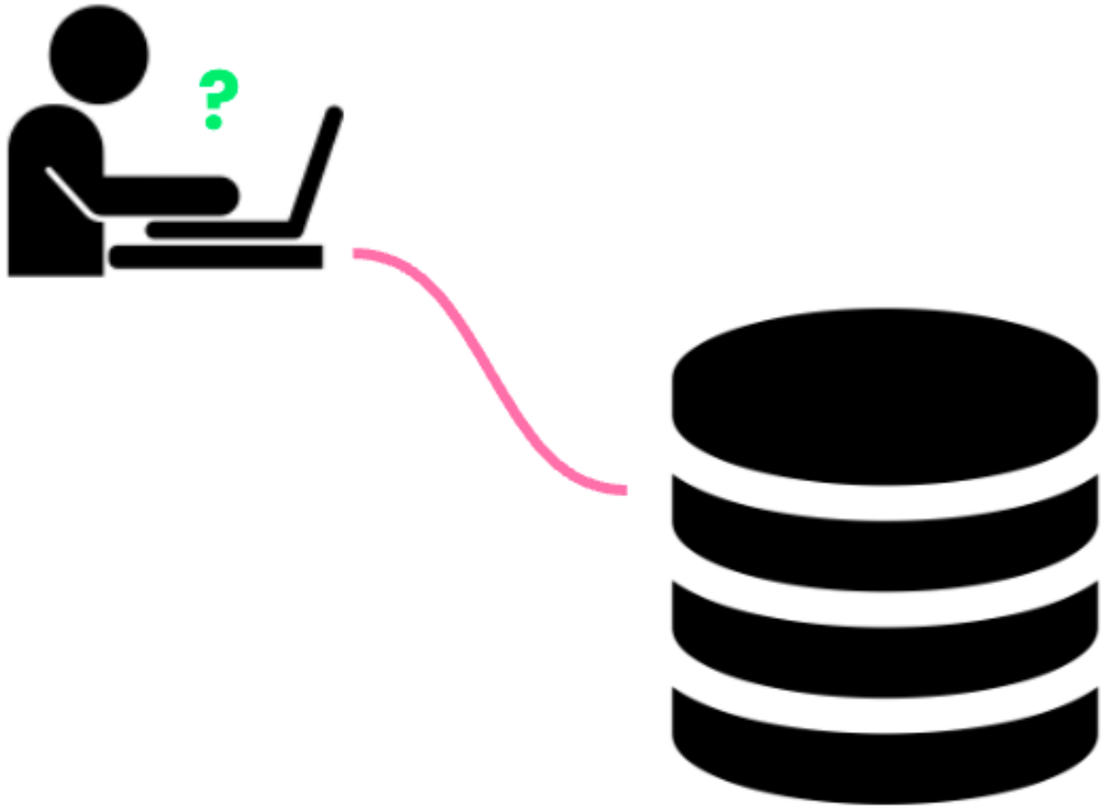
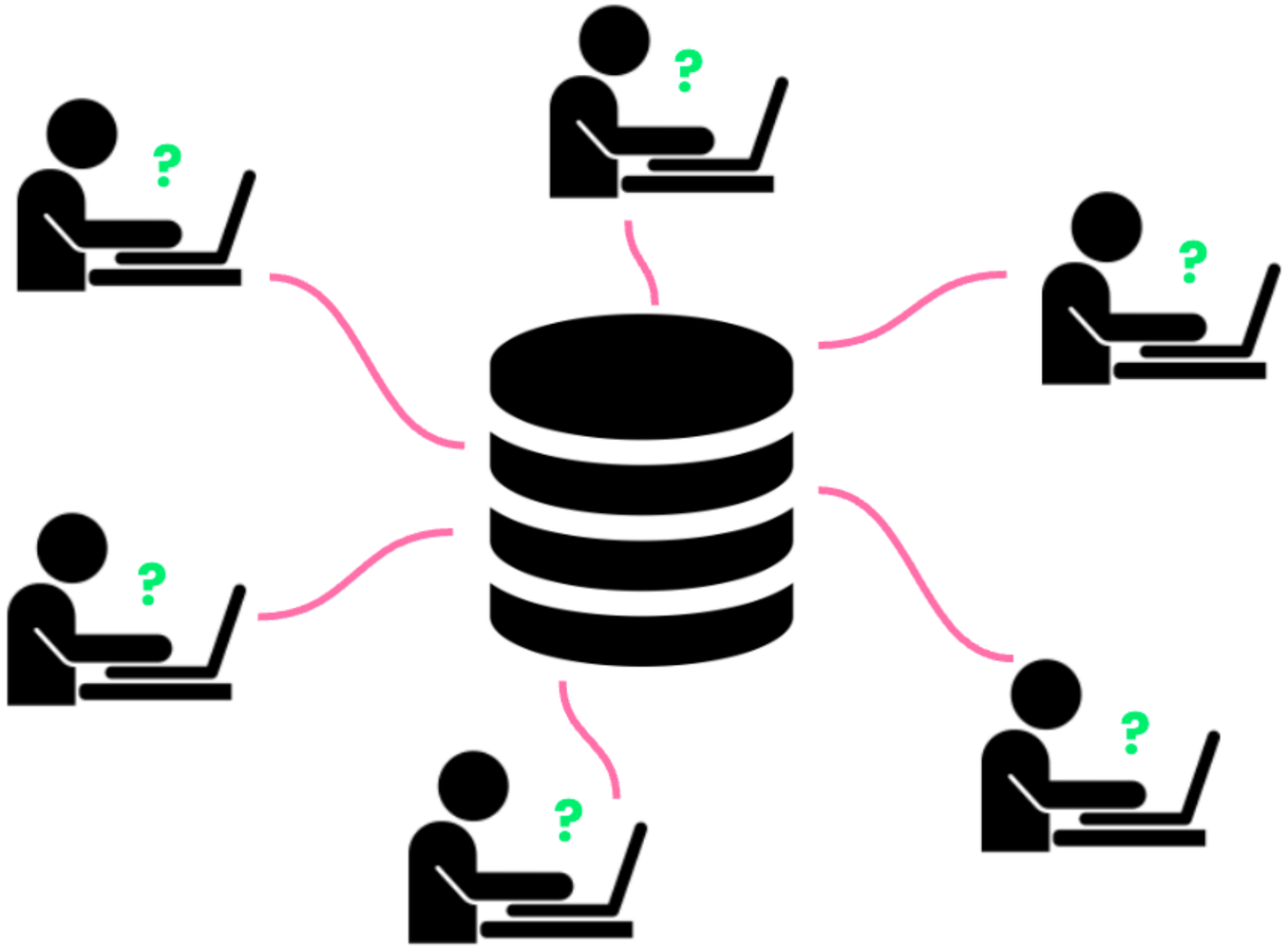
Database advantages

