Web Development

Advanced Programming I

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2024-III

Outline

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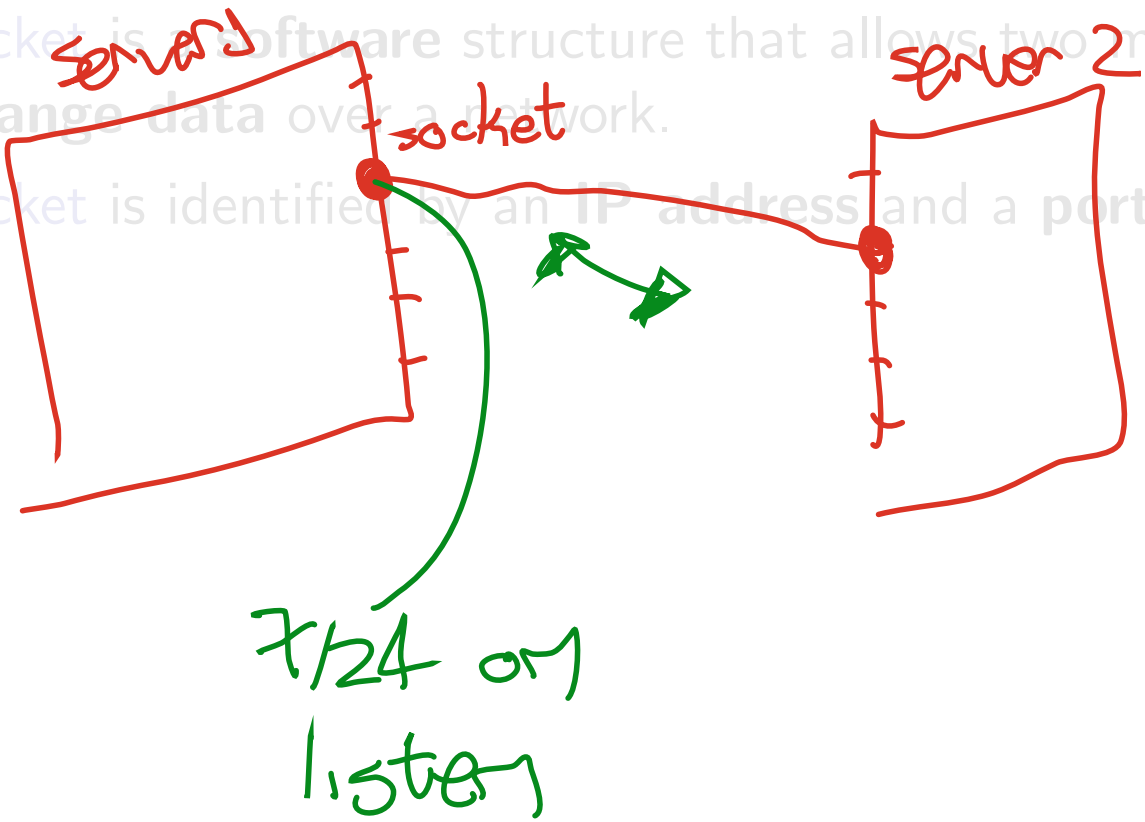
Sockets

- A socket is an **endpoint** for communication between two machines over a network.
- A socket is a **software** structure that allows two machines to **exchange data** over a network.
- A socket is identified by an **IP address** and a **port number**.



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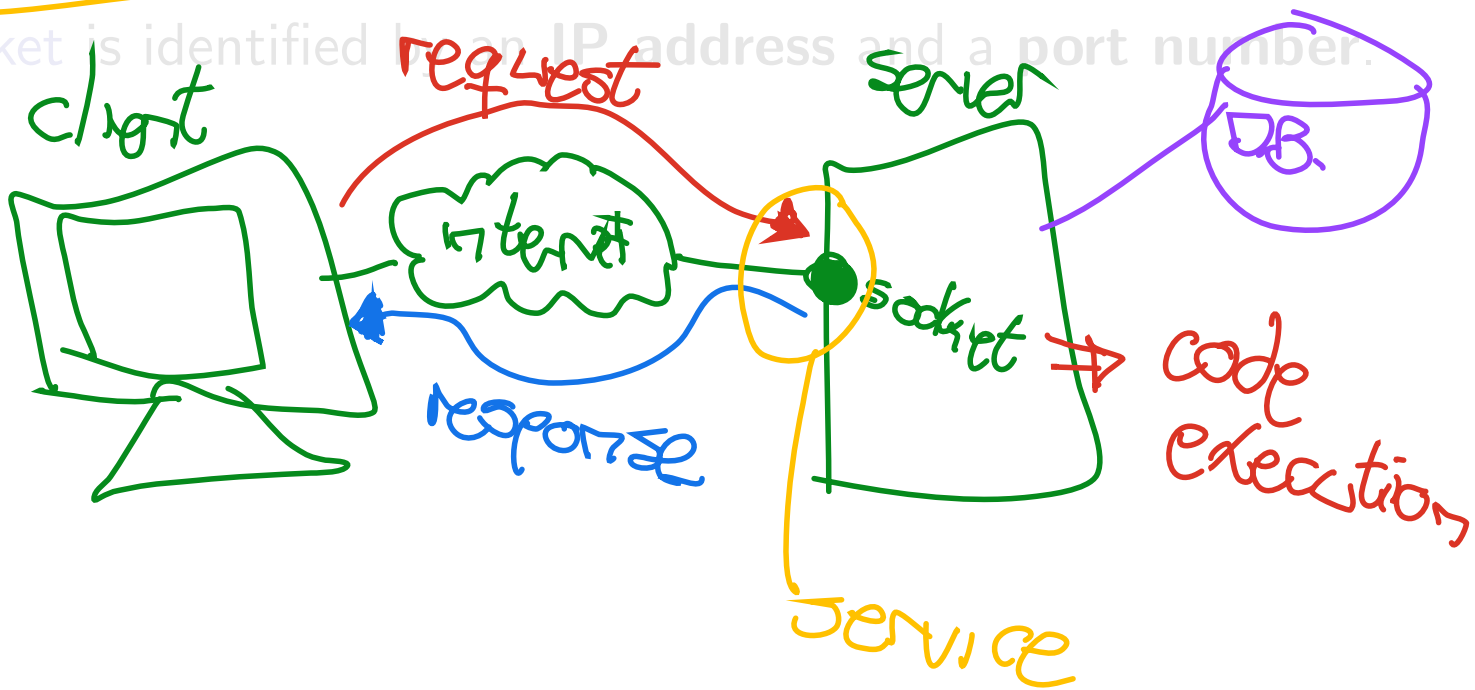

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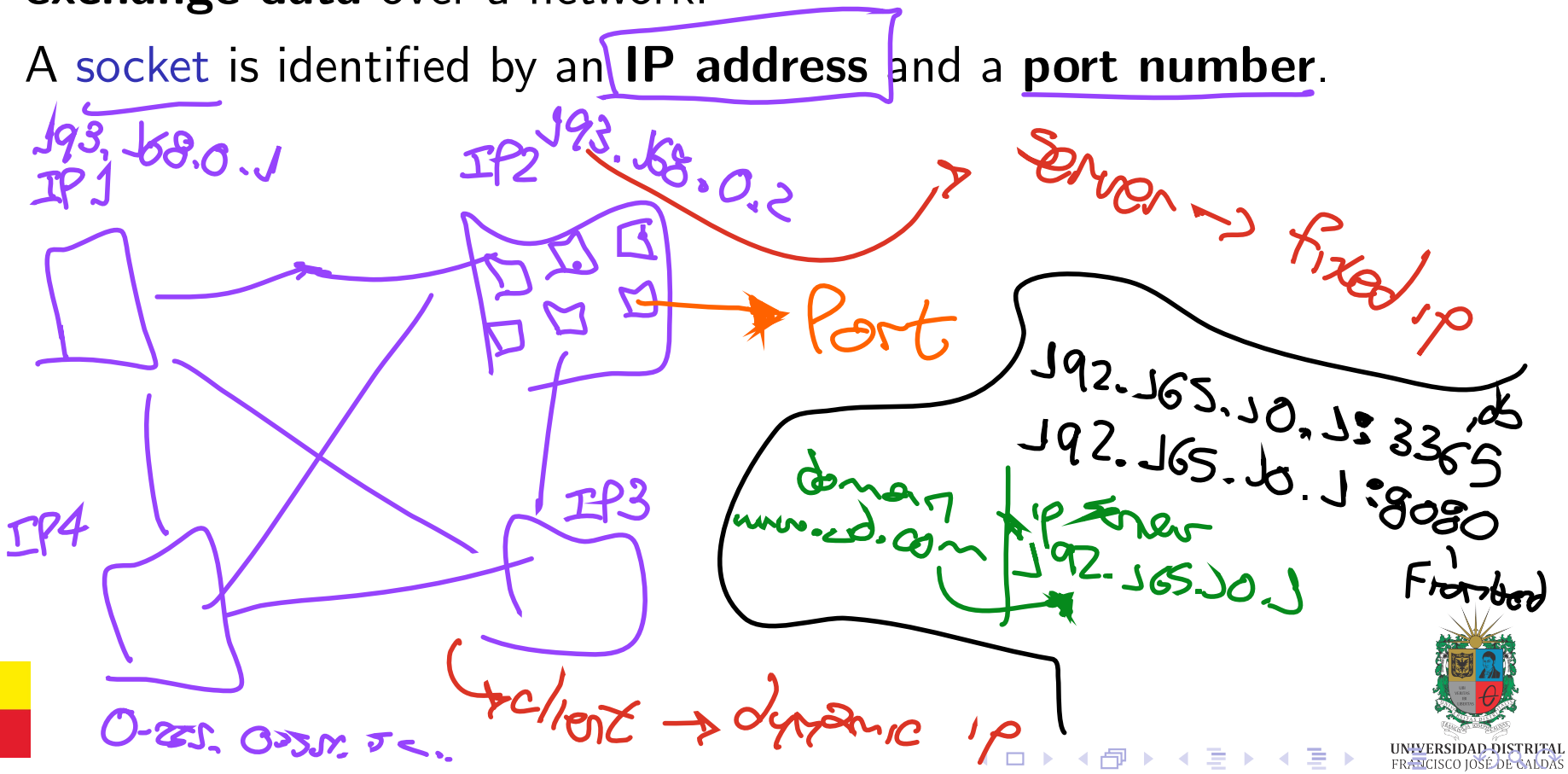

Web Services

- A web service is a **software** system designed to support **interoperable** machine-to-machine interaction over a network.
- It has an **interface** described in a **machine-processable** format (specifically WSDL).
- Other systems interact with the web service in a manner prescribed by its **description** using **RESTful**, typically conveyed using **HTTP** with an **JSON** serialization in conjunction with other **web-related standards**.
- A web service is a **collection** of **open protocols** and **standards** used for **exchanging data** between applications or systems.
- Software applications written in various programming languages and running on various platforms can use web services to **exchange data** over computer networks like the **Internet** in a manner similar to **inter-process communication** on a single computer.

