



Politecnico  
di Torino

Introduzione alle Applicazioni Web

# Web architectures

Juan Pablo Sáenz



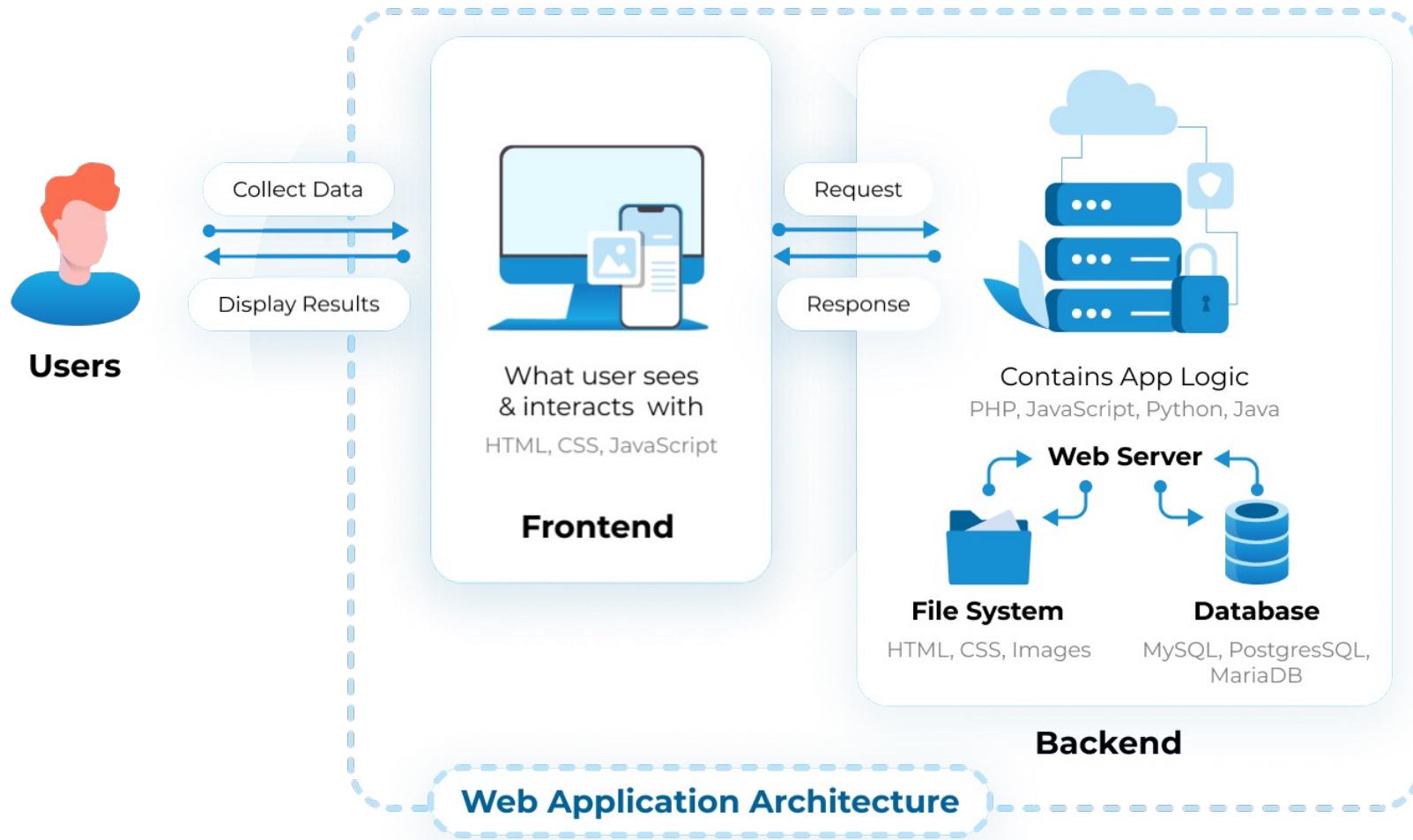
# Goals

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- Understanding **web architecture** and its importance.
- Identify key components and network **protocols**.
- Analyze **interaction** and **communication** between components.
- Get an overview of the **course topics**  and how they fit together in the perspective of building a **complete web application**.

