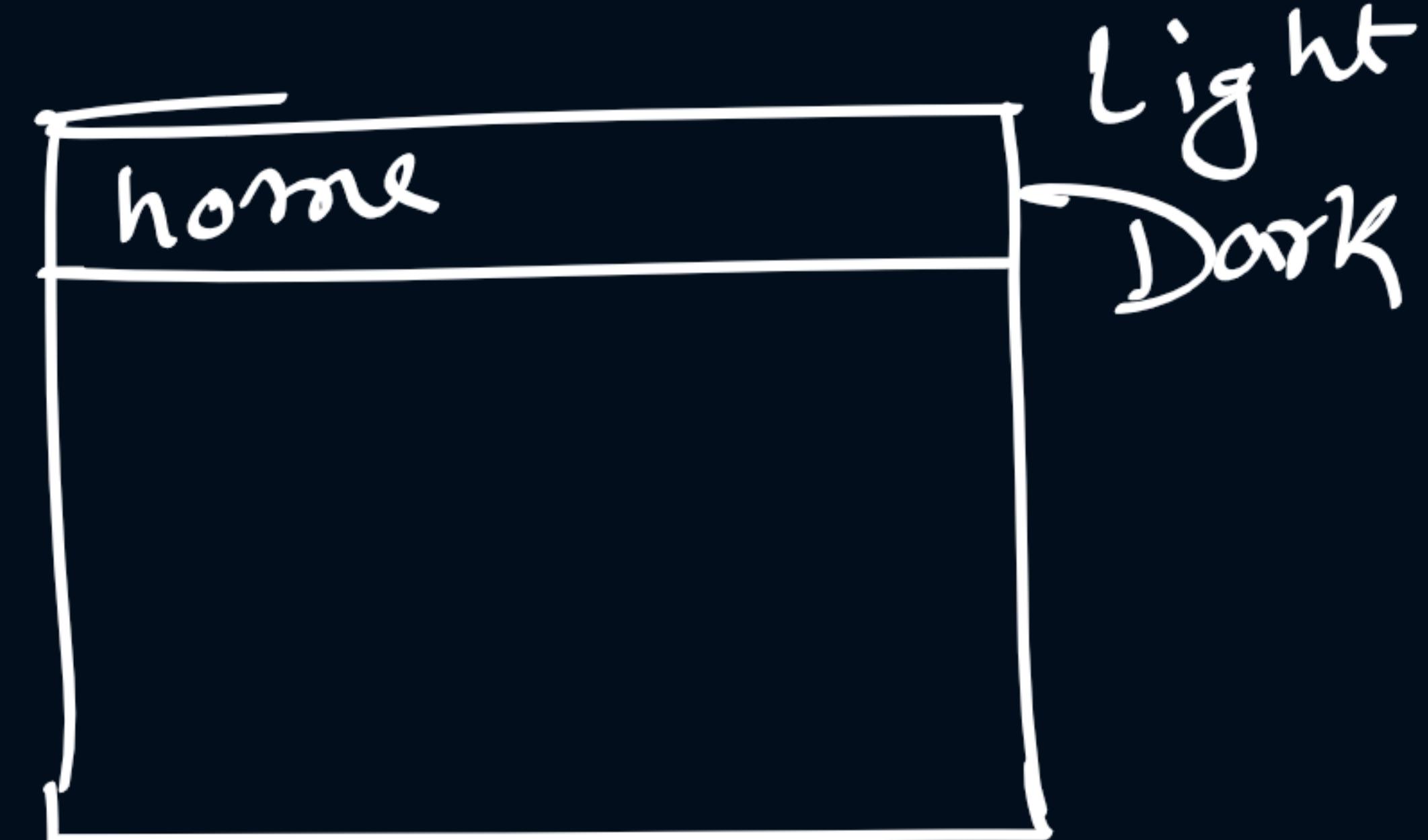


2 Jisan Anam Uniform Resource Locator



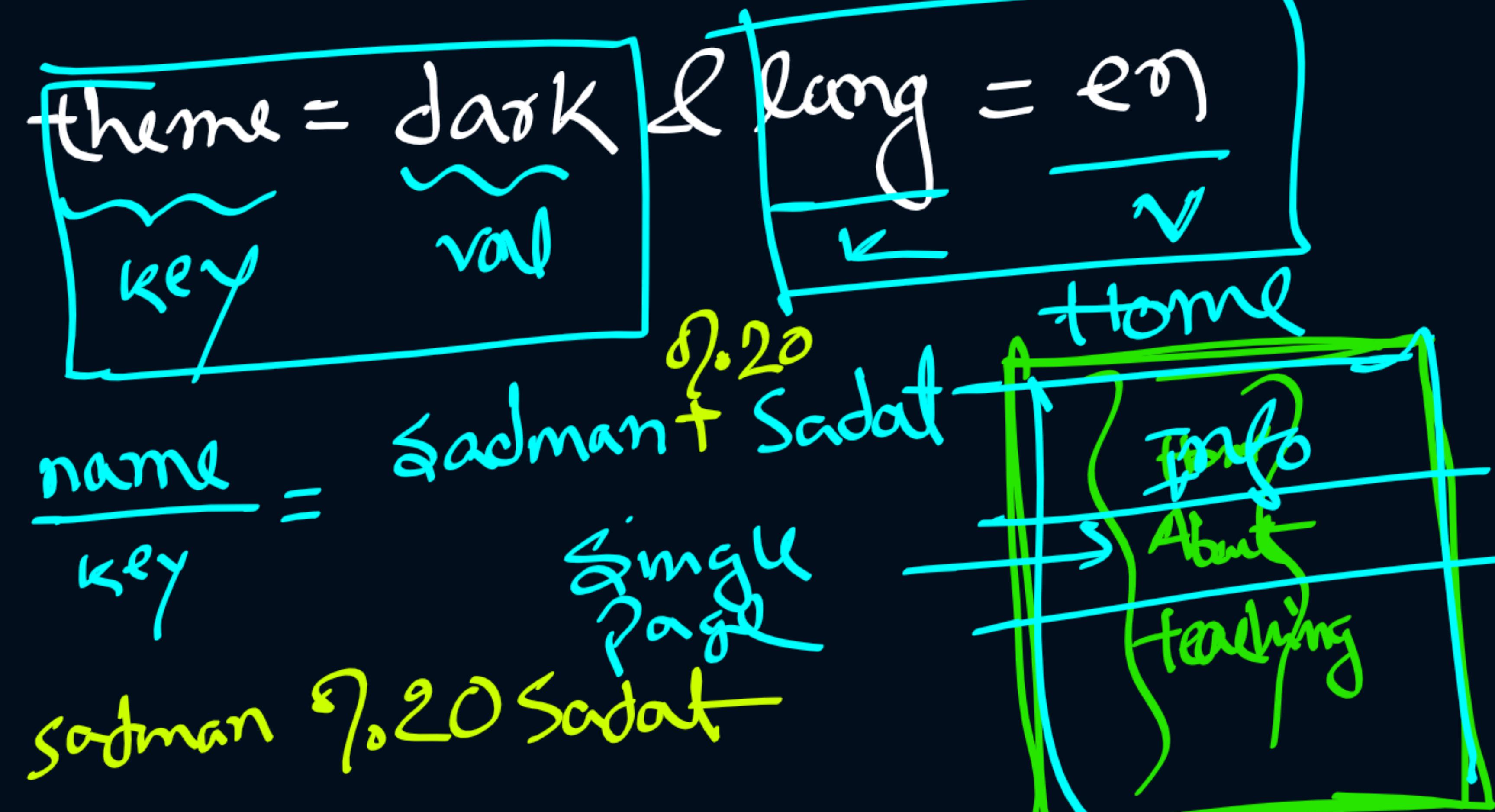
parameters



`www.swe4537.com/home`



(like a bookmark in a resource e.g., id of an element in an HTML document)



parses "key-value" pairs to the server.

key = value key = value ...

`www.something.com/home/#about`

fragments are not passed to the web server.

[space] → %20 or +
↳ Hexa-decimal value of [space]

& → %26
+ → %2B

$$A = \frac{65}{91}$$

Introduction to Javascript

TRACE HTTP/1.1
Host: facebook.com

HTTP/1.1 200 OK
Content -
!