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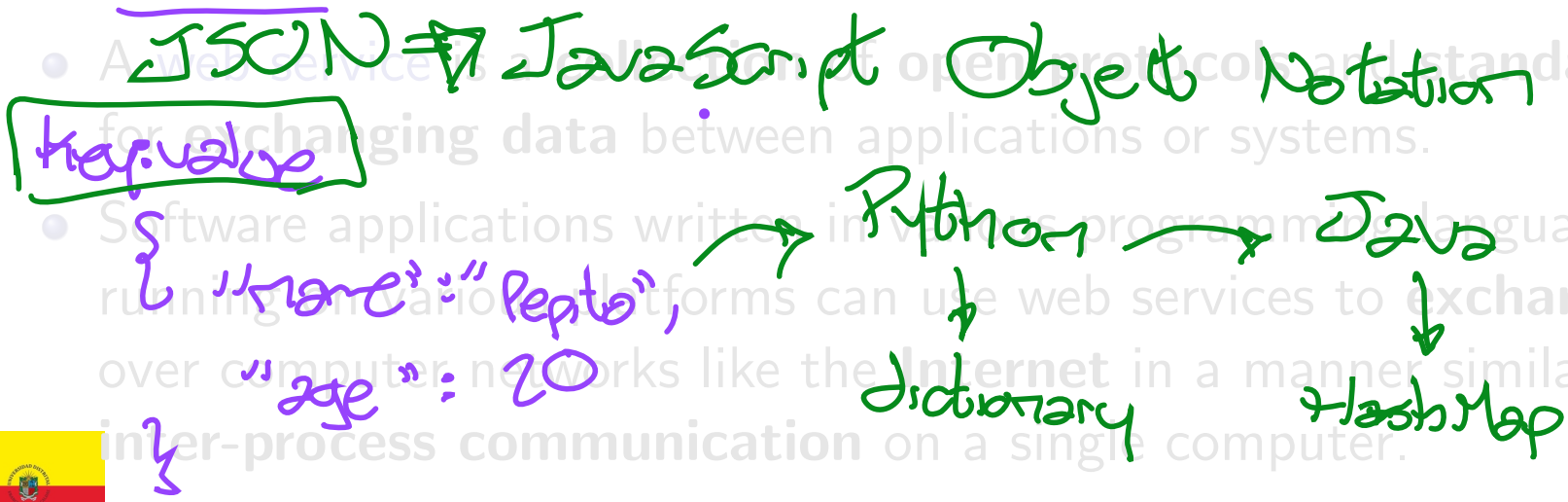

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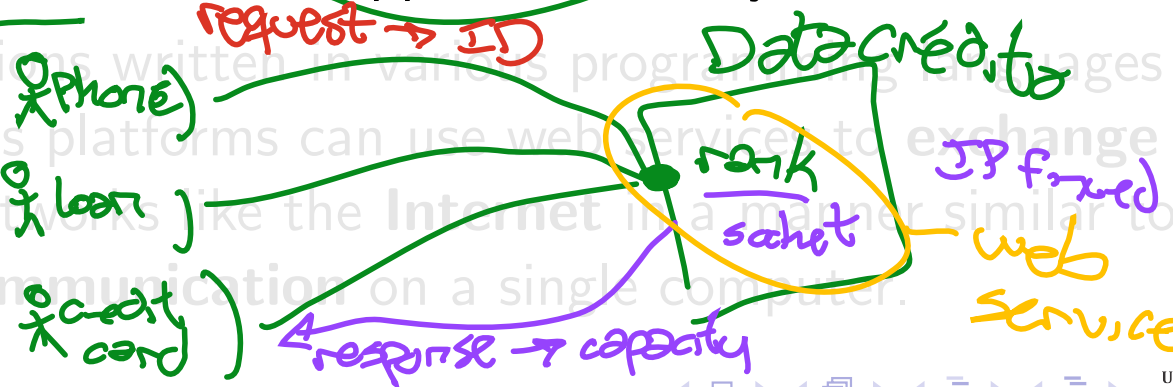

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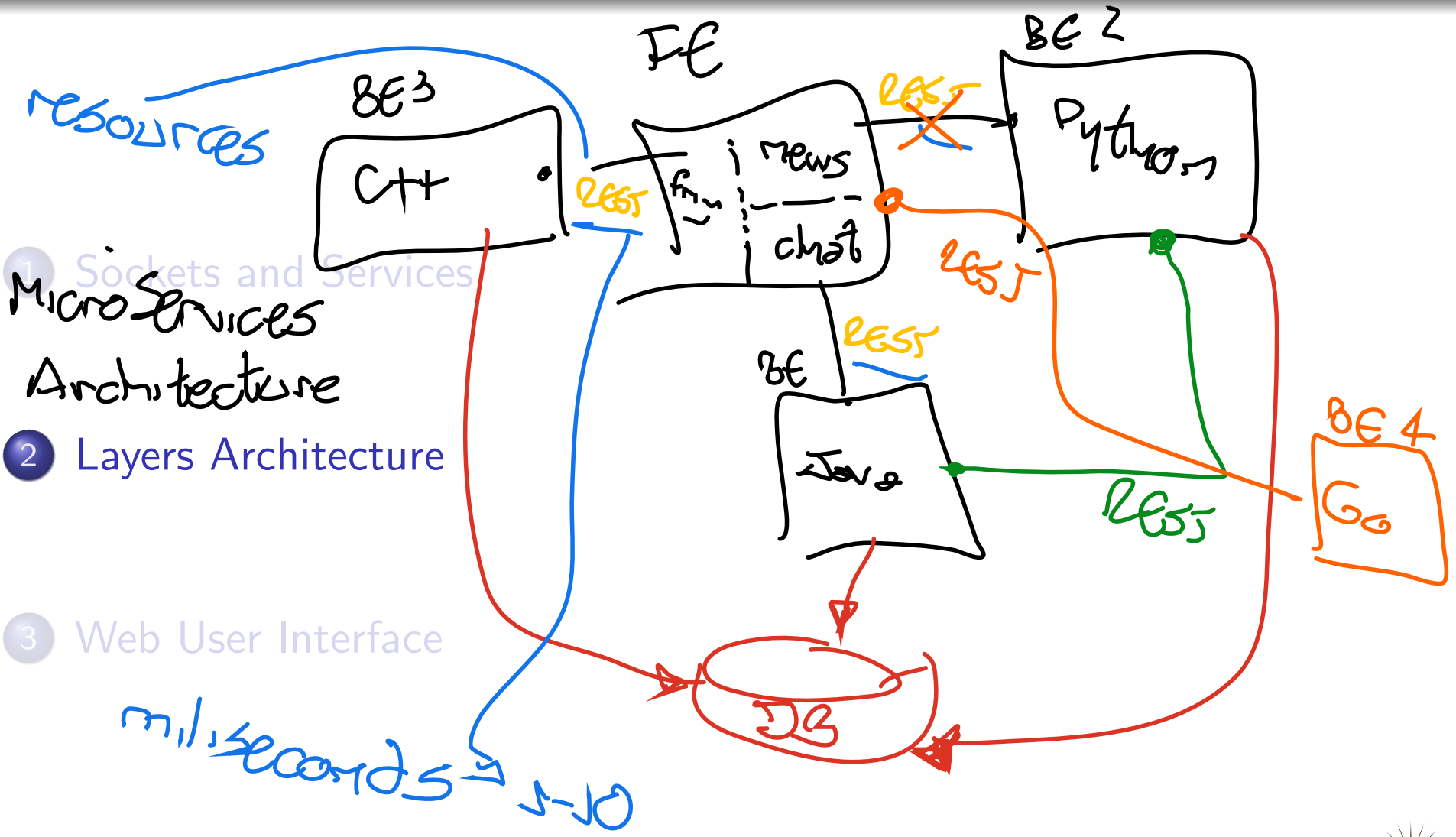
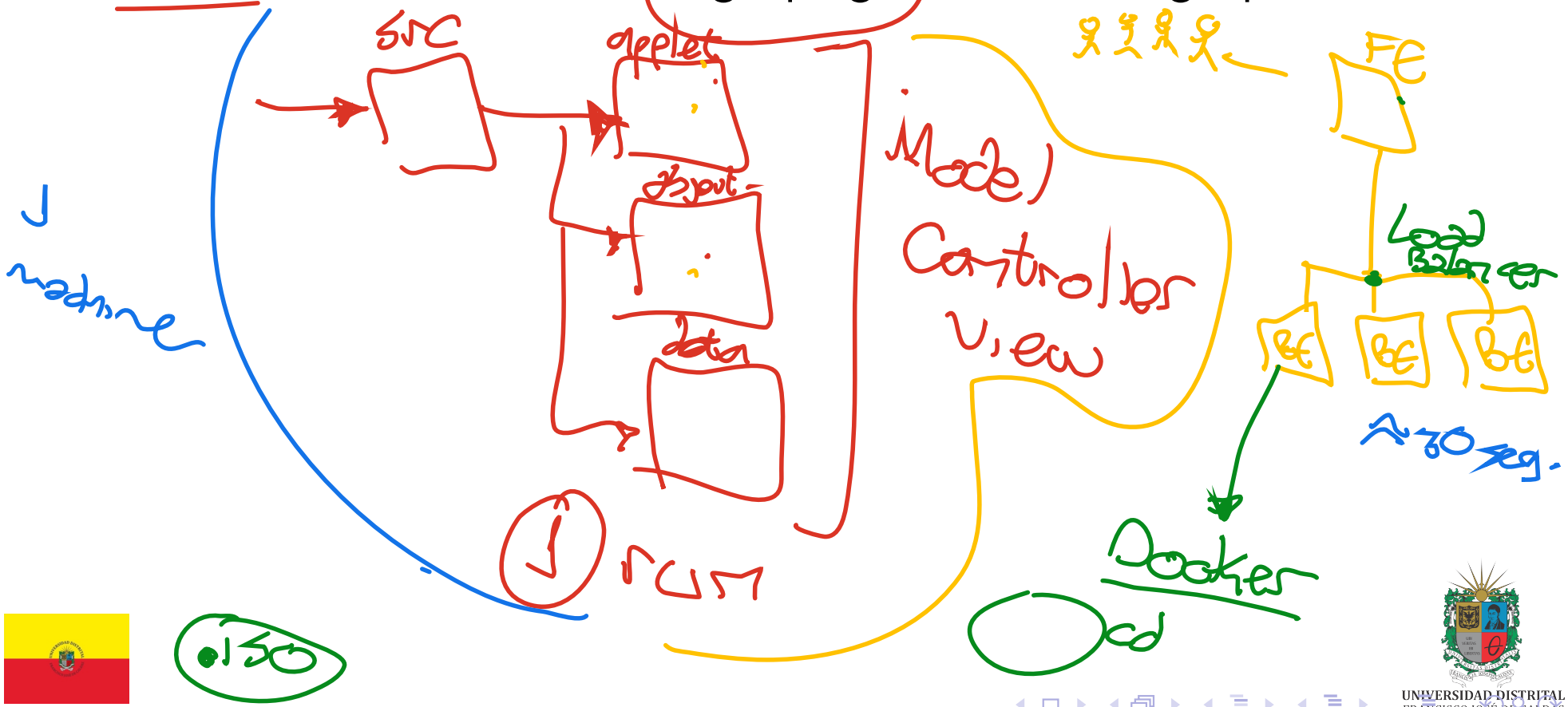


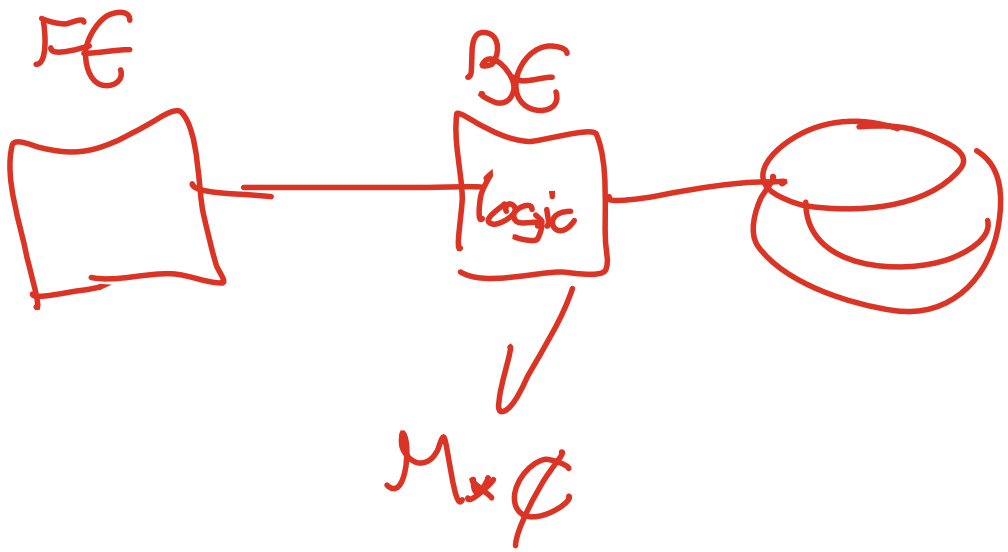
Monolithic Architecture

- A monolithic architecture is a **traditional** unified model for the design of a software program.
- In a monolithic architecture, the **user interface** and **data access code** are combined into a single program from a single platform.