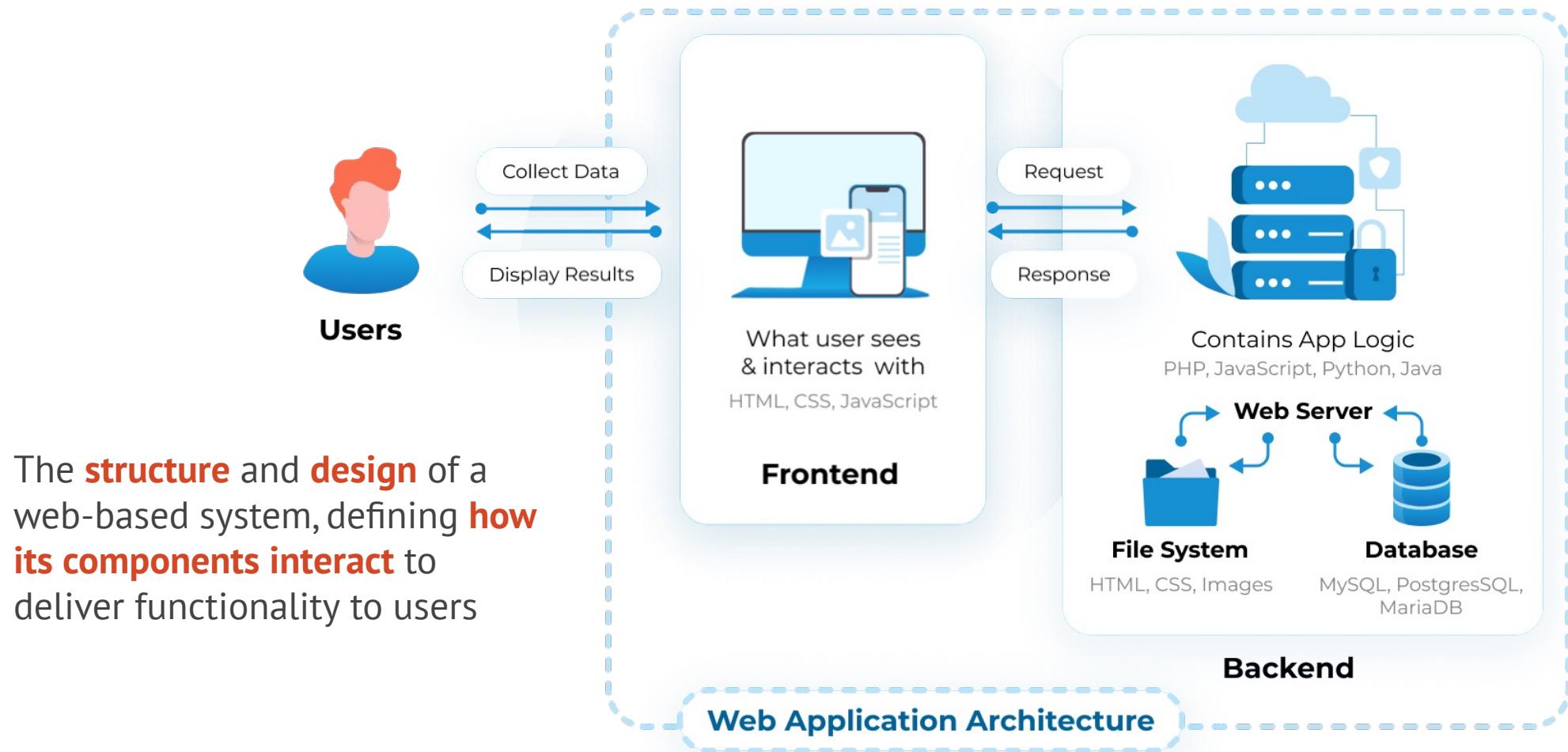


# The course's most important slide





# The course's most important slide



# Web architecture

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Once the architecture is established developers can determine the appropriate

- **technologies** (e.g., **databases**, caching systems),
- **frameworks** (**Flask**, React, Django, Spring Boot),
- **languages** (JavaScript, **Python**, Java),
- **protocols** (**HTTP/HTTPS**, WebSockets, GraphQL),
- and **infrastructure** (**cloud platforms**, containerization, server hosting)

# Web architecture

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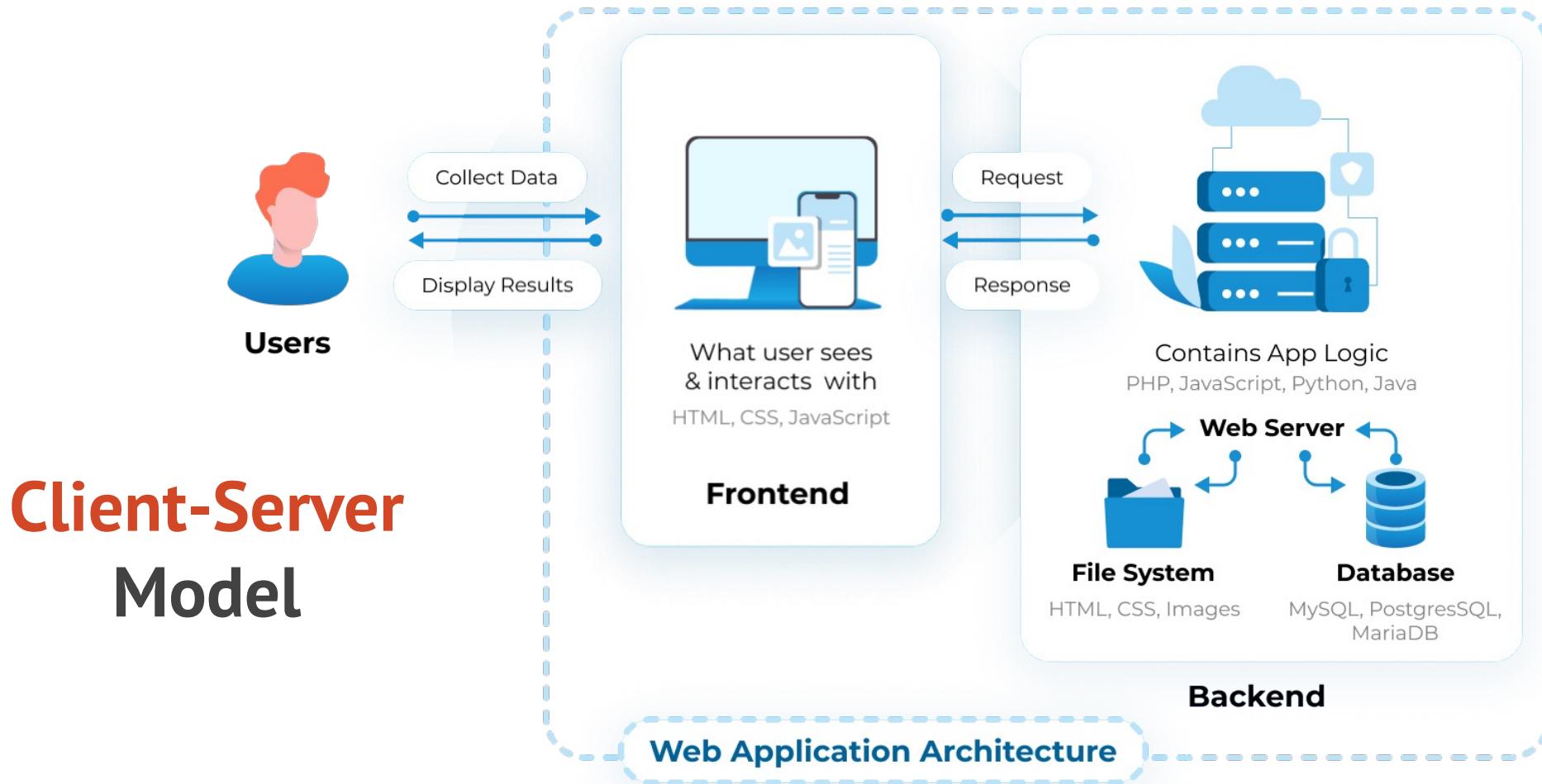
⚠ Errors in **architecture design** are significantly **more costly** and **difficult** to fix than errors in implementation