TRACE HTTP/1.1
Host : facebook.com

LiveScript

html

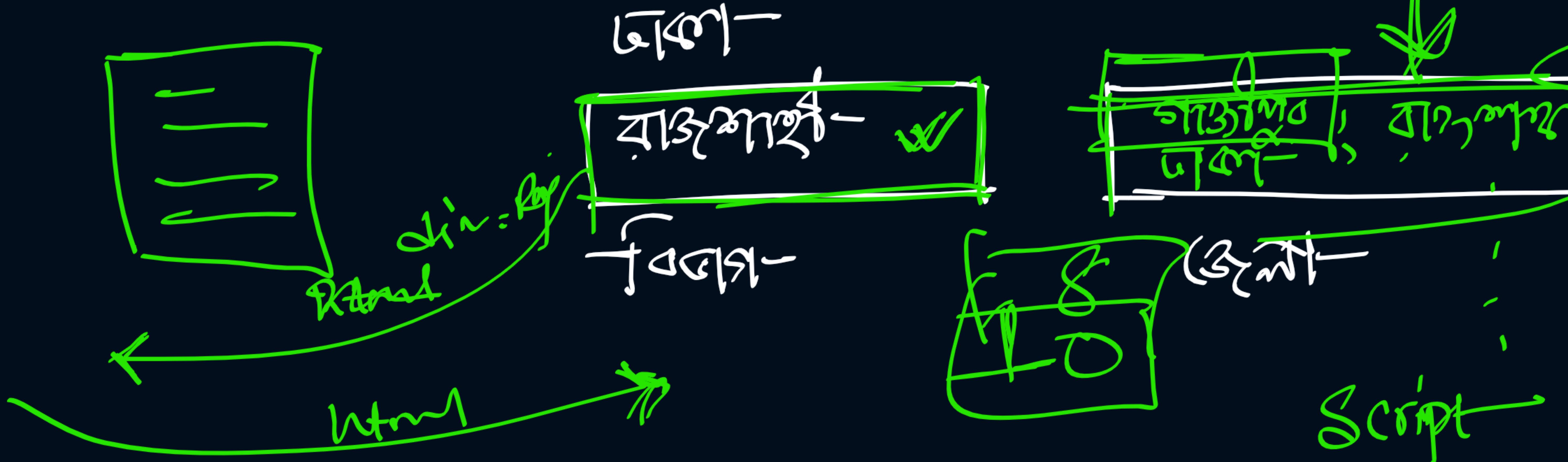
To make websites live

- what is JavaScript?
- why is it called JavaScript?
- JavaScript Engine ...?

We are skipping in-browser JavaScripts.

Server-side JavaScript is the main concern of this course.

Car
Carpet



Coding with JavaScript

- Comments
- variables (let)
- constants (const)
- Naming convention
- Data Types
- Type Conversion

~~var~~ let a = 5;
const b = 2; VS code
Prettier

Floating Point
Integer
Infinity
Neg. Infinity
NaN

Number
Big Integer

String
Boolean

null
Undefined

Object
Symbol

Primitive

true
false

Non-primitive

const WHITE = "#fffff";
const name = " - - - - -";

[1/0]

+ve divided by 0 = Infinity

JSON: JavaScript Object Notation

~~typeof()~~

In

String()

let a = 5;
a.toString();

Left → Right

let ans = 1 + 5;

int

string

6

let ans = '1' + 5;

string

'15'

API Call

let a;

let a = getPosts();

let a = null;

