INTRODUCTION TO BASICS OF BACKEND DEVELOPMENT

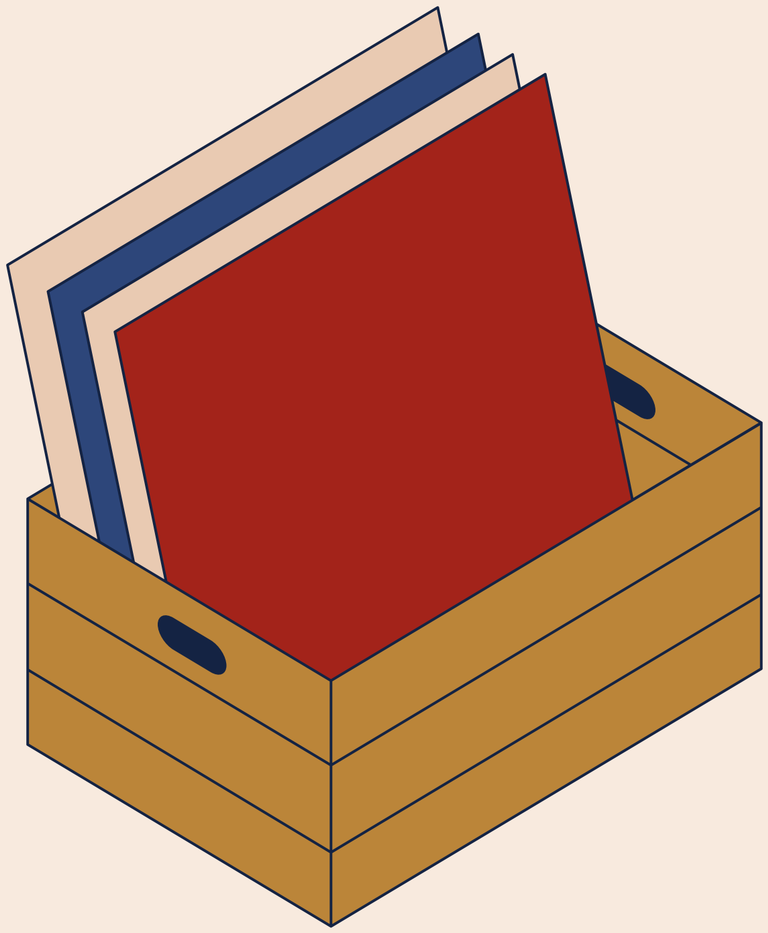
AGENDA

What is Backend Development?

Understanding Backend Stack Components

Databases

Example API



INTRODUCTION

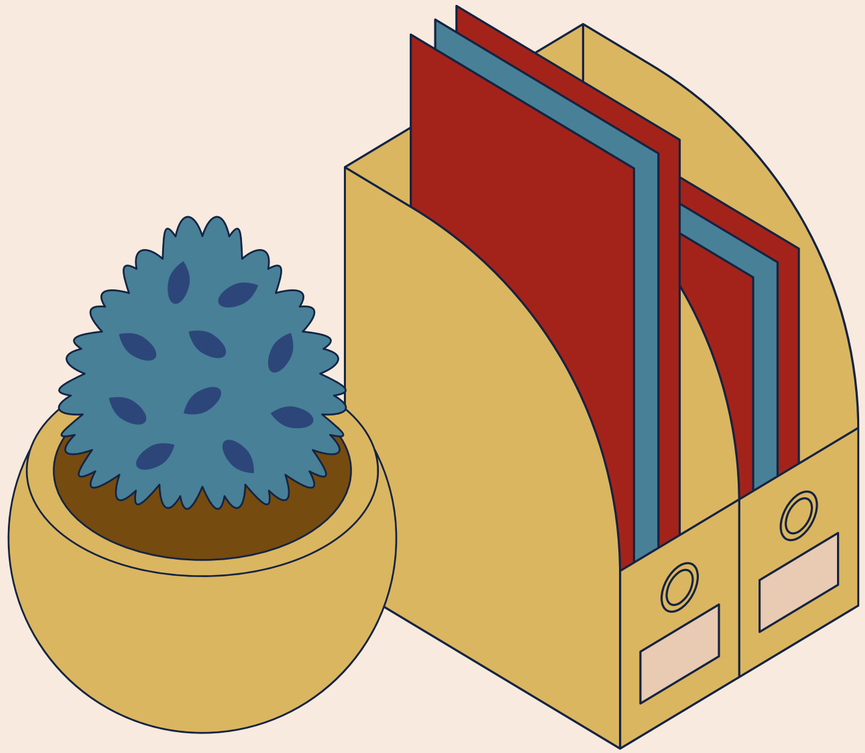
Backend development is like the magic behind a website! It's all about what happens in the background, so everything runs smoothly. This includes setting up databases, making sure the server is doing its job, creating APIs and handling user authentication.