- More storage than spreadsheet applications
- Storage is more secure



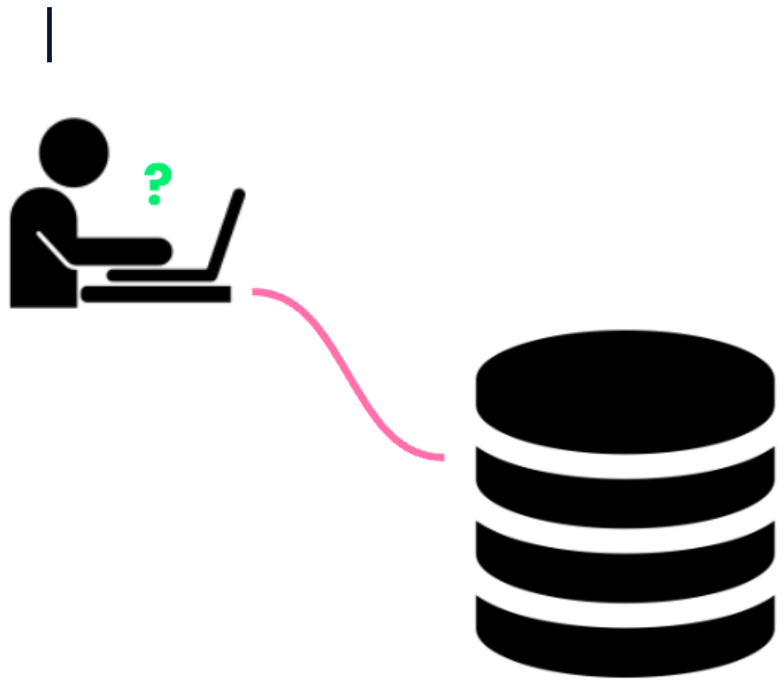
Database advantages



SQL

- Short for Structured Query Language
- The most widely used programming language for databases

```
SELECT *
FROM patrons
LIMIT 30
```



Let's practice!