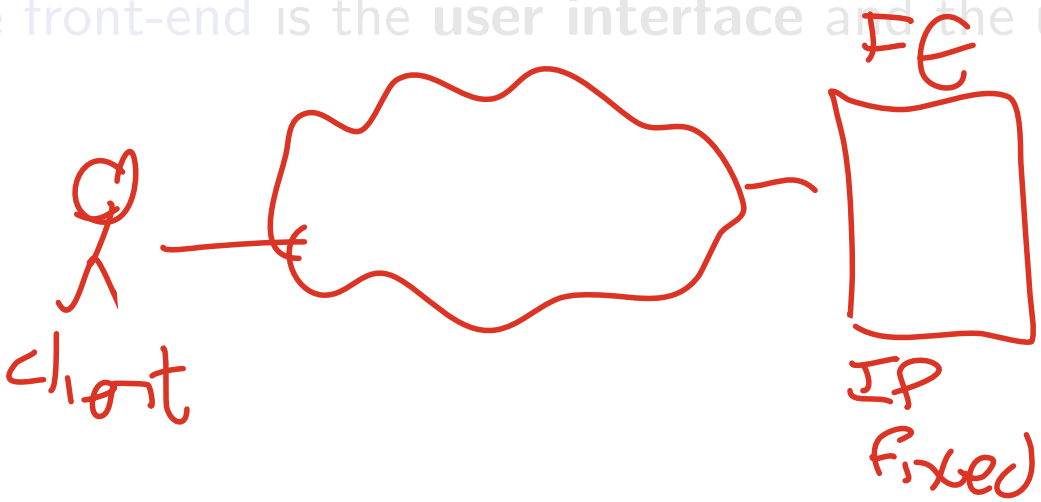
BackEnd Layer

The back-end is the **server-side** of the application and everything that communicates between the **database** and the **browser**.



FrontEnd Layer

- The front-end is the **client-side** of the application and everything that the user interacts with.
- The front-end is the **presentation layer** of the application.
- The front-end is the **user interface** and the **user experience**.



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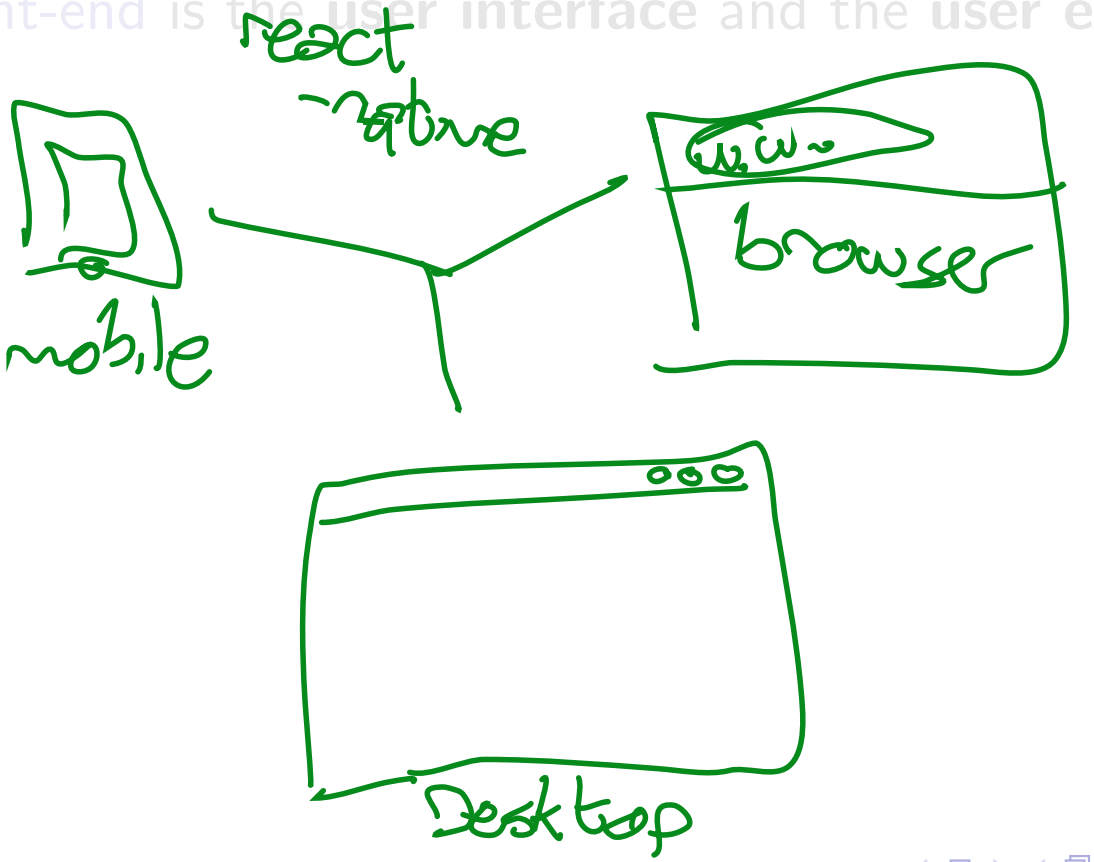

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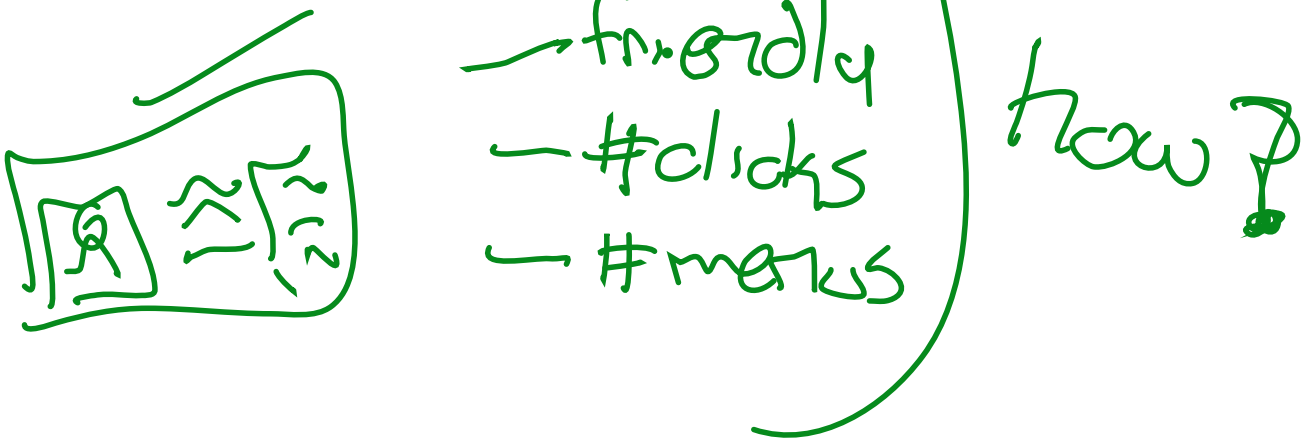
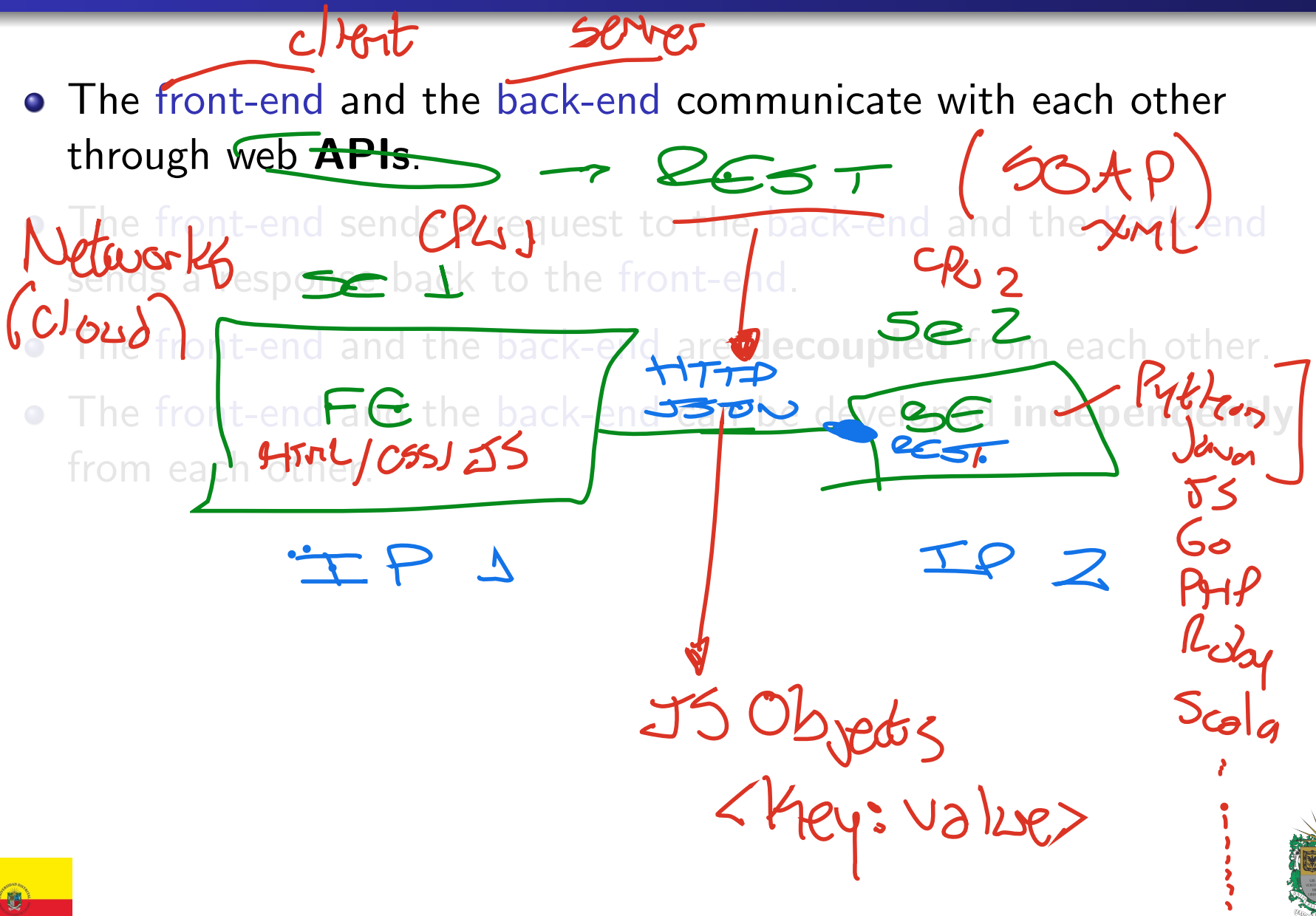


Communication

- The front-end and the back-end communicate with each other through web ~~APIs~~.