- redesigning infrastructure,
- rewriting large portions of the codebase,
- or even migrating to a different technology stack.

Therefore, **careful architectural planning is essential** before moving to implementation!

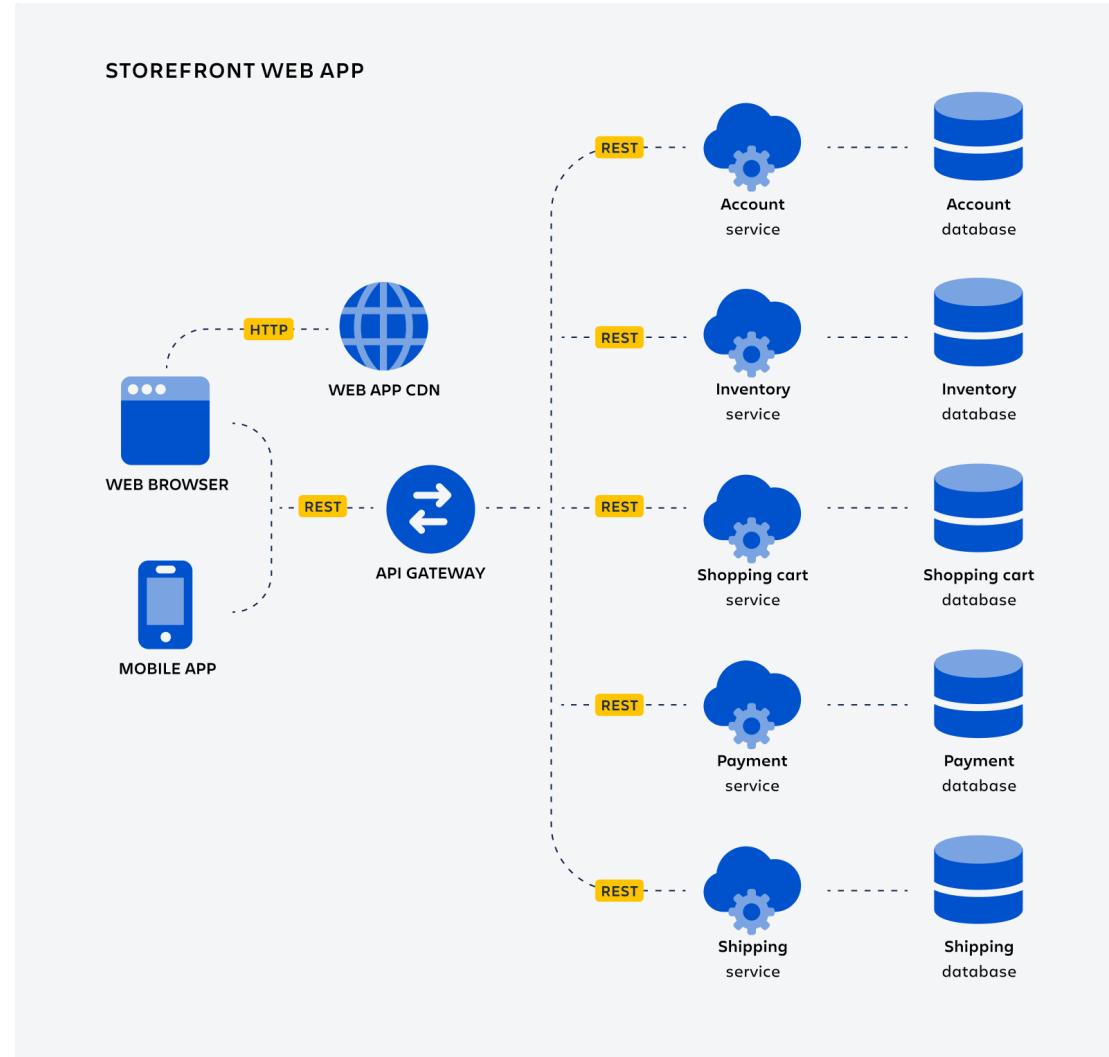


# The course's most important slide



# A random architecture example

**Microservices  
Architecture:  
What can we infer  
from it?**



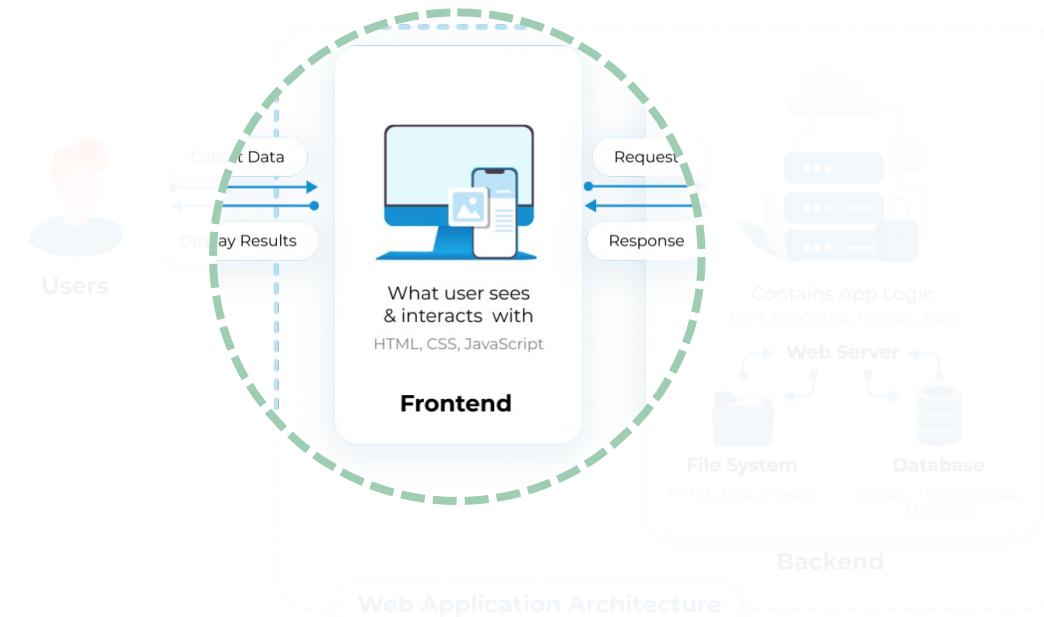


# Web architecture components: Frontend

**Frontend:** what the user sees and interacts with

Languages:

- **HTML:** a markup language used to **structure content on the web**. It defines elements like headings, paragraphs, images, and links.
- **CSS:** a style sheet language used to **control the presentation of HTML elements**, such as colors, fonts, and layouts.
- **JavaScript:** a programming language used to **add interactivity and dynamic behavior** to web pages.



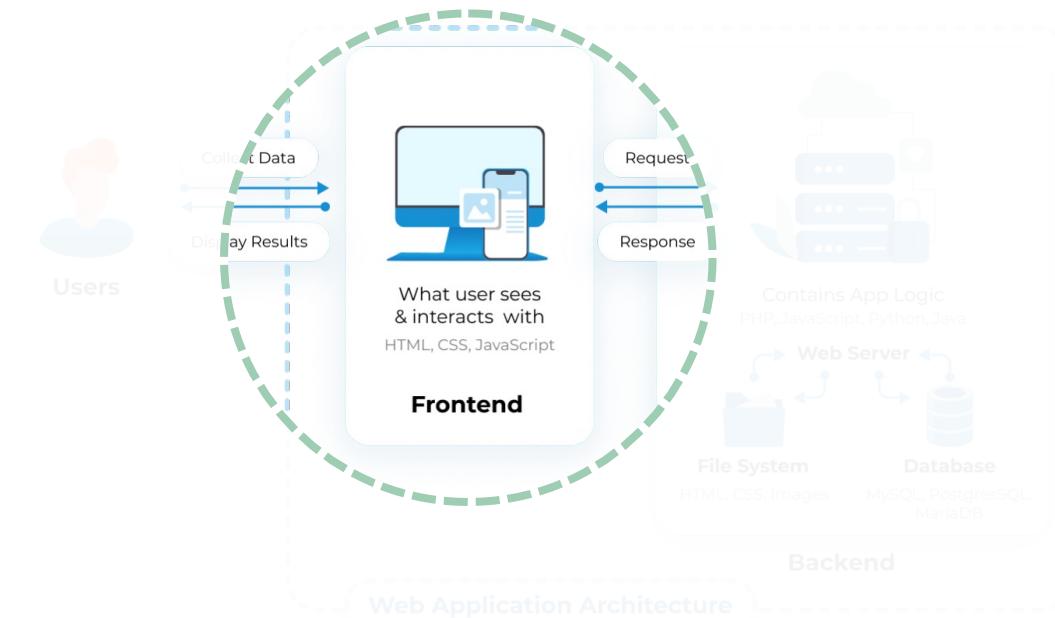


# Web architecture components: Frontend

**Frontend:** what the user sees and interacts with

**Applications:**

- **Browser:** an application that **retrieves, interprets, and displays web content**, including HTML, CSS, and JavaScript.