INTRODUCTION TO SQL

Tables

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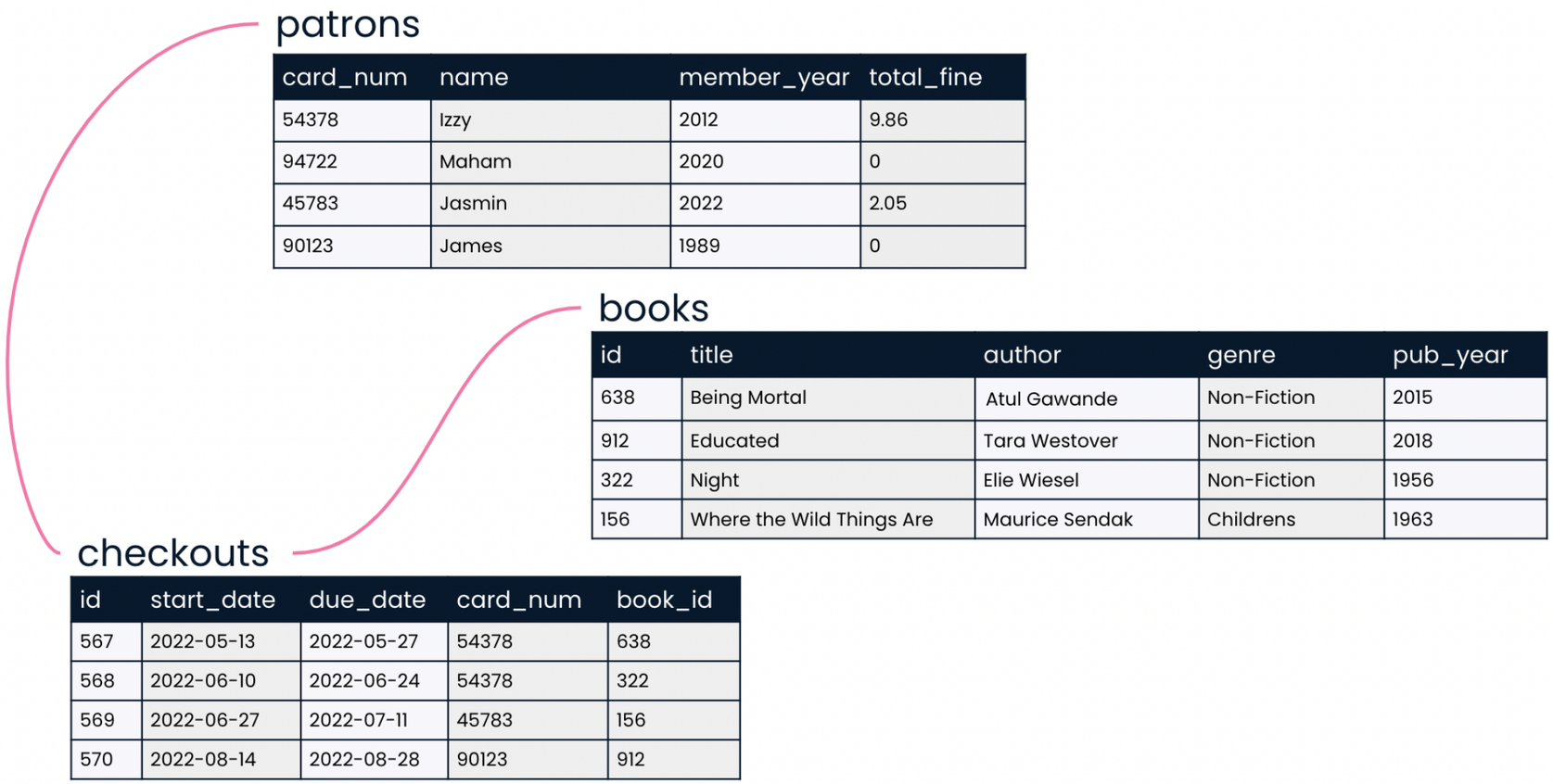
A seat at the table

- Table rows and columns are referred to as *records* and *fields*
- Fields are set at database creation; there is no limit to the number of records