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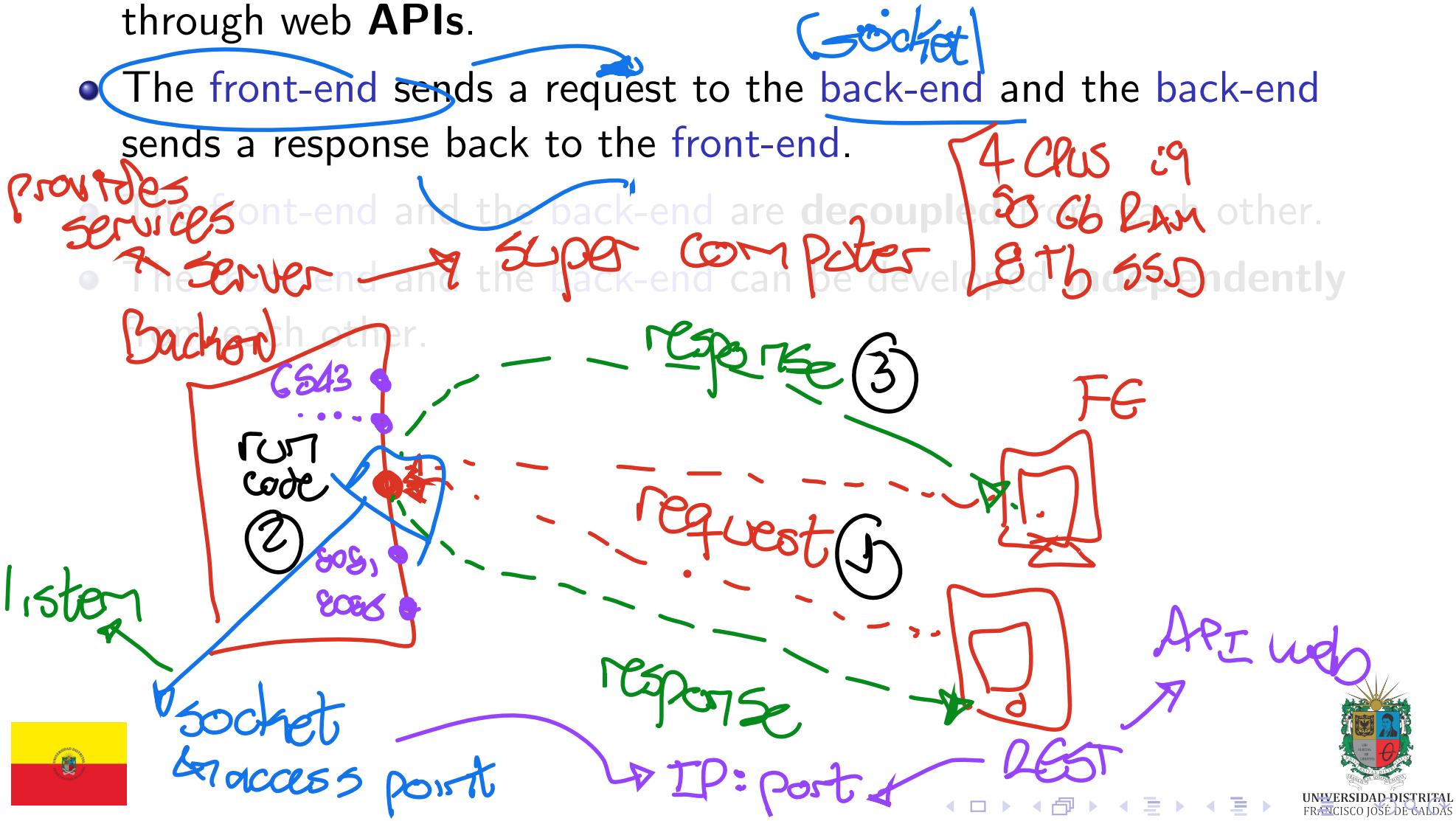

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- The front-end sends a request to the back-end and the back-end sends a response back to the front-end.
- The front-end and the back-end are **decoupled** from each other.
- The front-end and the back-end can be developed **independently** from each other.

+ tech choosing

+ scalability

+ flexibility

+ maintainability

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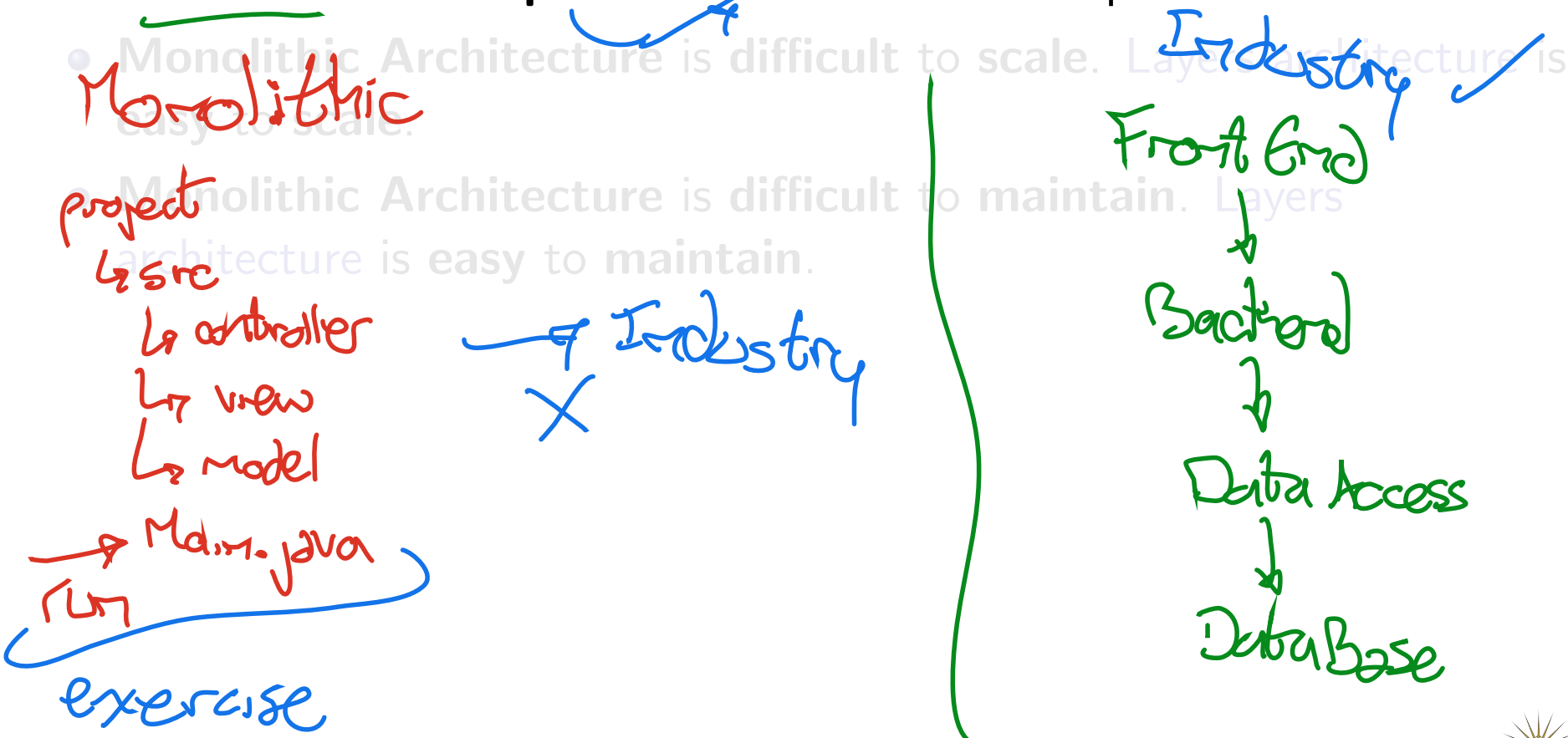
Prons and Cons

- **Monolithic Architecture** is **simple** and **easy** to develop. Layers architecture is **complex** and **difficult** to develop.
- Monolithic Architecture is **difficult** to **scale**. Layers architecture is **easy** to **scale**.
- Monolithic Architecture is **difficult** to **maintain**. Layers architecture is **easy** to **maintain**.



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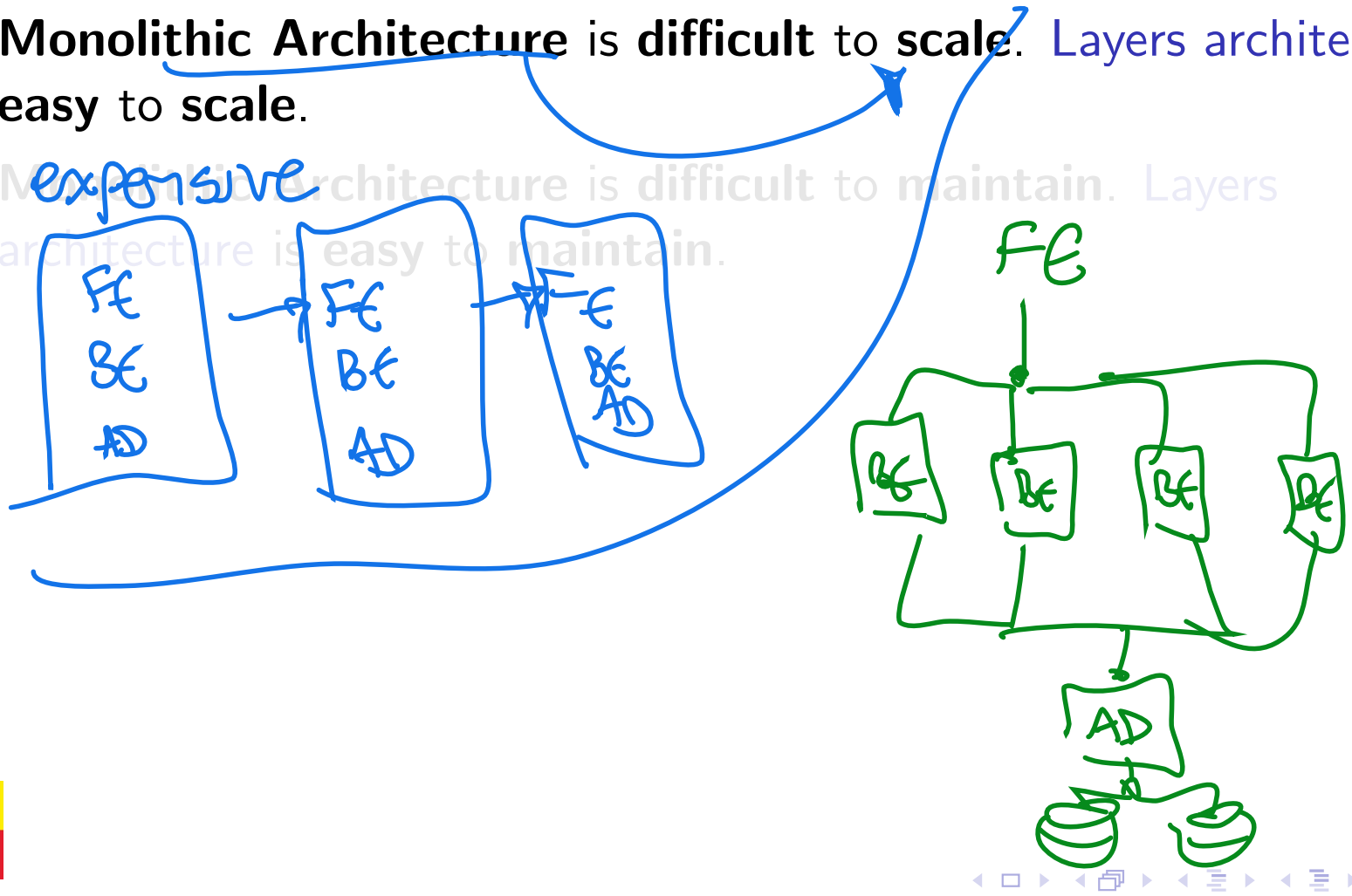