# Web architecture components: Backend

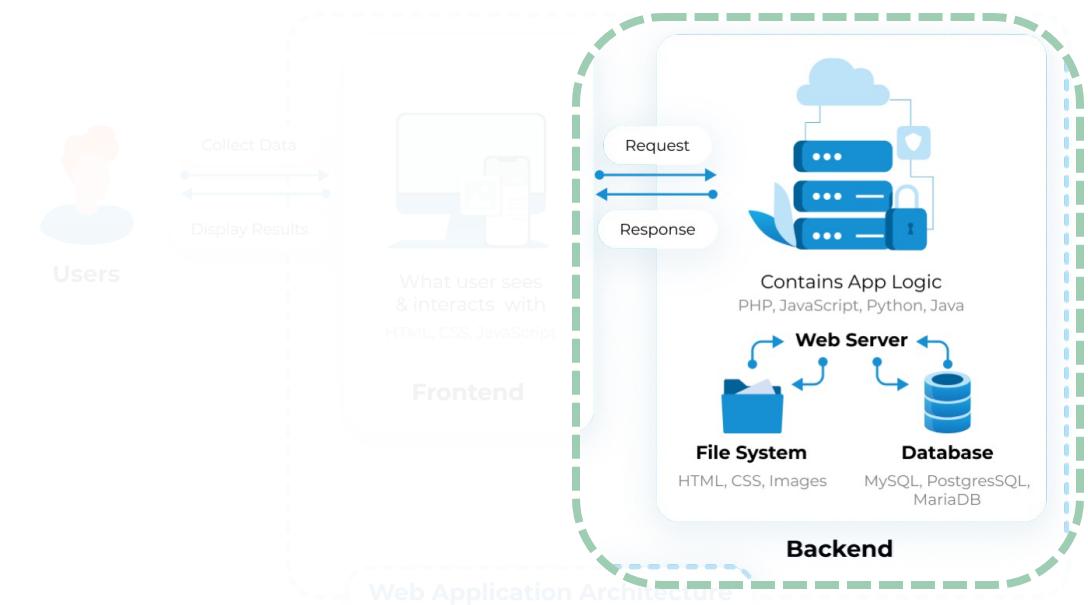
**Backend:** The part of a web application that works behind the scenes, handling **data, logic**, and server communication.

## Components:

**Server:** a computer or system that provides **resources, data, services, or programs** to other computers, known as clients, over a network.

**Web server:** hosting websites, handling HTTP requests from clients (like browsers), and delivering web pages, images, and other content to the client's device.

Intermediary between the client and the **database**

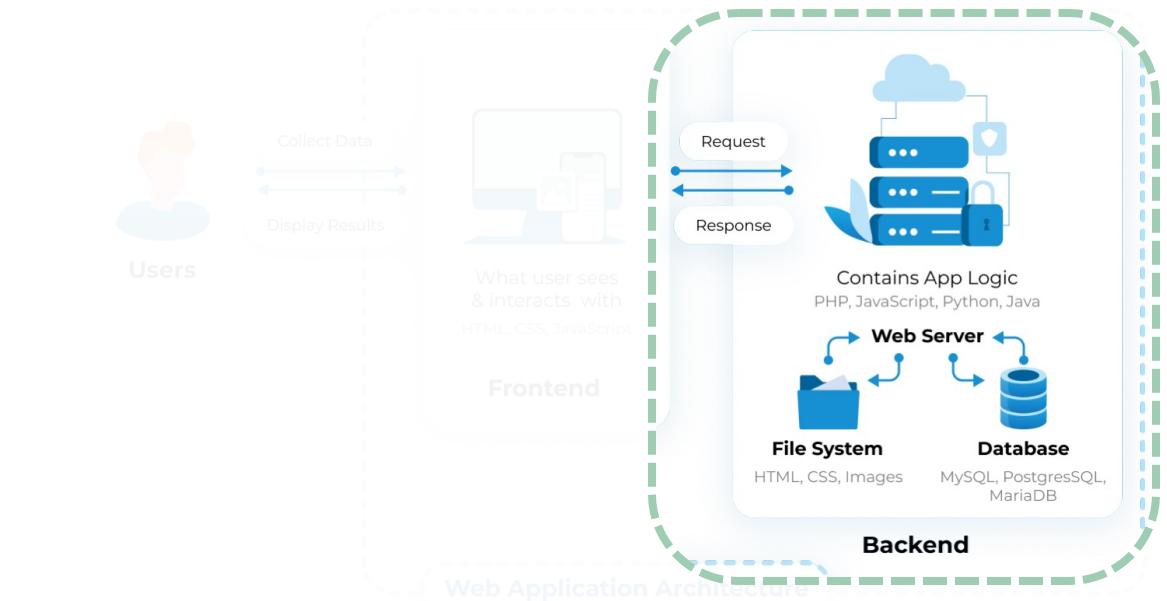




# Web architecture components: Backend

**Database:** a system that **stores and organizes data**, making it easy to retrieve, manage, and update.

- It ensures data integrity, security, and performance, often structured in **tables, rows, and columns**.
- **SQL (Structured Query Language)** is the language used to **interact with databases**, allowing users to search, insert, update, and delete data.