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Good table manners

Table names should...

- be lowercase
- have no spaces—use underscores instead
- refer to a collective group or be plural

patrons

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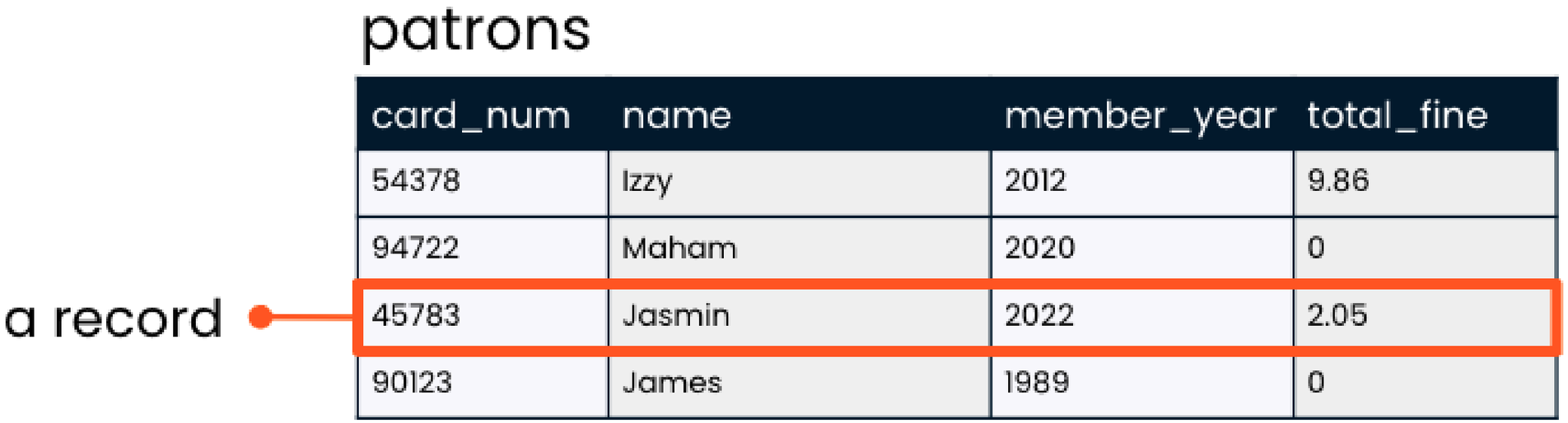
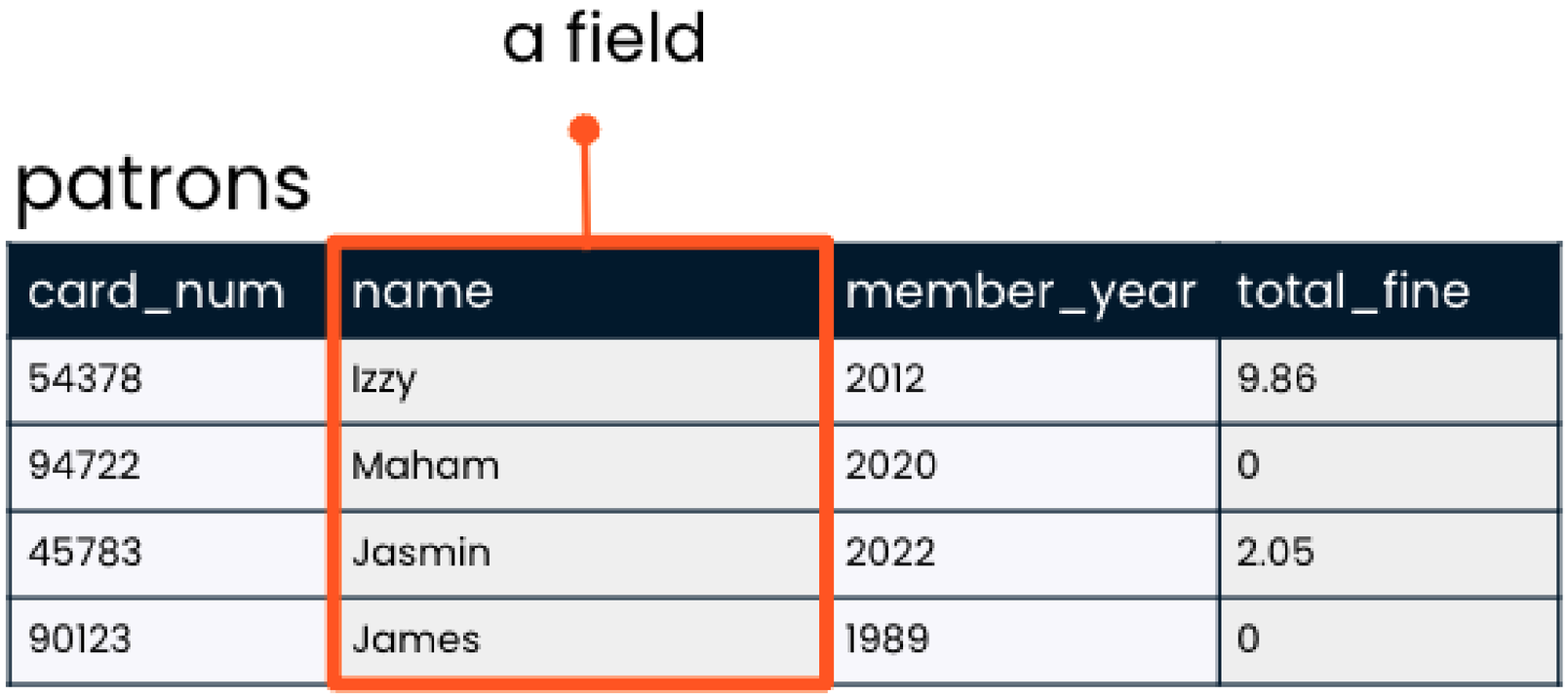
Laying the table: records