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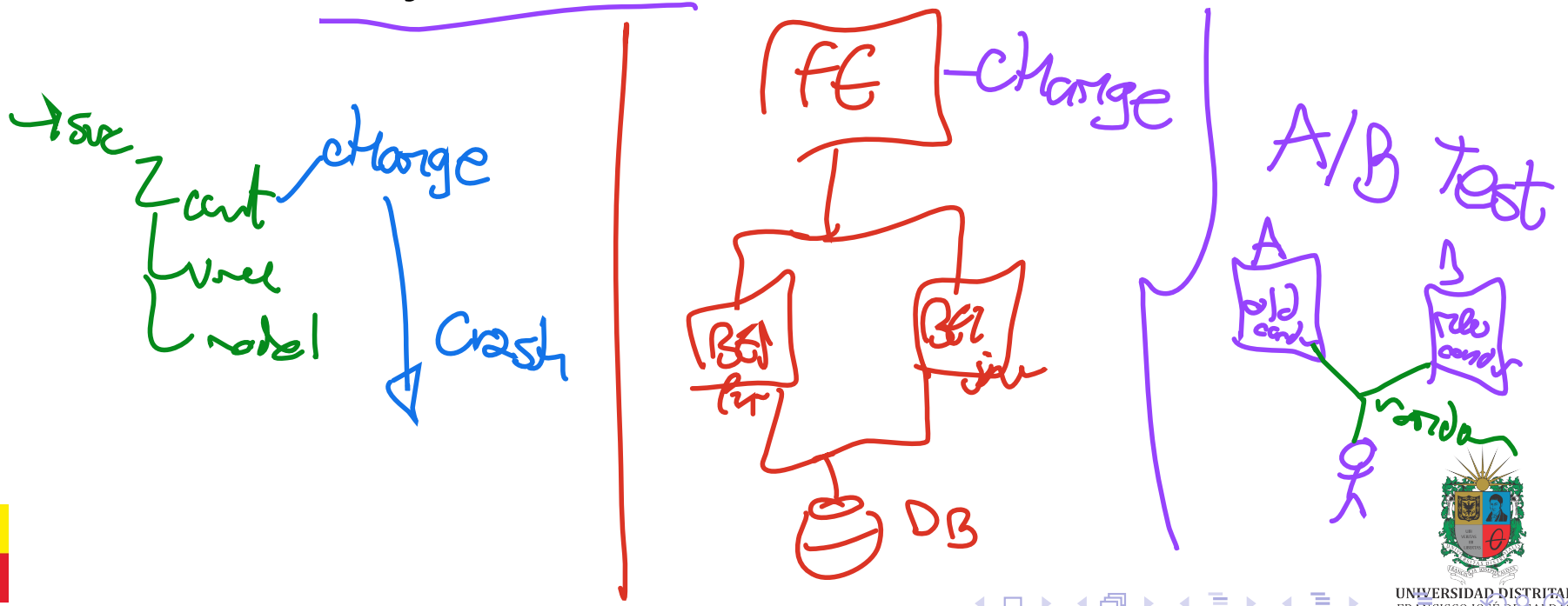
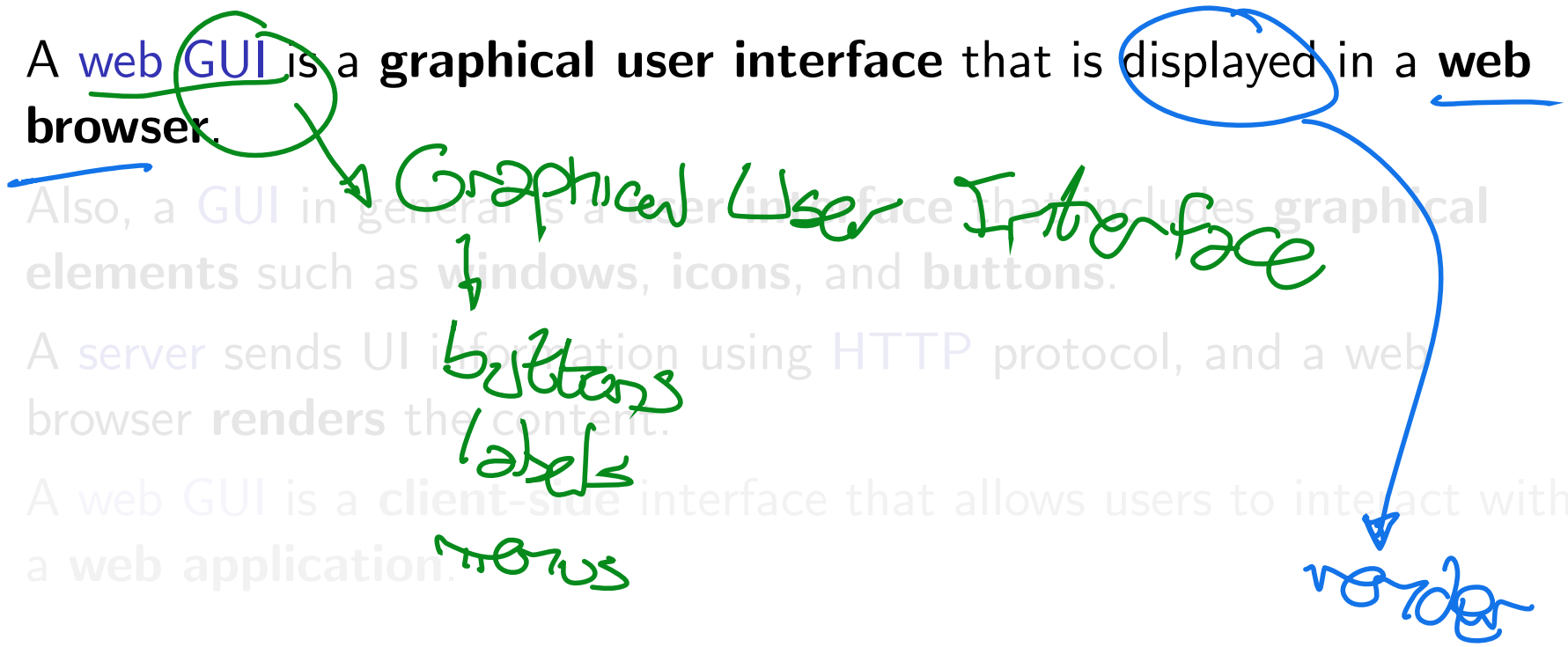


Outline

What is a web GUI?

- A web GUI is a **graphical user interface** that is displayed in a **web browser**.
- Also, a GUI in general is a **user interface** that includes **graphical elements** such as **windows**, **icons**, and **buttons**.
- A server sends UI information using HTTP protocol, and a web browser **renders** the content.
- A web GUI is a **client-side** interface that allows users to interact with a **web application**.



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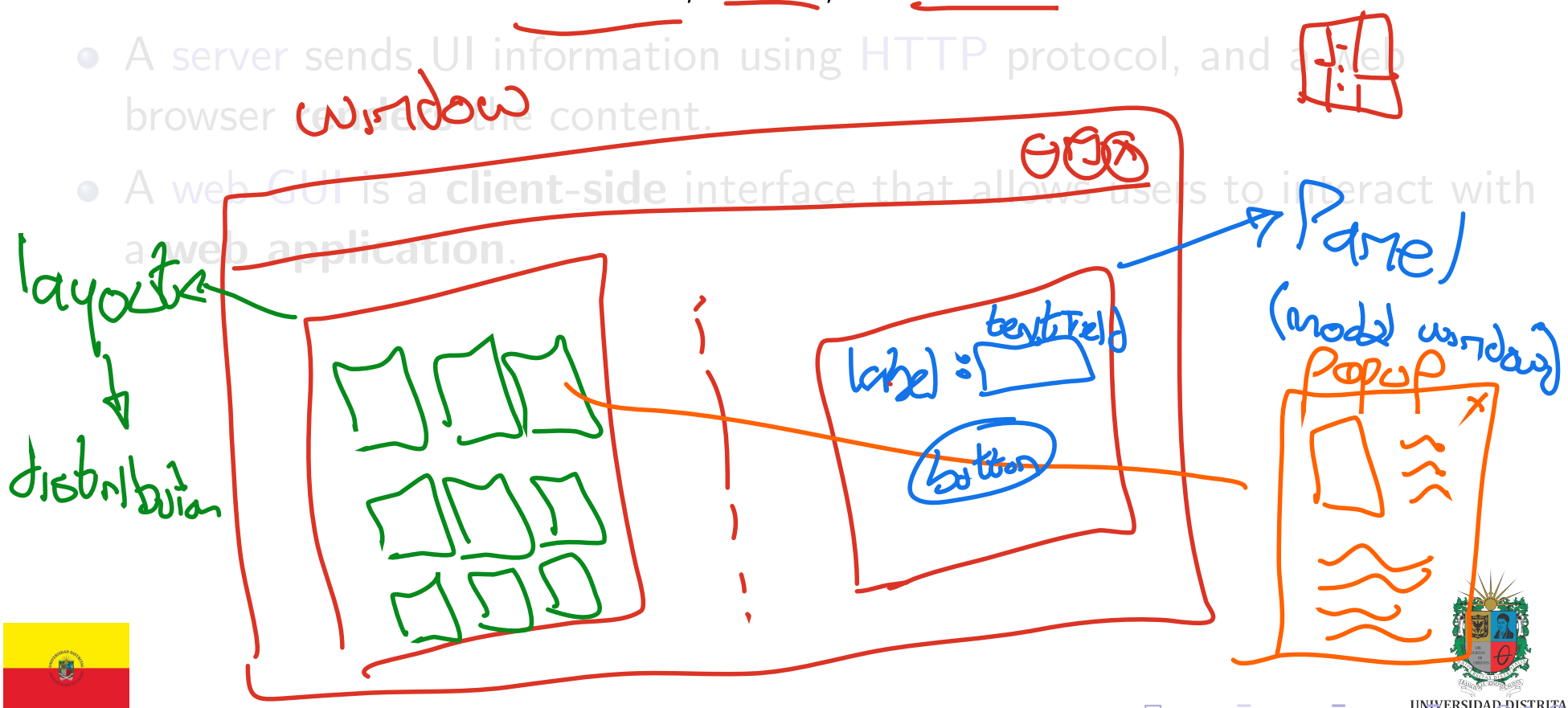