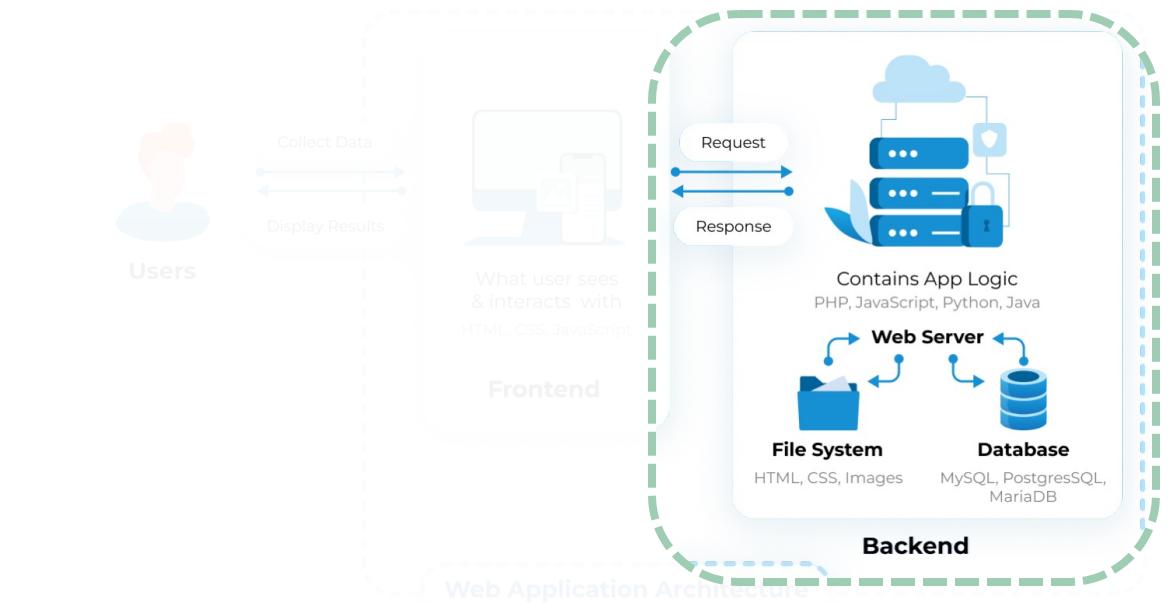




# Web architecture components: Backend

**File system:** a system that organizes and stores **files** on a storage device.

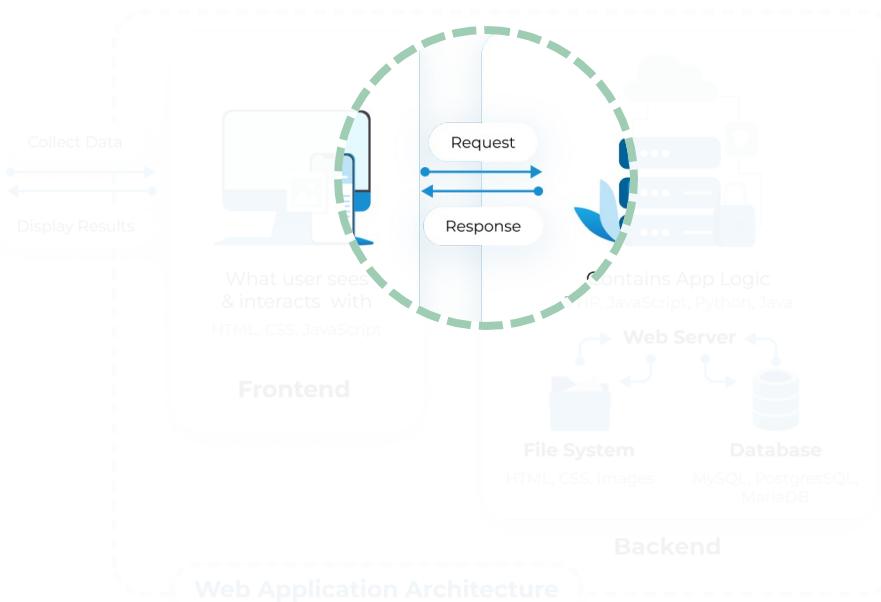
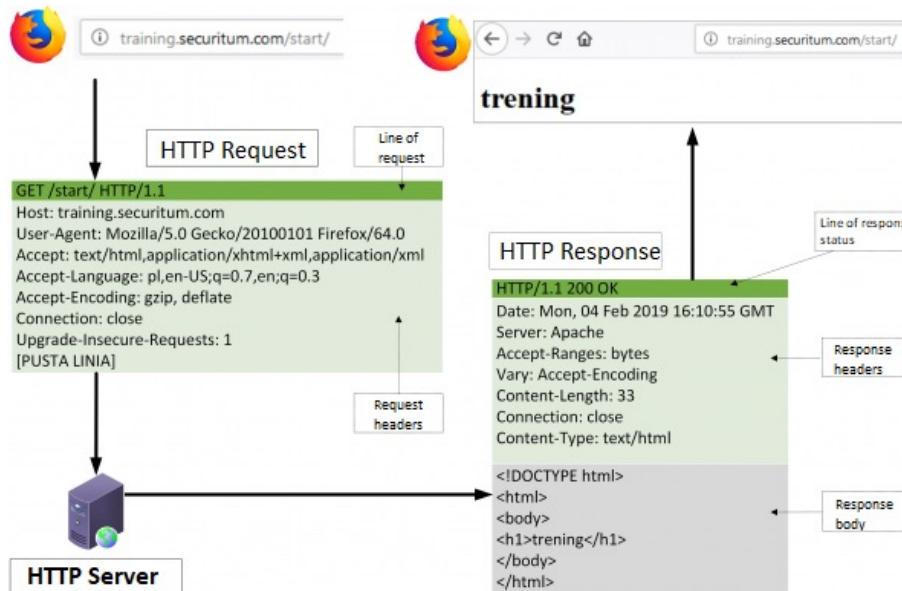
- Manages how **data is saved, accessed, and retrieved** in the backend of an application.