A record is a row that holds data on an individual observation



Laying the table: fields

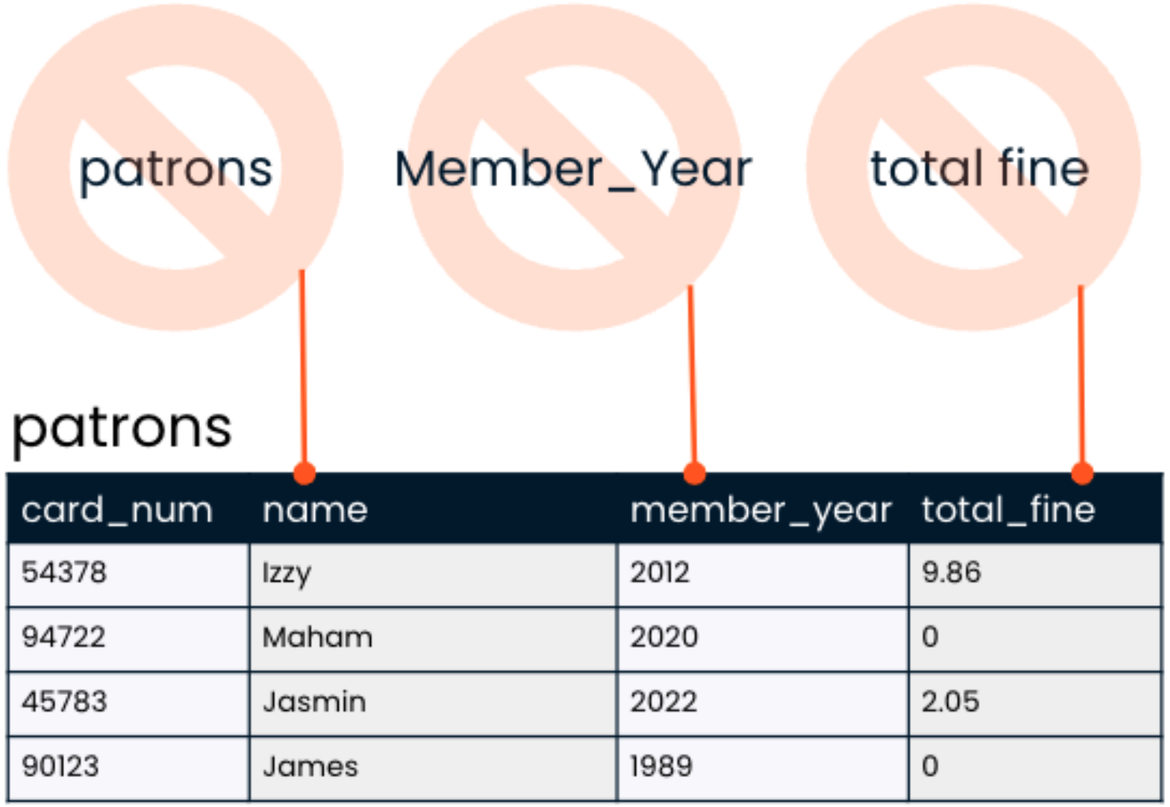
A field is a column that holds one piece of information about all records