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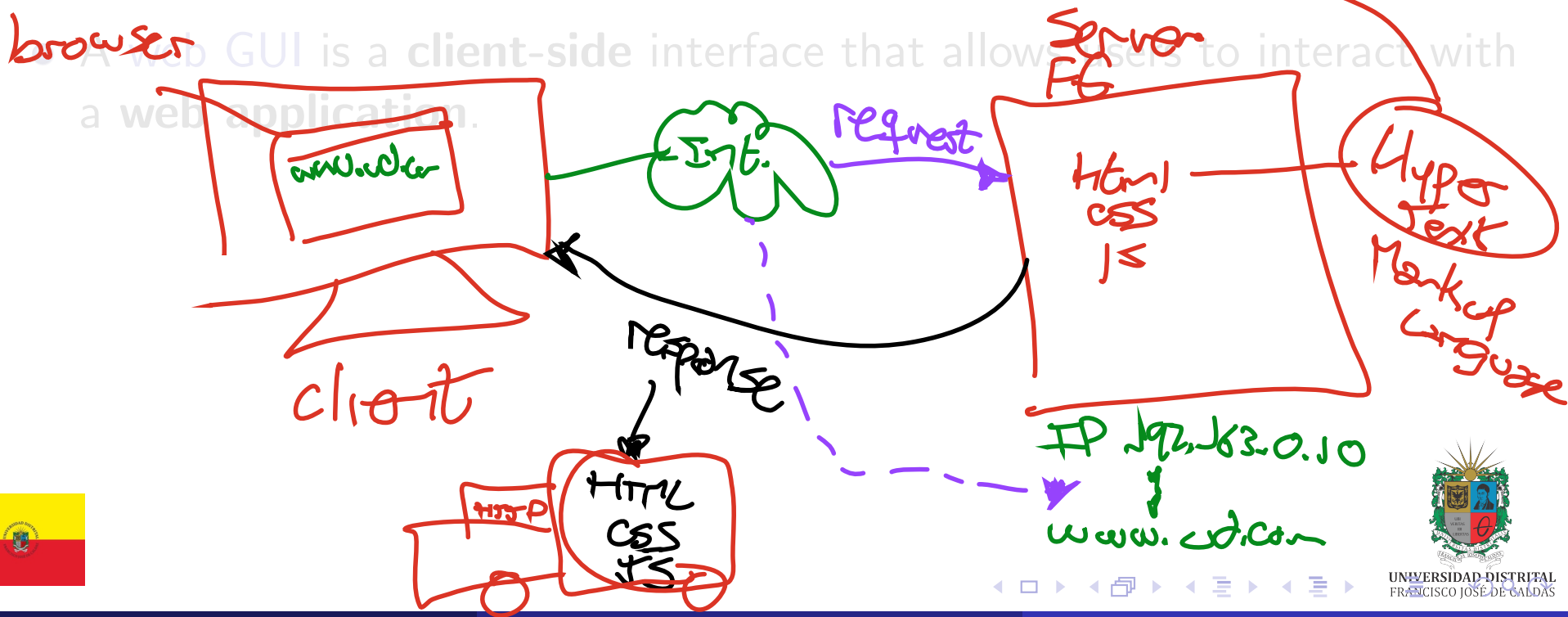

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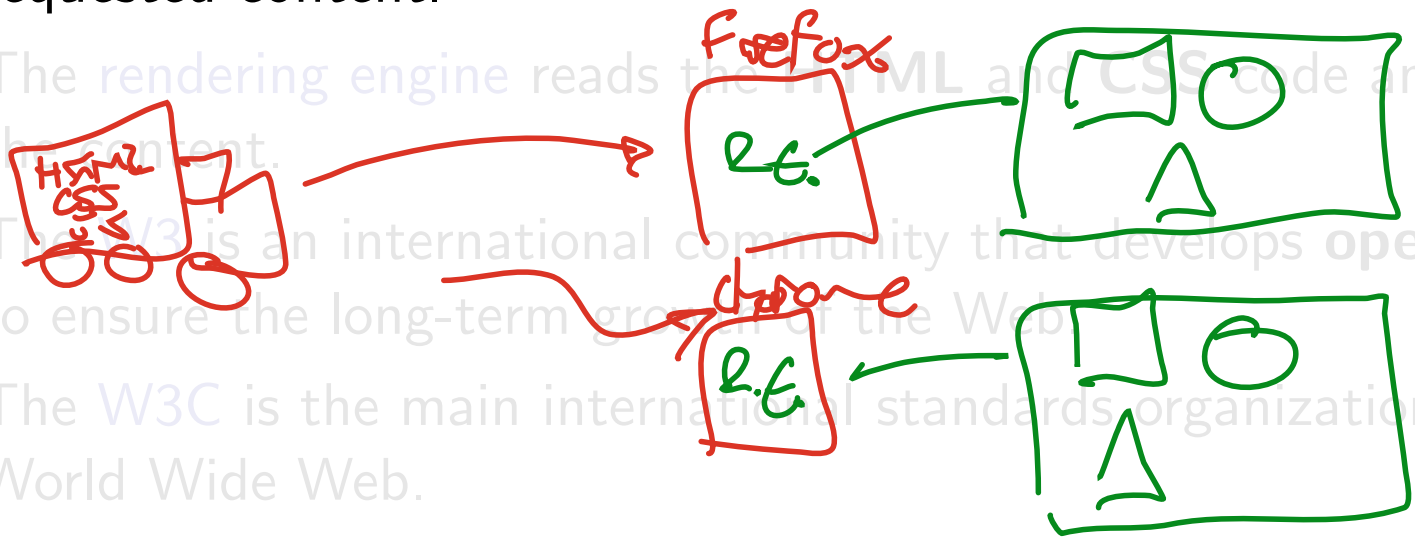
Render and Web Standards

- The rendering engine is a **software component** that displays the requested content.



- The rendering engine reads the **HTML** and **CSS** code and **renders** the content.
- The W3C is an international community that develops **open standards** to ensure the long-term growth of the Web.
- The W3C is the main international standards organization for the World Wide Web.

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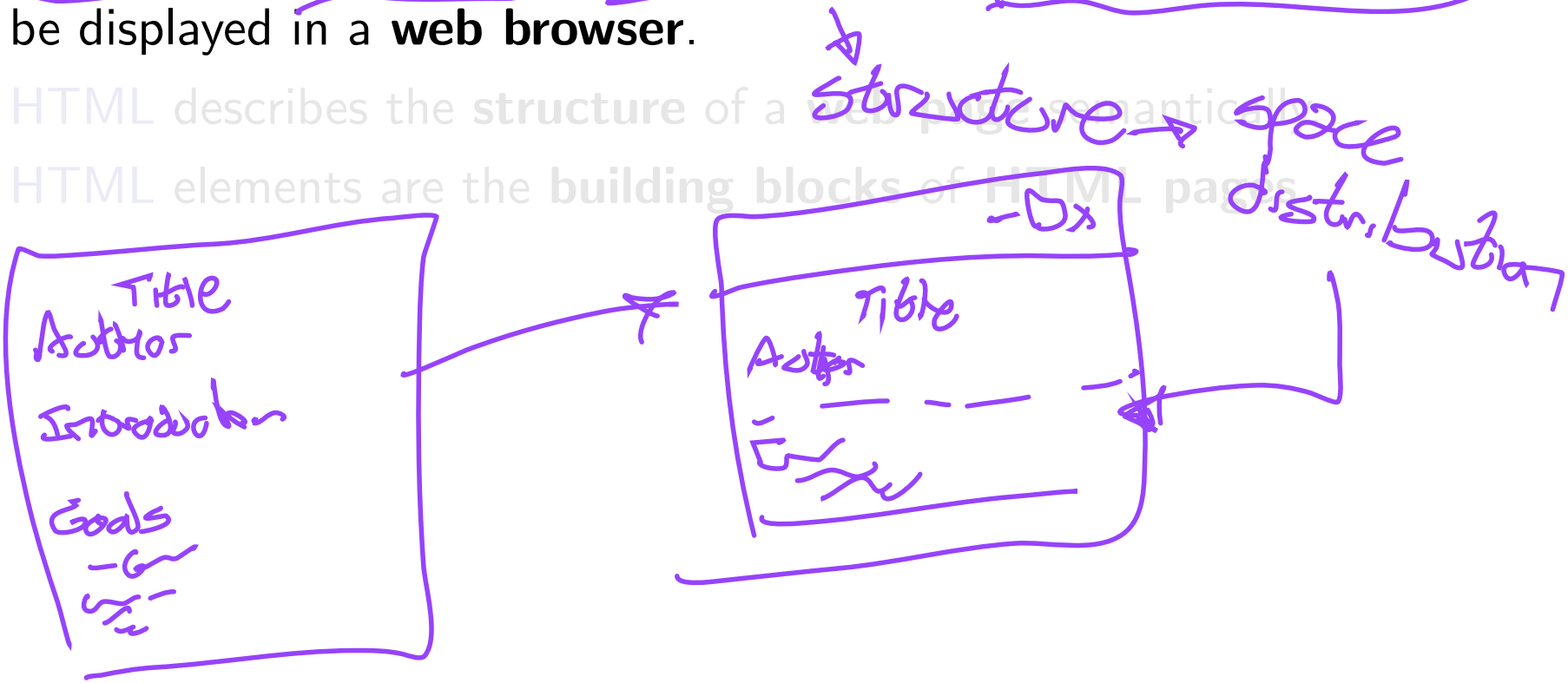

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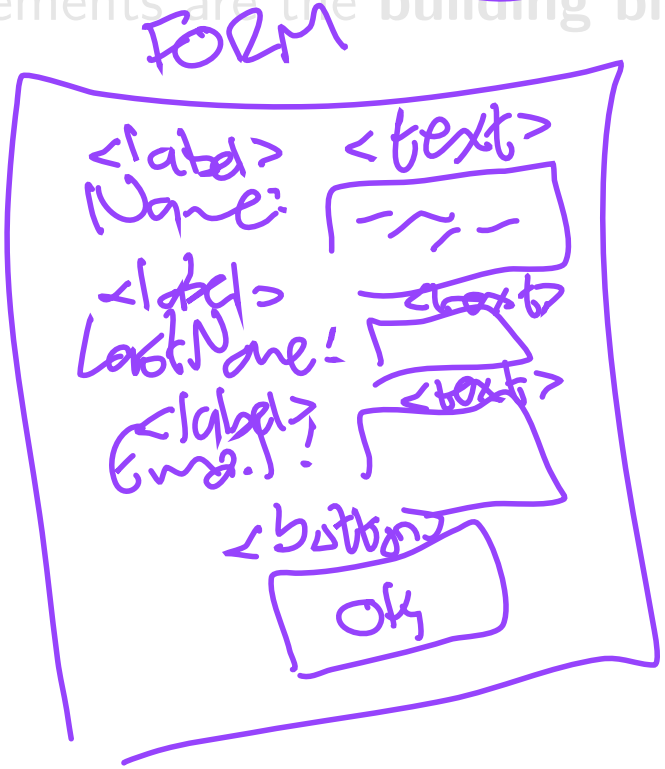