COOL PROGRAMMING LANGUAGES LIKE PYTHON, JAVA, RUBY, AND PHP ARE USED TO MAKE ALL THIS MAGIC HAPPEN. THE GOAL? TO BUILD APPS THAT NOT ONLY LOOK GOOD ON THE BROWSER BUT PERFORM WELL TOO.

WHAT IS BUSINESS LOGIC?

Business Logic is the brain of your application. It's the custom rules and workflows that define how the system behaves—like calculating discounts, managing permissions, processing orders, or triggering notifications.

Business logic ensures the app does more than just store data—it makes decisions and enforces rules based on that data.



USER AUTHENTICATION

User Authentication Verifies who the user is. It's like a digital security gaurd—it checks credentials (e.g., username/password or tokens etc) and lets users in only if they are verified.

USER TYPES/ROLES

Admin

User/Member

eg: lecturer/student

Guest

OTHER KEY TERMS

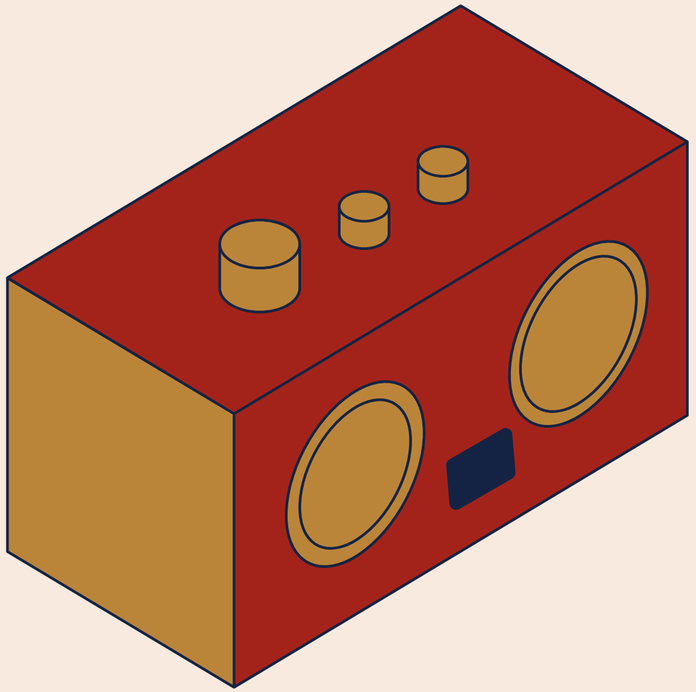
API

An API is a set of rules that allows different parts of software—or entirely different programs—to talk to each other.

- You send a request (like "give me all the posts").
- The API grabs that data from the backend and sends a response back to you.
- Normally this response data is meant to be read by a computer and may look very complicated (at first)

Routing

When someone types a URL or clicks a button on a website, that request needs to be handled—routing decides which part of your code should respond. For example, if a user visits /profile, the routing system sends that request to the "profile handler" that knows how to fetch and show their info.