More table manners

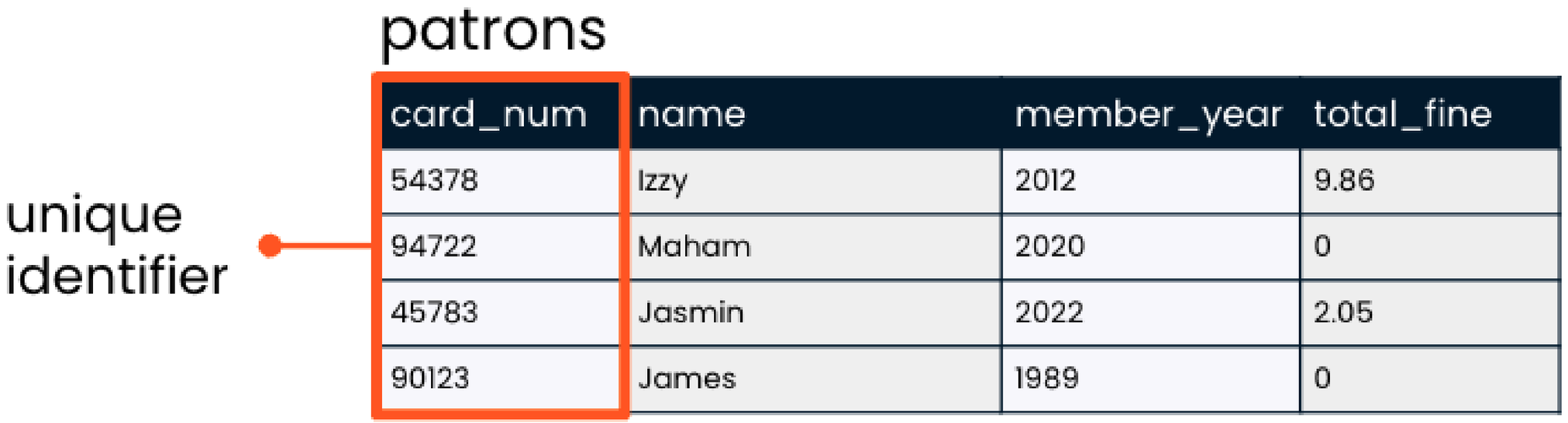
Field names should...

- be lowercase
- have no spaces
- be singular
- be different from other field names
- be different from the table name



Assigned seats

- *Unique identifiers* are used to identify records in a table
- They are unique and often numbers



The more the merrier

patrons

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patron_checkouts

card_num	name	member_year	total_fine	checkout_id	start_date	due_date	book_id
54378	Izzy	2012	9.86	567	2022-05-13	2022-05-27	638
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Data

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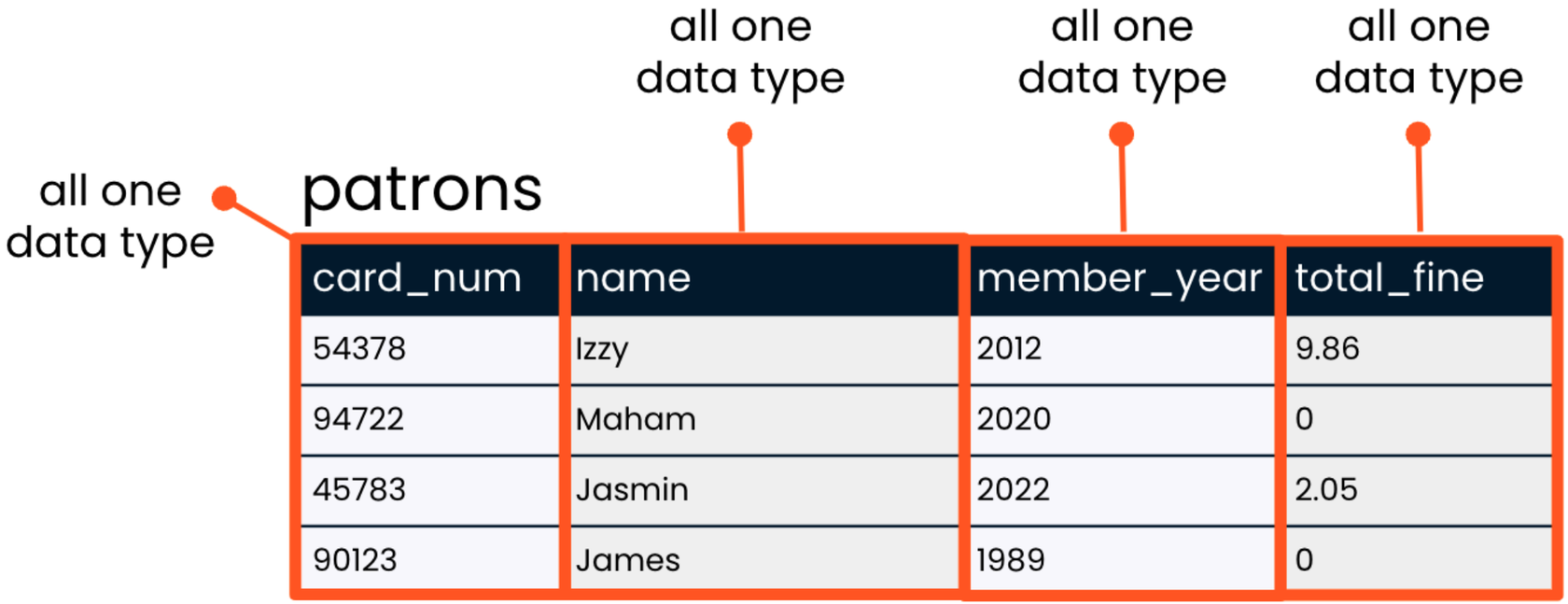
SQL data types