$$\begin{array}{c}
 '1' + '5' + 2 \\
 (1 + 2) + 3 \\
 = 3
 \end{array}$$

$$\frac{(2+2)}{4 / '2'} = 2$$

JSON

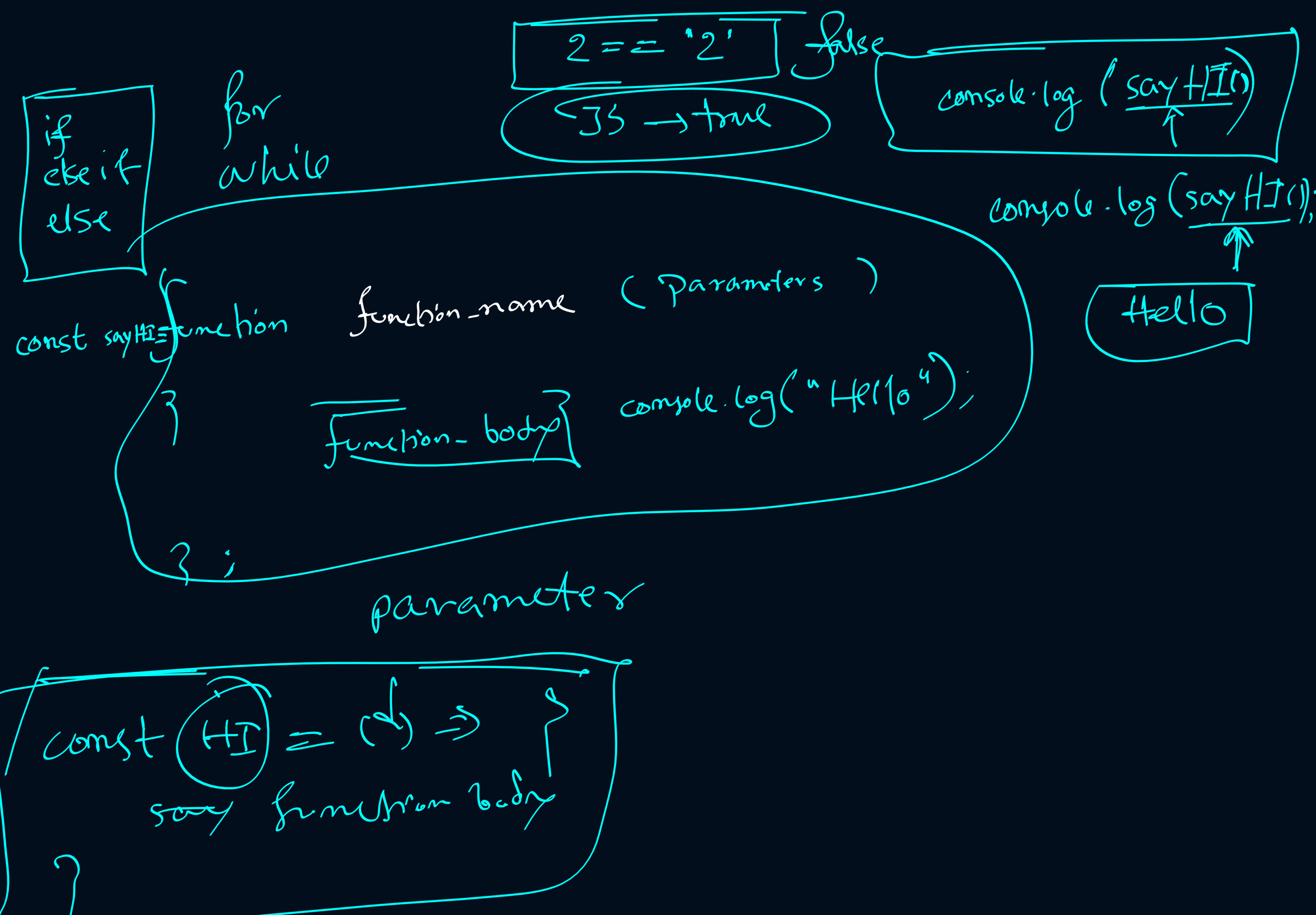
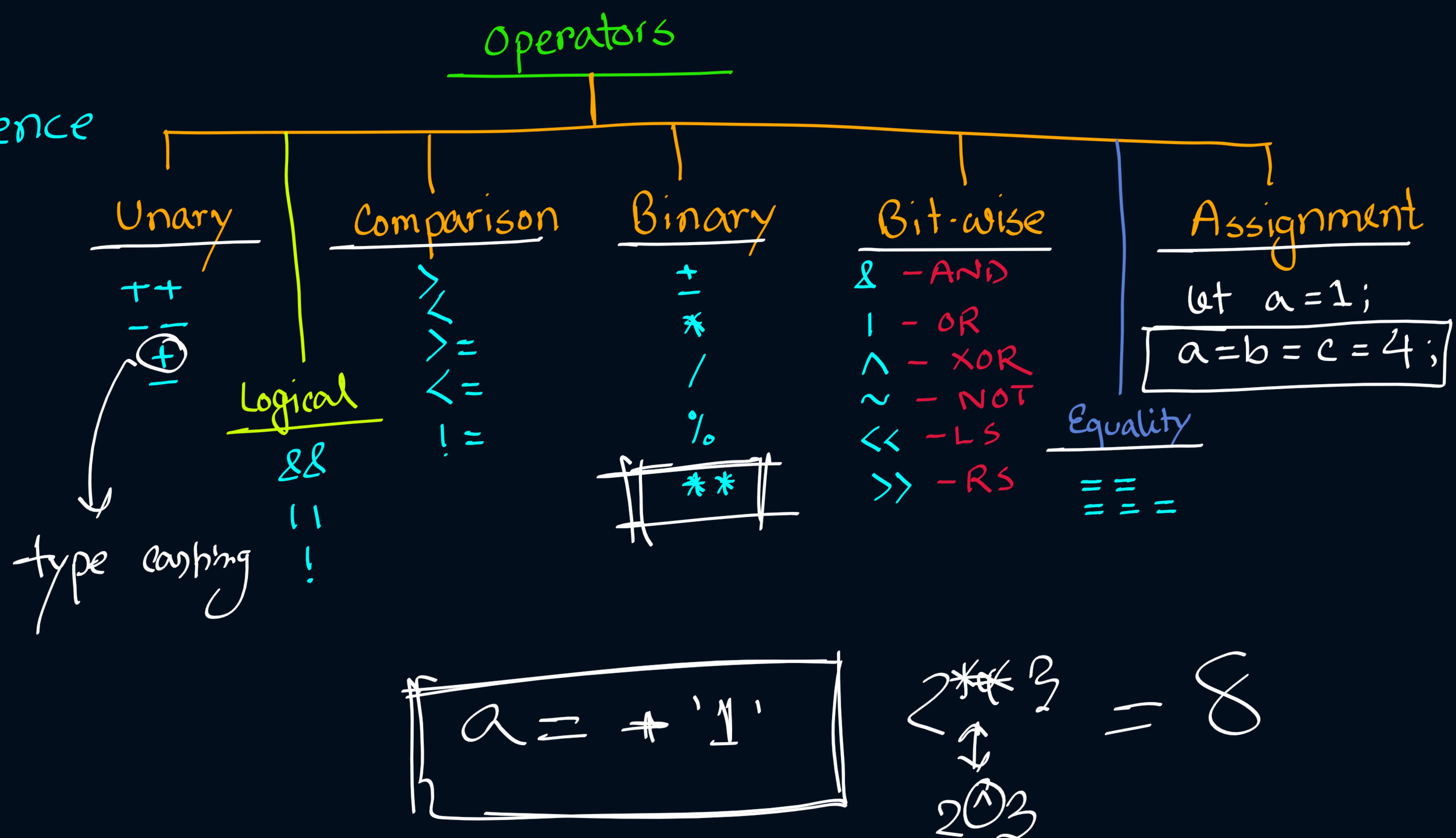
let a; let a = null;