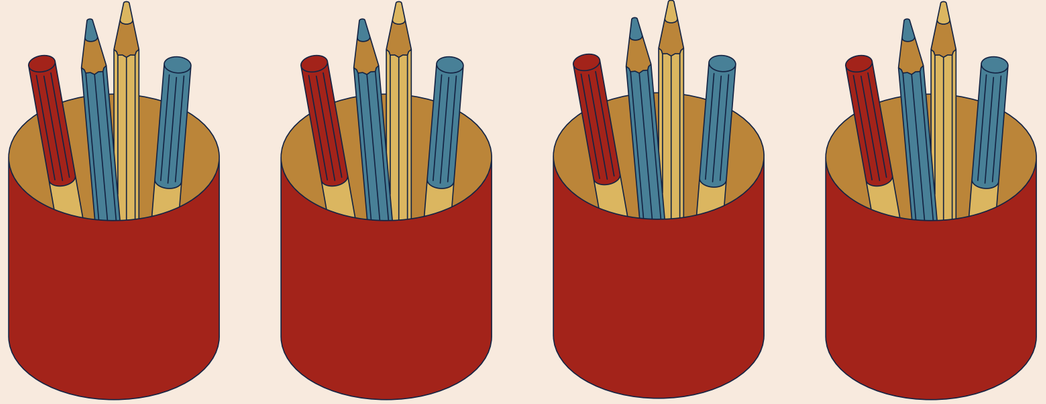


THE DATABASE

The database stores, organizes, and retrieves all the important information your app needs.

Database Operations These include reading, writing, updating, and deleting data (CRUD). The backend is responsible for connecting to databases, running queries, ensuring data integrity, and making sure everything is efficient and secure. Think of this as your app's memory bank.

THE CRUD



CREATE	Adds new data to the system (usually to a database)	POST
READ	Retrieves existing data without modifying it	GET
UPDATE	Modifies existing data	PUT / PATCH
DELETE	Removes existing data from the system	DELETE

- 📘 CREATE – ADD A NEW BOOK TO THE SHELF (E.G. SAVE A NEW USER OR POST)

- 📖 READ – LOOK AT A BOOK TO SEE WHAT'S INSIDE (E.G. FETCH USER DETAILS)

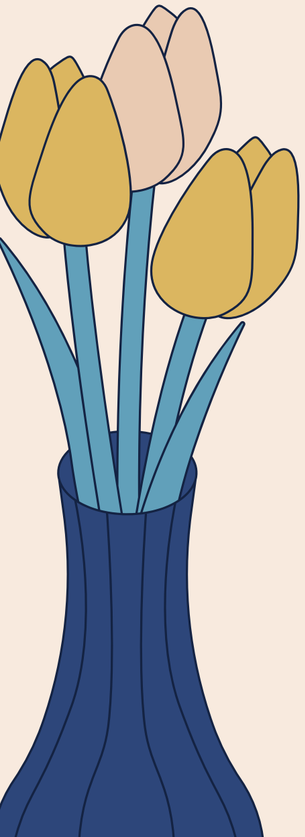
- ✏️ UPDATE – EDIT A BOOK'S CONTENT OR CHANGE ITS TITLE (E.G. UPDATE A USER PROFILE)

- 🗑️ DELETE – REMOVE A BOOK FROM THE SHELF (E.G. DELETE A POST OR USER)

DATABASE TYPES

Depending on the type of technology used, modern databases fall under the following two categories.

Choosing the right database is crucial because it affects how efficiently your data is stored and accessed The proper choice boosts performance, scalability and reliability. The wrong one can lead to slow queries, data loss and expensive infrastructure changes later on.

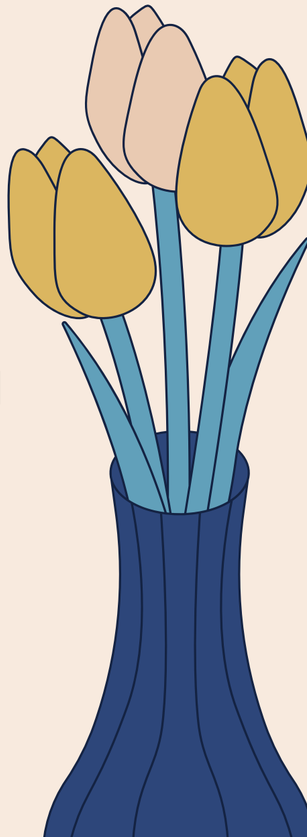


SQL

SQL is best for structured data with clear relationships—ideal for things like financial records, customer databases, or inventory systems where consistency and complex queries matter.