card_num	name	member_year	total_fine
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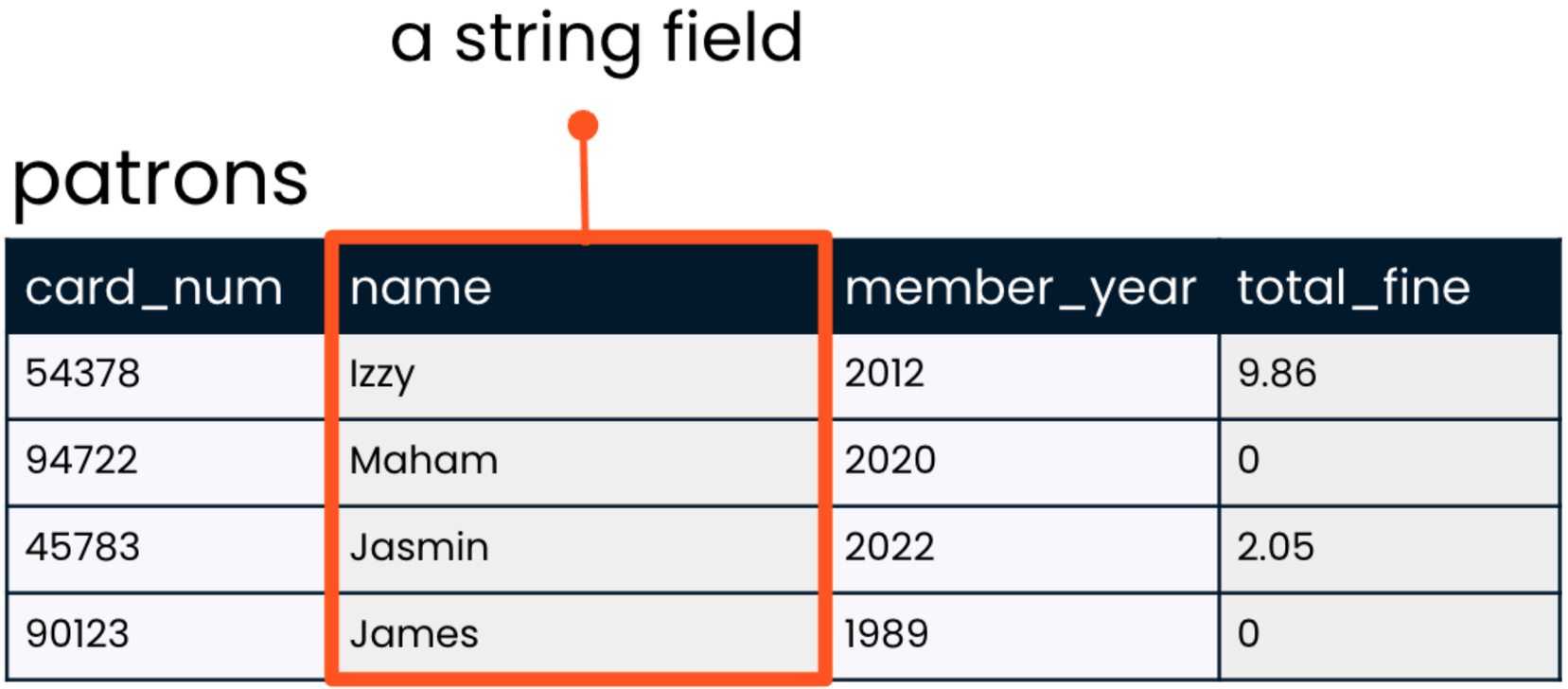
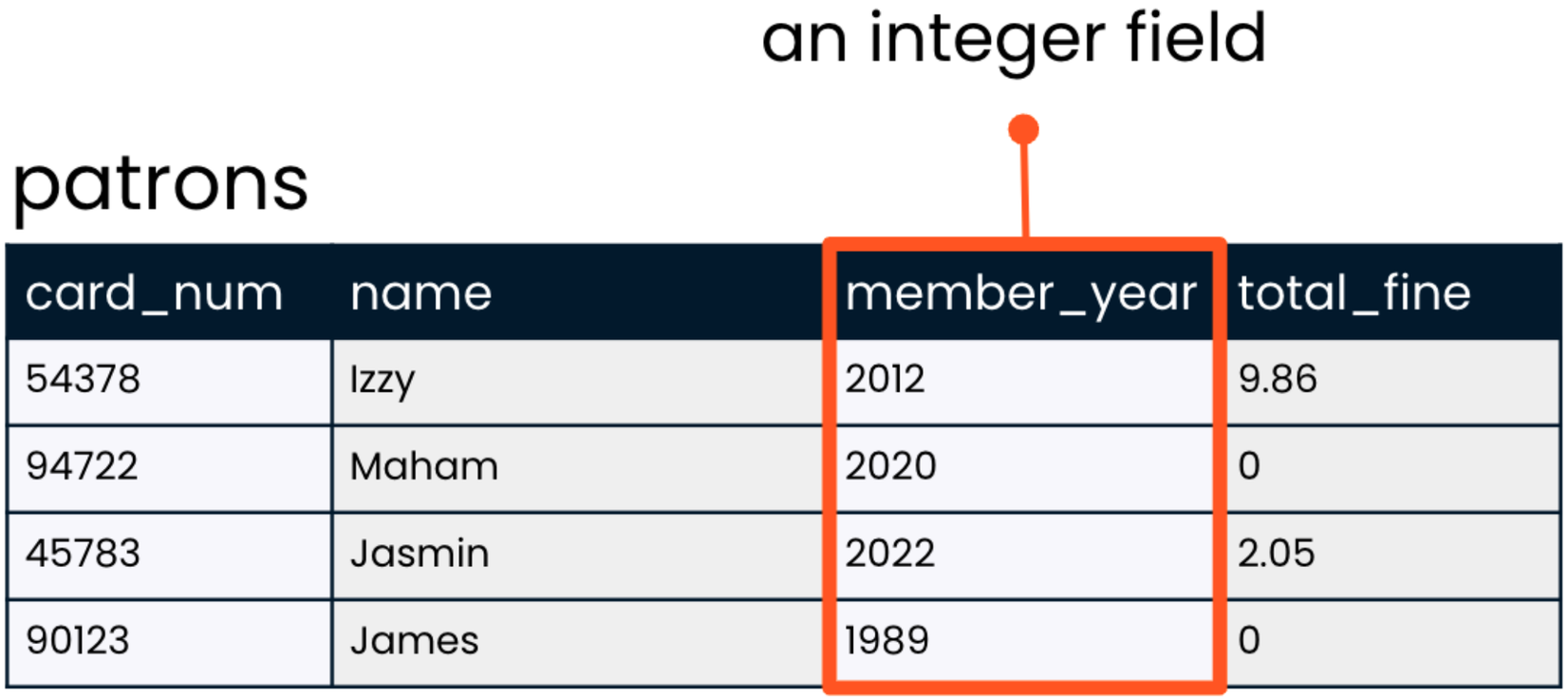
- Different types of data are stored differently and take up different space
- Some operations only apply to certain data types