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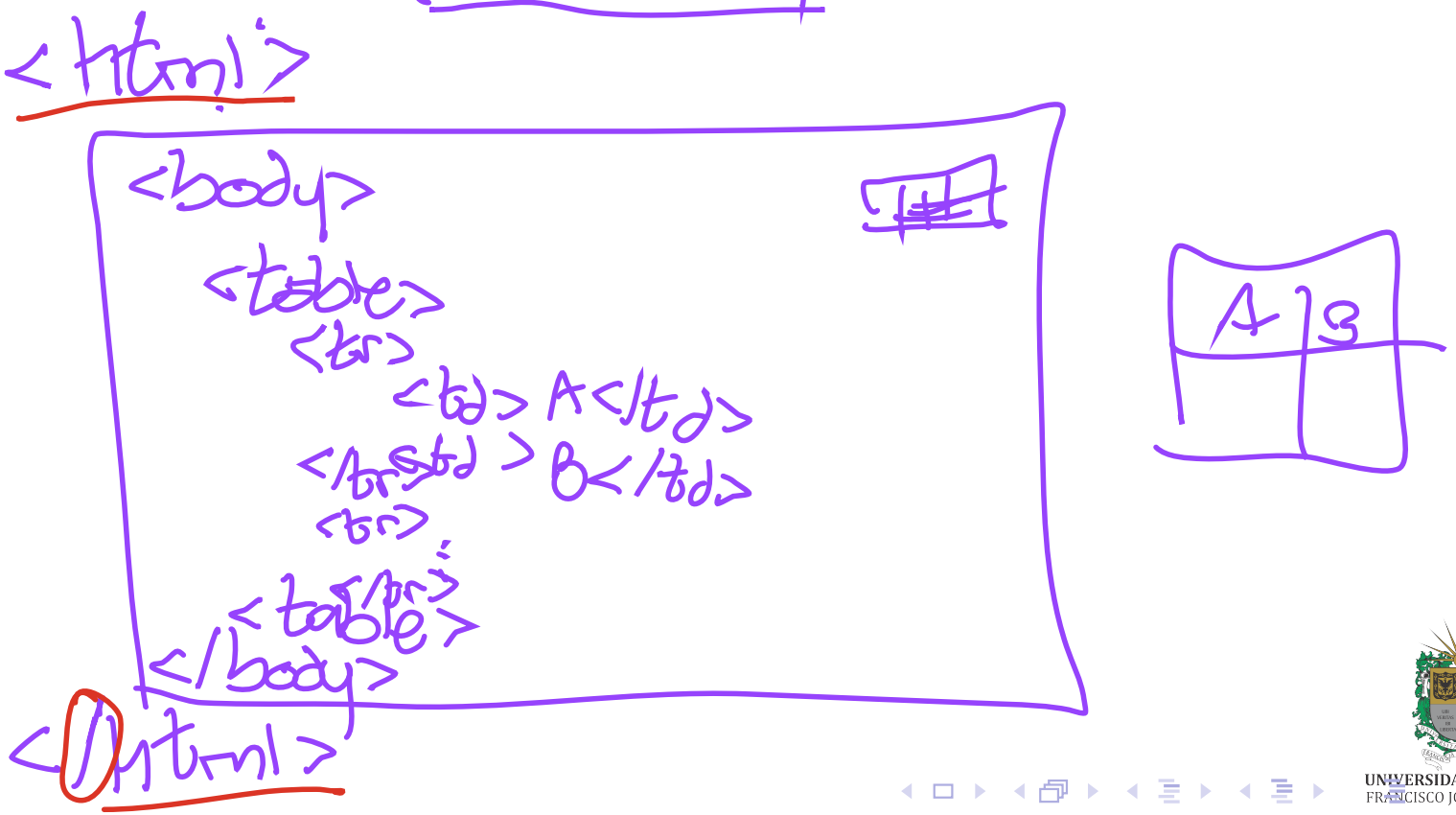

Cascading Style Sheets (CSS)

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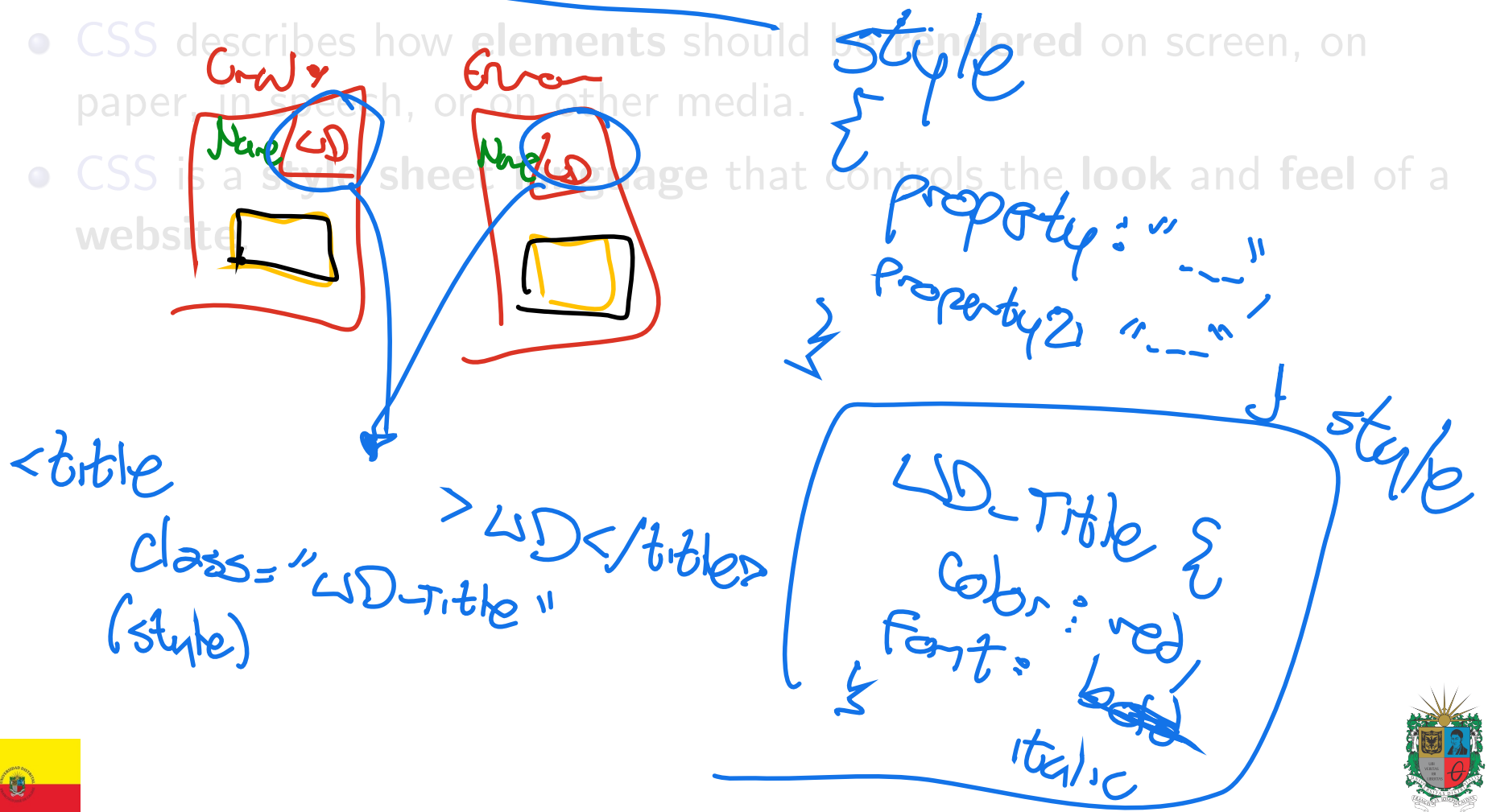
- CSS is a **style sheet language** that controls the **look** and **feel** of a **website**.



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HTML => what

CSS => how

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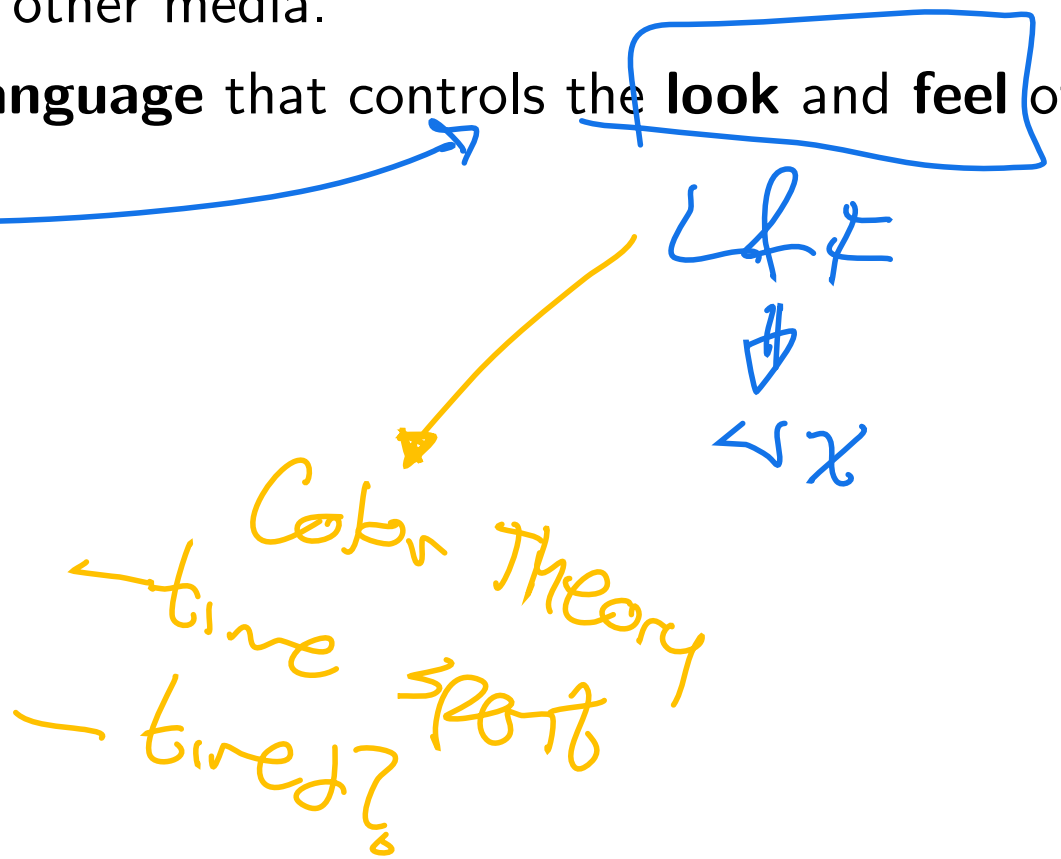

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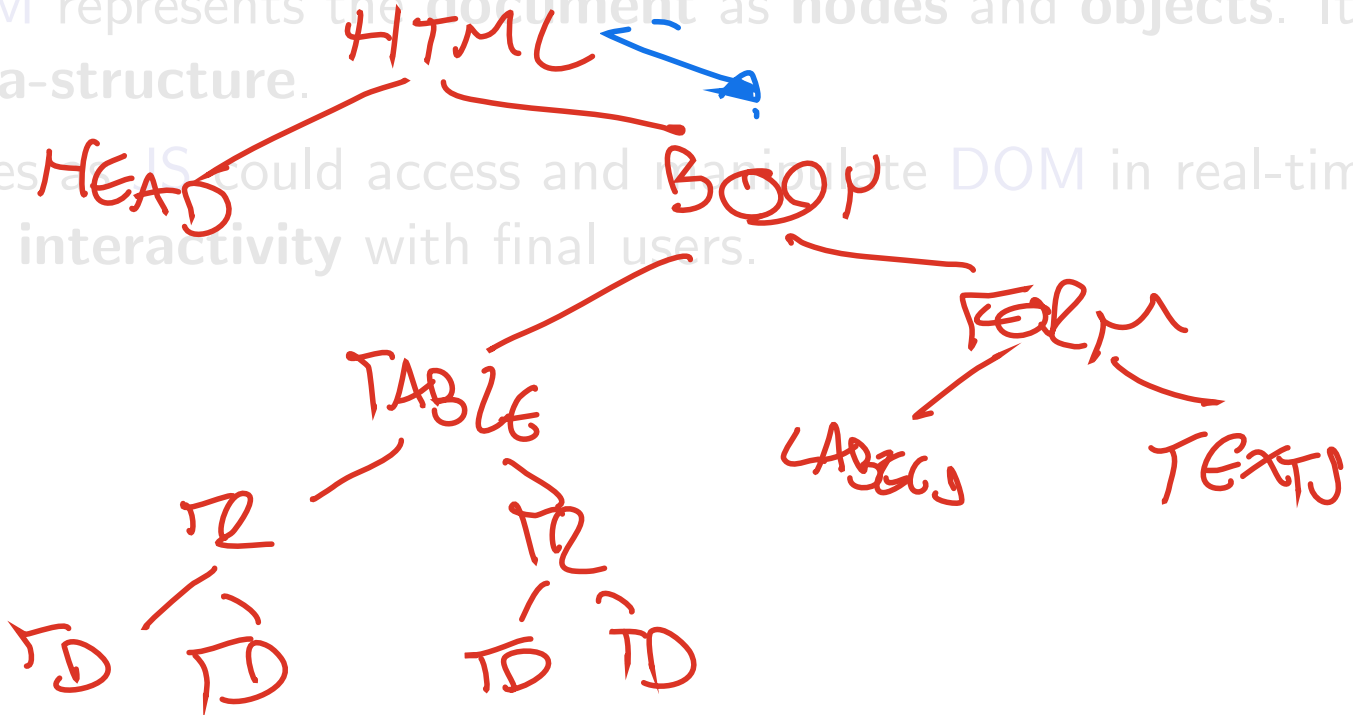
Document Object Model (DOM)