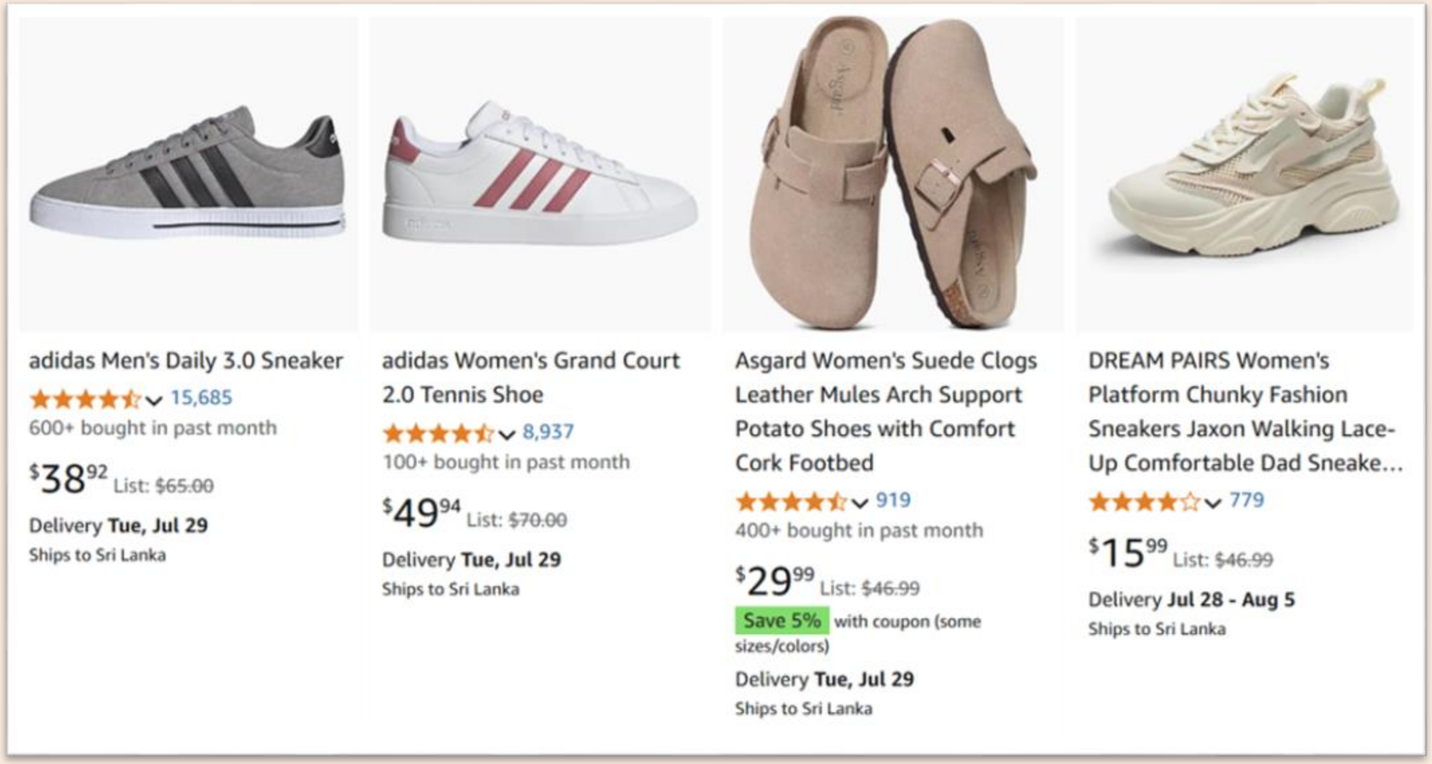
NOSQL

NoSQL shines when handling large volumes of varied or changing data—perfect for social media, real-time apps, and big data environments that need speed and flexibility.



EXAMPLE TASK

Try to draw the database table for the following items in a local Sri Lankan shop