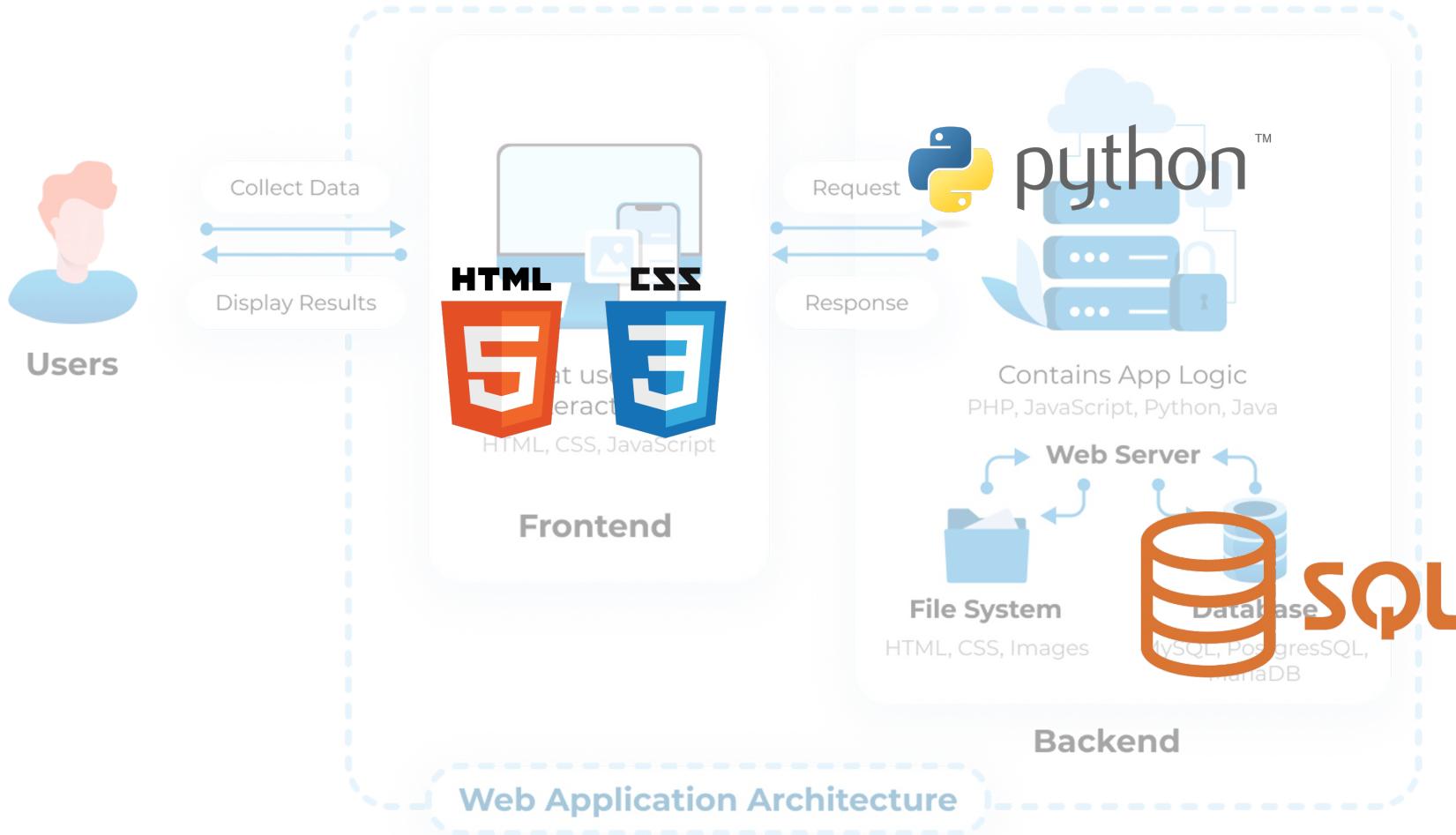


# Web architecture components: HTTP Protocol

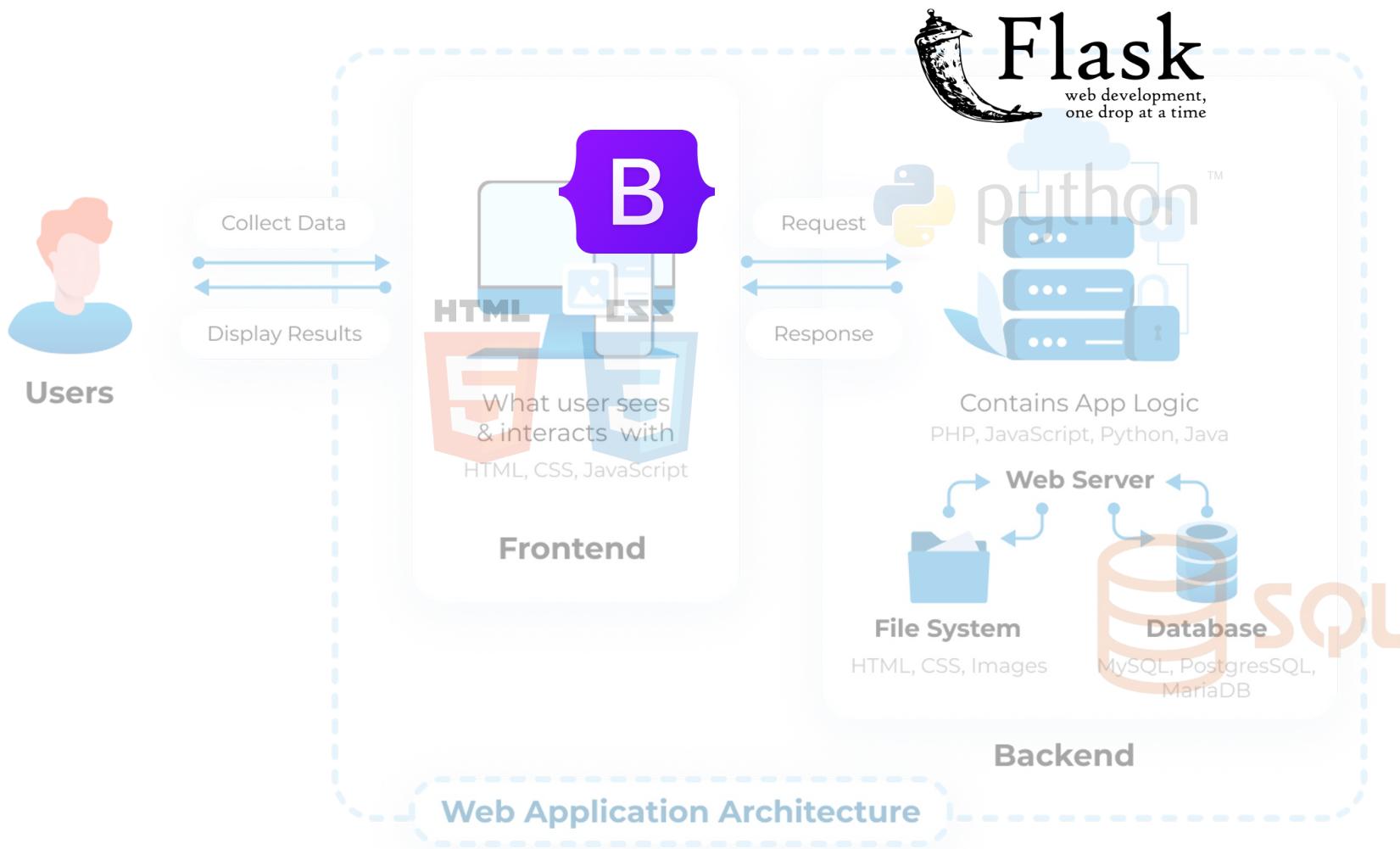
**HTTP Protocol:** the protocol used for **transferring data over the web**, allowing communication between **clients** (like browsers) and **servers** by sending requests and receiving responses