Strings



- A string is a sequence of characters such as letters or punctuation
- `VARCHAR` is a flexible and popular string data type in SQL

Integers

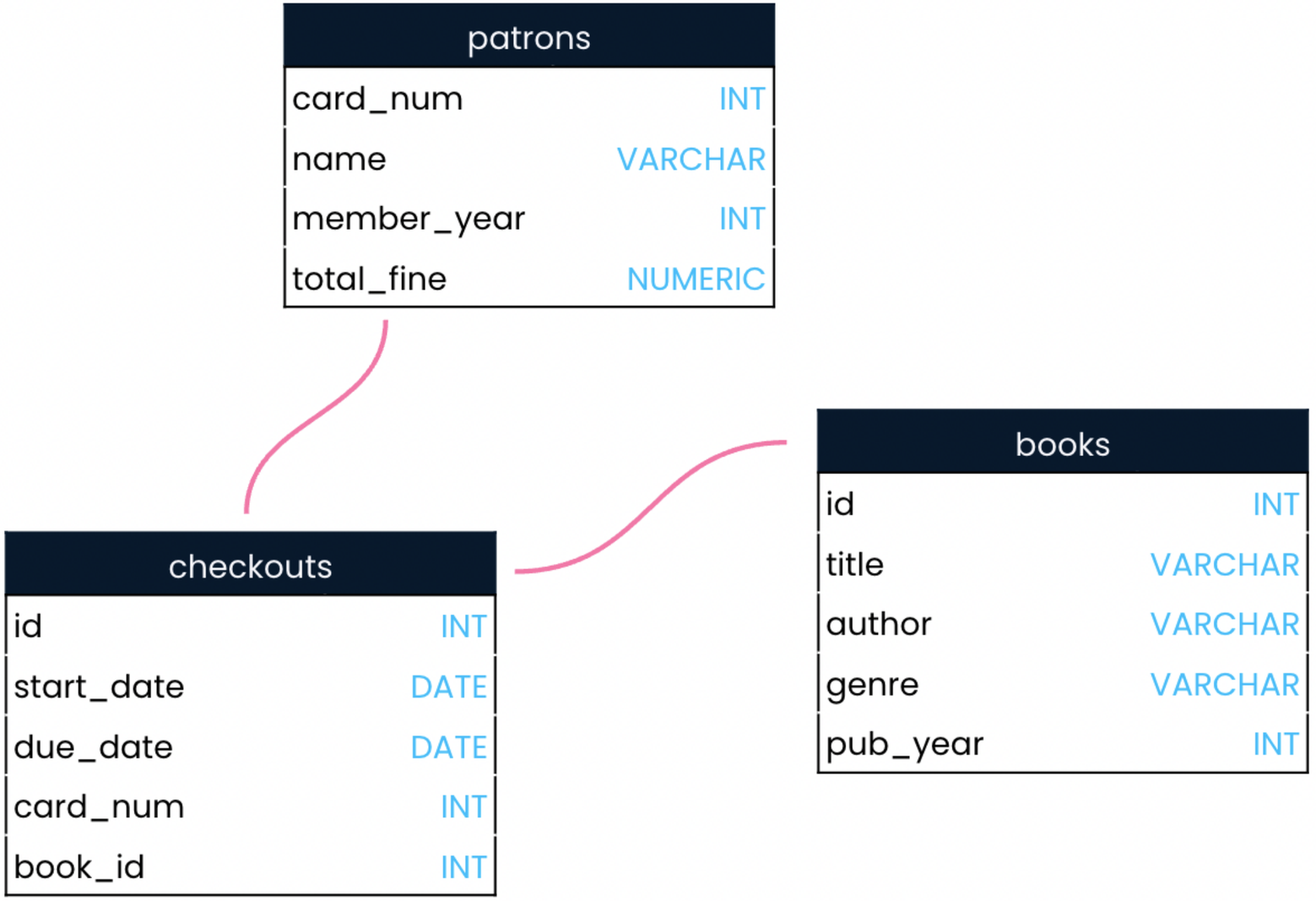


- Integers store whole numbers
- `INT` is a flexible and popular integer data type in SQL

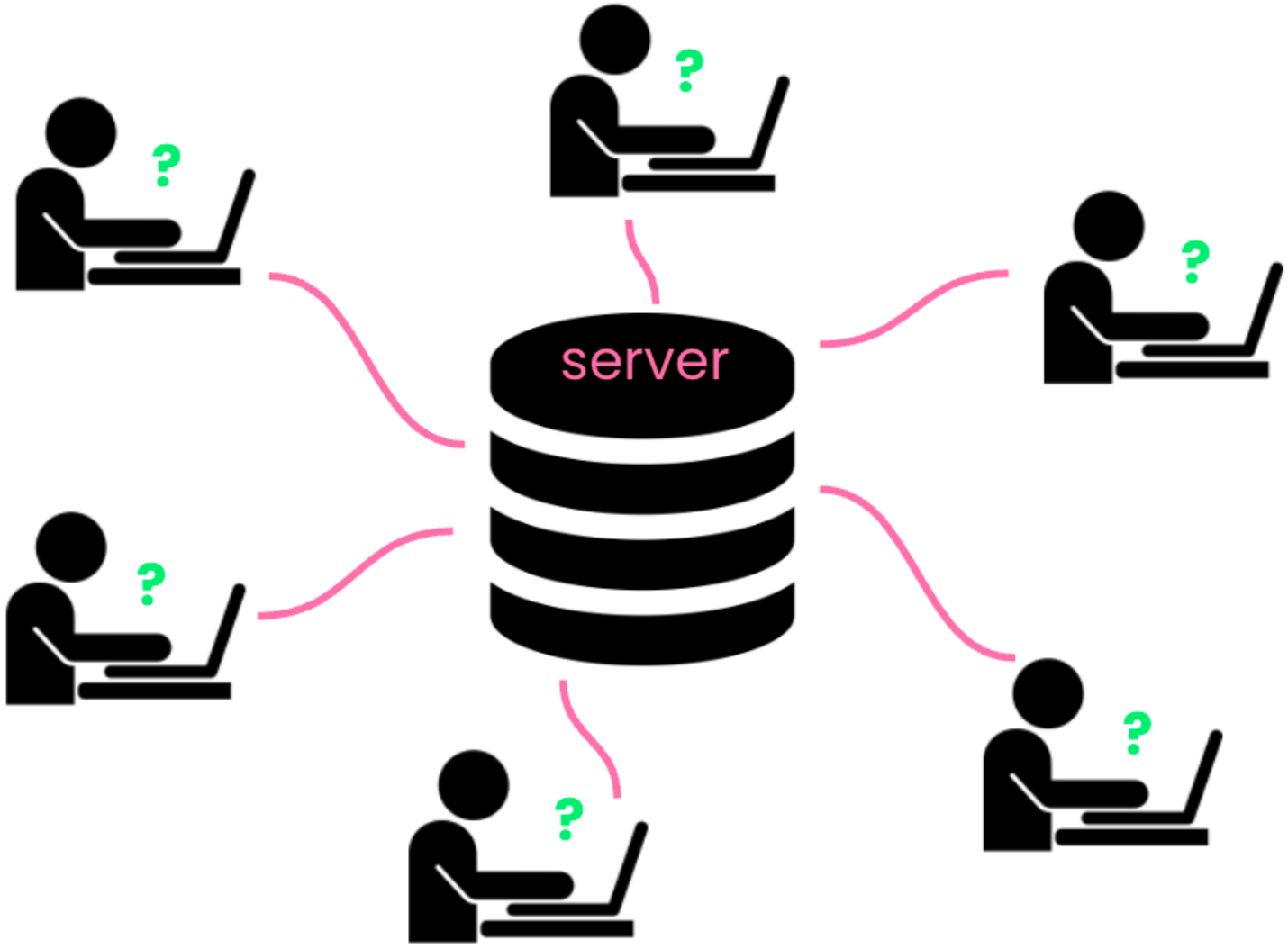
Floats

- Floats store numbers that include a fractional part
- `NUMERIC` is a flexible and popular float data type in SQL

Schemas


patrons
card_num INT
name VARCHAR
member_year INT
total_fine NUMERIC
checkouts
id INT
start_date DATE
due_date DATE
card_num INT
book_id INT
books
id INT
title VARCHAR
author VARCHAR
genre VARCHAR
pub_year INT

Database storage



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