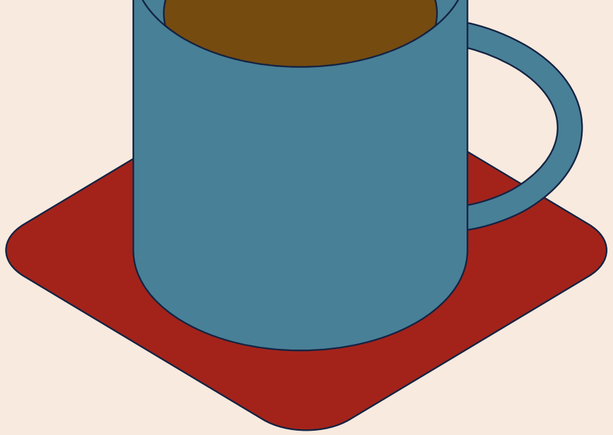


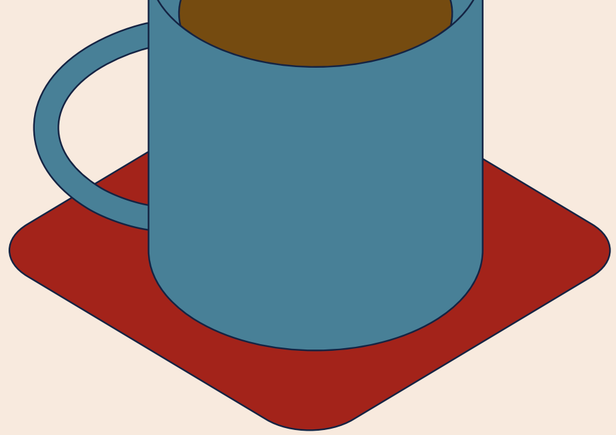
adidas Men's Daily 3.0 Sneaker
4.5 out of 5 stars 15,685
600+ bought in past month
$38.92 List: $65.00
Delivery **Tue, Jul 29**
Ships to Sri Lanka

adidas Women's Grand Court 2.0 Tennis Shoe
4.5 out of 5 stars 8,937
100+ bought in past month
$49.94 List: $70.00
Delivery **Tue, Jul 29**
Ships to Sri Lanka

Asgard Women's Suede Clogs Leather Mules Arch Support Potato Shoes with Comfort Cork Footbed
4.5 out of 5 stars 919
400+ bought in past month
$29.99 List: $46.99
Save 5% with coupon (some sizes/colors)
Delivery **Tue, Jul 29**
Ships to Sri Lanka

DREAM PAIRS Women's Platform Chunky Fashion Sneakers Jaxon Walking Lace-Up Comfortable Dad Sneake...
4.0 out of 5 stars 779
$15.99 List: $46.99
Delivery **Jul 28 - Aug 5**
Ships to Sri Lanka





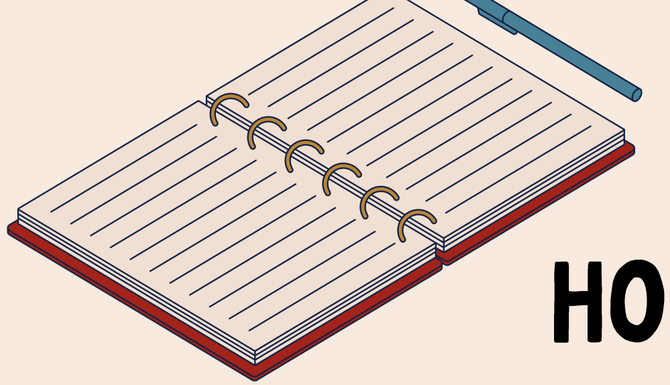
ANSWER

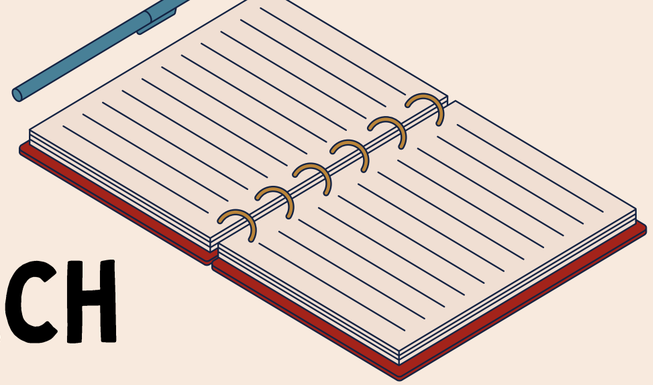
Try to draw the database table for the following items in a shopfront

Title	Rating	No. of Reviews	Price	Delivery Type
adidas Men's daily sneaker	4.95	19,965	38.92	Free

Next, try to identify the datatype of each column.
(Find the actual names; the ones listed in the example below are pretend names)

Eg: English Sentence, Normal Number, Decimal Number etc





HOW SYSTEMS SPEAK TO EACH OTHER

An API (Application Programming Interface) is like a messenger that lets two apps or systems talk to each other. *eg: GET 5 search results from between dates 2024-2025 and sort by Ascending*

KEY TERMS

- **Endpoint**
- **Query Parameter**
- **JSON**

TESTING IT OUT

- API V2 - Docs - Dog API by kinduff
- Cat as a service (CATAAS)
- Memegen.link

THANK YOU FOR LISTENING!