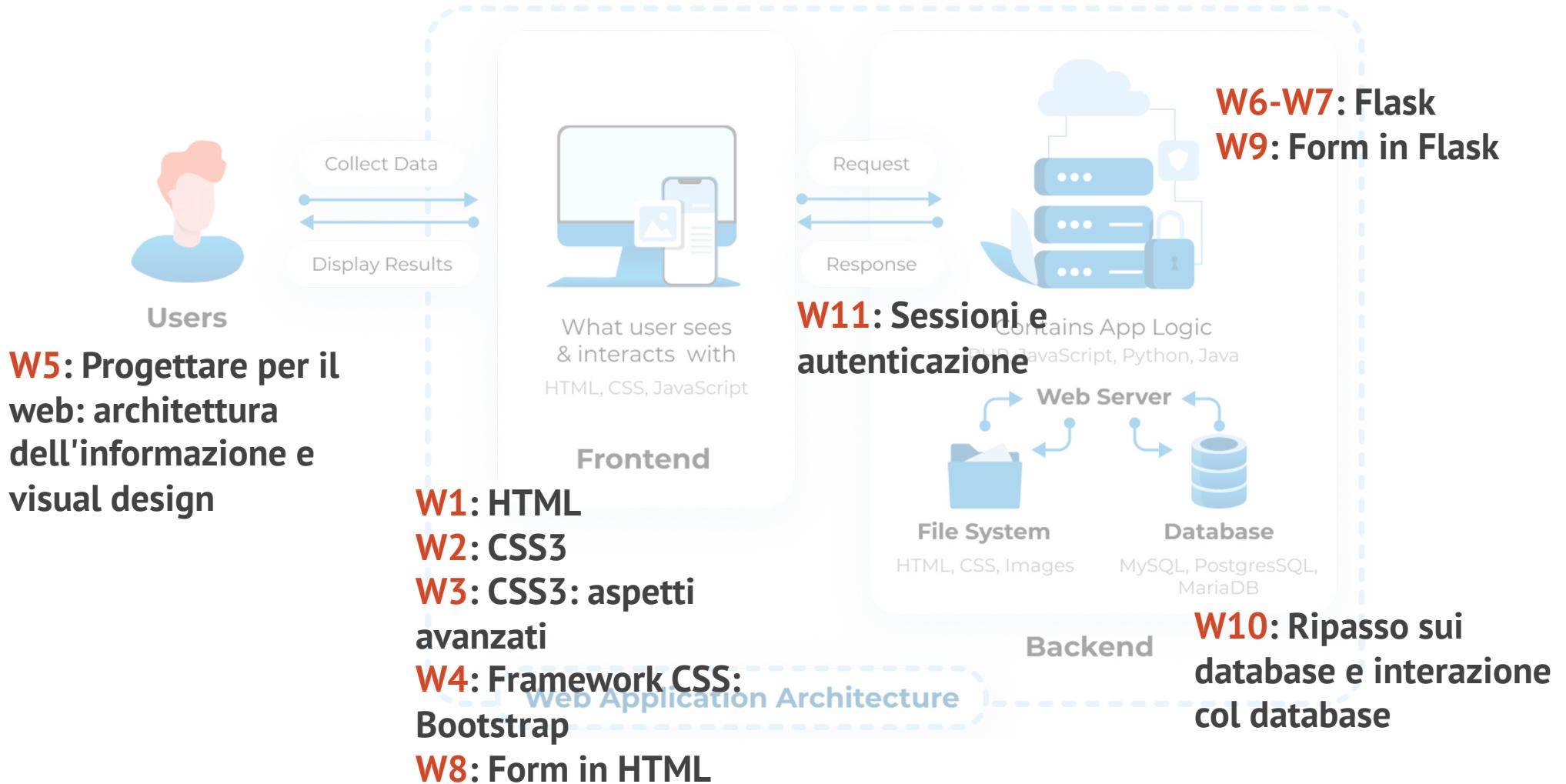
# The 📝 languages we will use in the course



# The frameworks we will use in the course



# The 📚 topics we will address throughout the course





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