- The Document Object Model is a **cross-platform** and **language-independent** interface that treats an **XML** or **HTML** document as a **tree structure** where each **node** is an **object** representing a part of the document.
- The DOM represents the **document** as **nodes** and **objects**. It is a **tree data-structure**.
- Languages as JS could access and manipulate DOM in real-time. In increases **interactivity** with final users.



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JavaScript (JS)

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- It is a **multi-paradigm** language, supporting **object-oriented**, **imperative**, and **declarative** styles.
- JavaScript is a **client-side** language that allows **interactivity** with the **web page**.
- JavaScript is a **scripting language** that allows you to **create dynamically updating content**, **control multimedia**, **animate images**, and much more.

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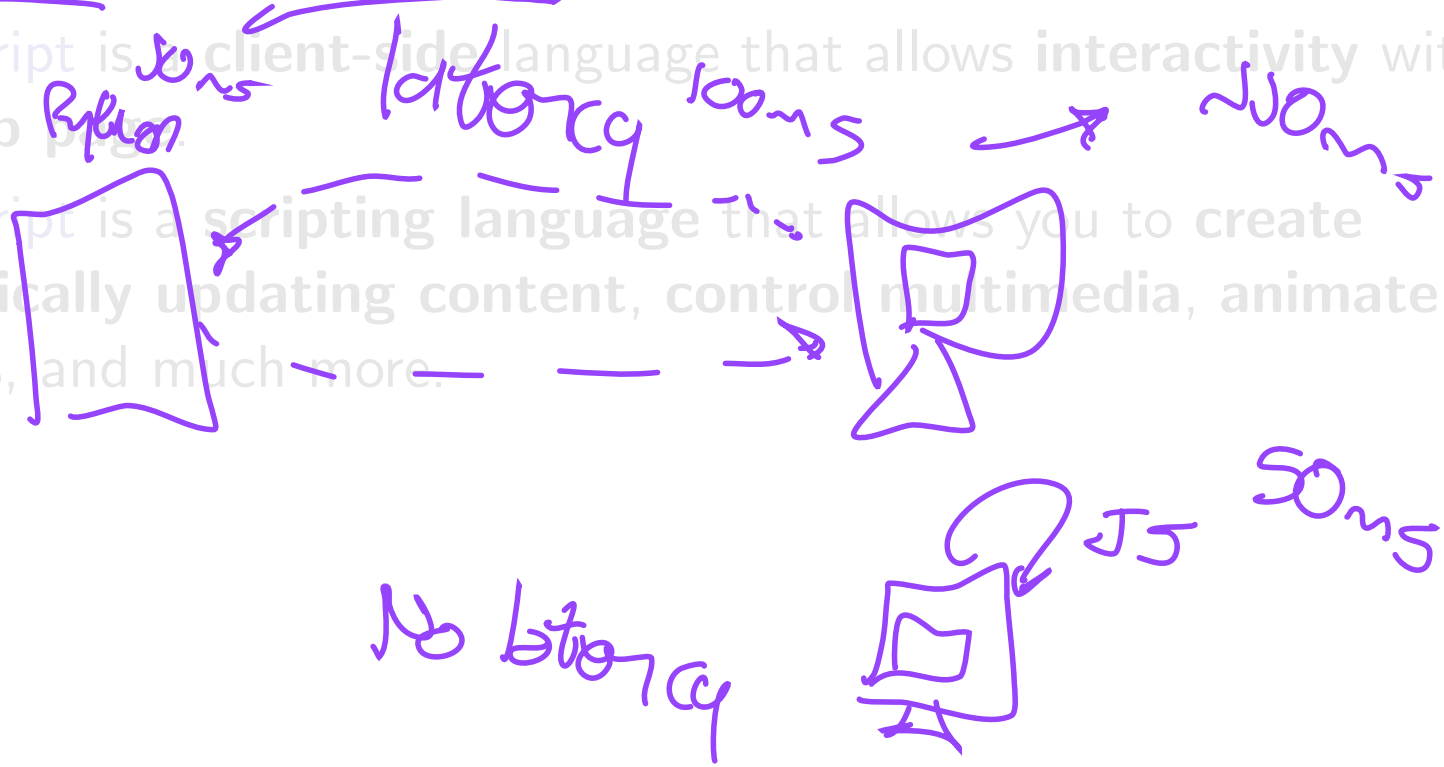

JavaScript (JS)

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web browser

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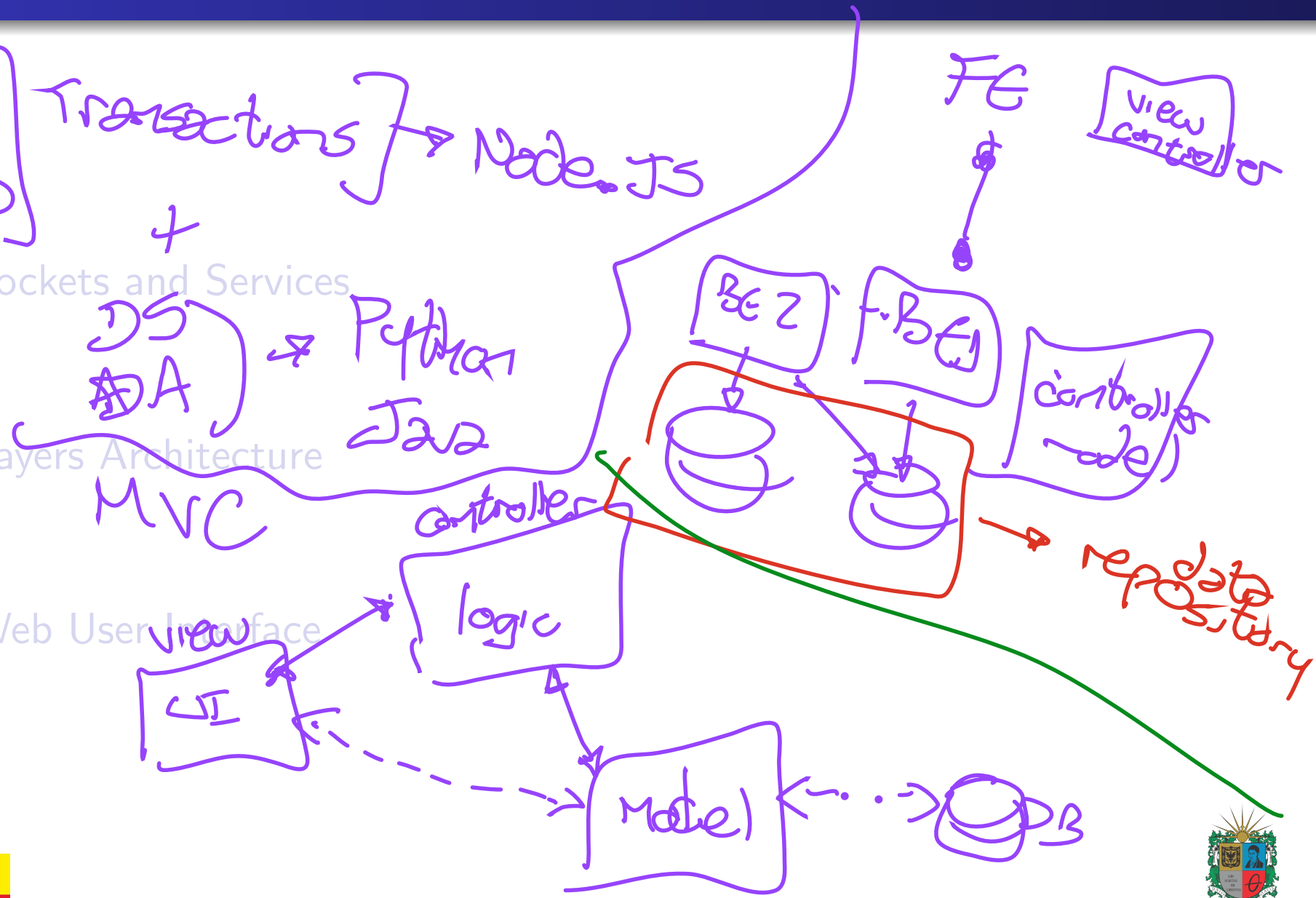
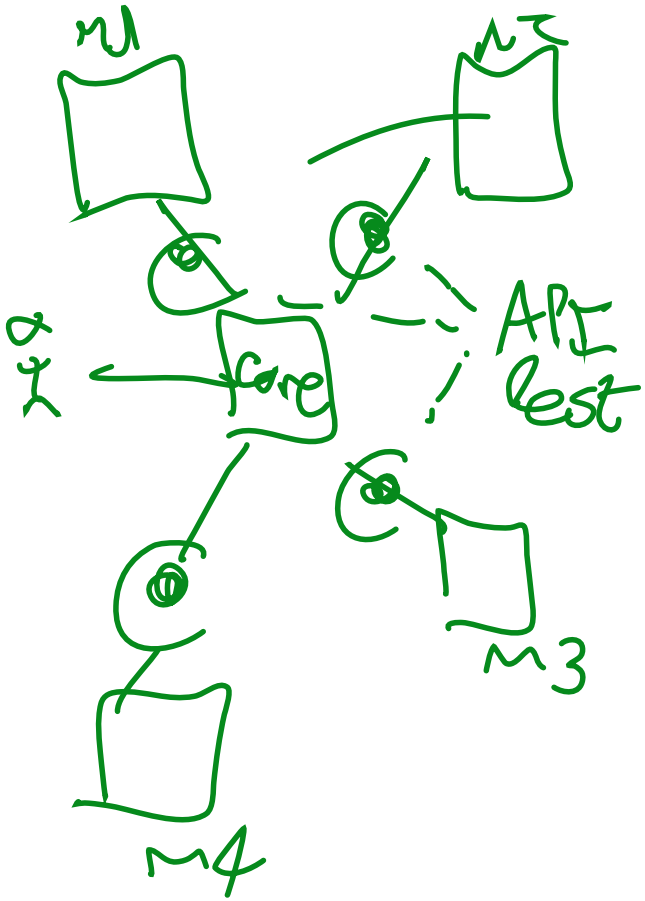
Outline





Thanks!

Questions?

Repo:
github.com/engandres/ud-public/tree/main/courses/advanced-programming