{ key: value , }

key must be string

Coding With JavaScript

- Operators
- Operator Precedence
- Assignment
- Comparisons
- Interactions X



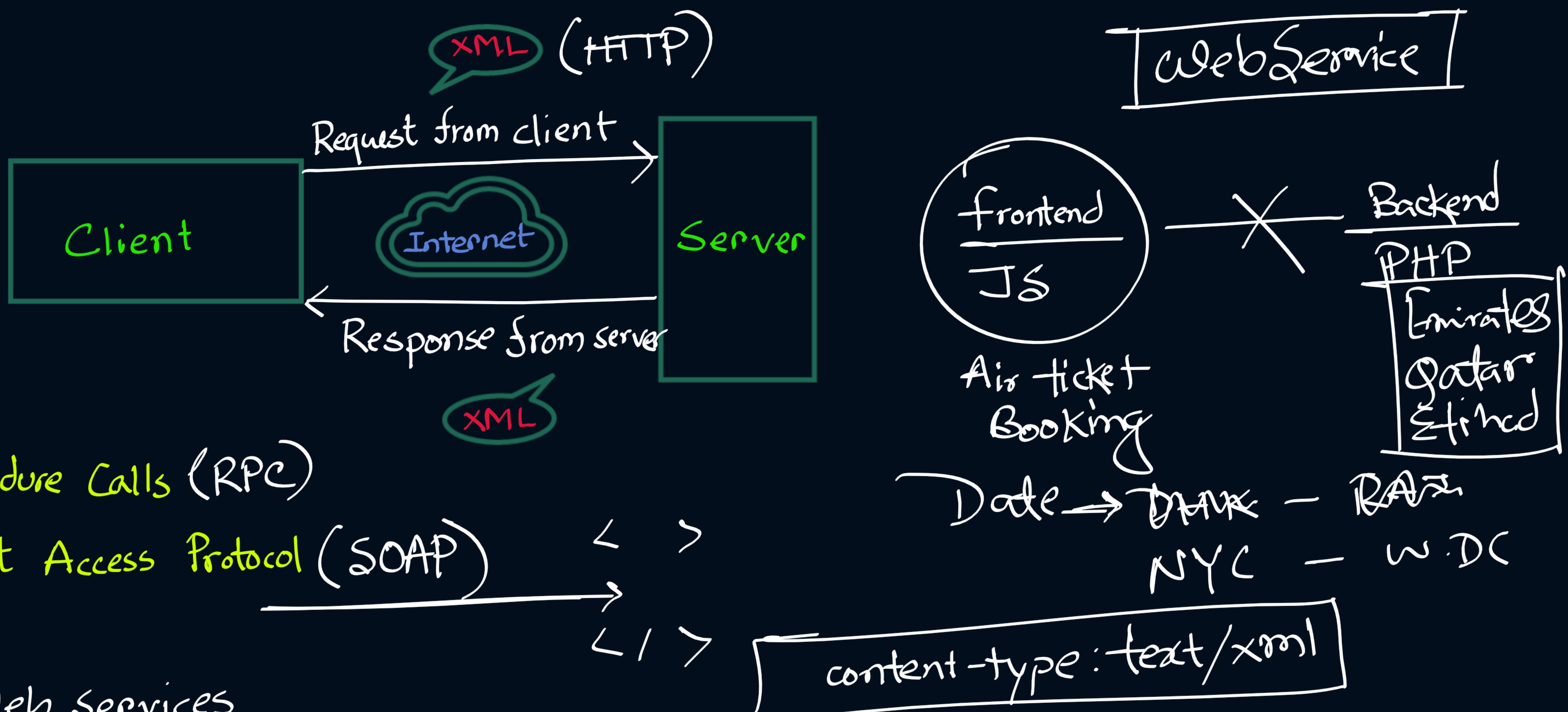
Coding with JavaScript

- conditional statement
- Logical Operators
- Loops
- Switch statement
- Functions

Lecture 4,5

Web Services

A standardized medium to propagate communication between client and server applications. A software module to perform certain sets of tasks.



Remote Procedure Calls (RPC)

Simple Object Access Protocol (SOAP)

Types of Web Services

1. SOAP Web Services

2. RESTful Web Services

- doesn't restrict content
- but document has to follow a specific pattern.

SOAP Message - Transport independent messaging protocol.

```
<Envelope>
<Header>
</Header>
<Body>
  <Body>
</Body>
</Envelope>
```

Web Services Description Language (WSDL)

```

<definitions>
  <message name="TutorialRequest">
    <part name="TutorialID" type="xsd:string"/>
  </message>

  <message name="TutorialResponse">
    <part name="TutorialName" type="xsd:string"/>
  </message>

  <portType name="Tutorial_PortType">
    <operation name="Tutorial">
      <input message="tns:TutorialRequest"/>
      <output message="tns:TutorialResponse"/>
    </operation>
  </portType>

  <binding name="Tutorial_Binding" type="tns:Tutorial_PortType">
    <soap:binding style="rpc"
      transport="http://schemas.xmlsoap.org/soap/http"/>
    <operation name="Tutorial">
      <soap:operation soapAction="Tutorial"/>
      <input>
        <soap:body
          encodingStyle="http://schemas.xmlsoap.org/soap/encoding/"
          namespace="urn:examples:Tutorialservice"
          use="encoded"/>
      </input>

      <output>
        <soap:body
          encodingStyle="http://schemas.xmlsoap.org/soap/encoding/"
          namespace="urn:examples:Tutorialservice"
          use="encoded"/>
      </output>
    </operation>
  </binding>
</definitions>

```

input
output

XML

message - data elements for each operation

Binding - protocol

Body
XML

SOAP
WSDL
UDDI

Universal Description,
Discovery and Integration
(UDDI)

Advantages of Web Services


Web Services Architecture

1. Exposing Business functionality on the network

2. Interoperability amongst applications.

3. Standardized protocol which every body understands.

4. Reduction in cost of communication.



Characteristics

OS, Network, Platform

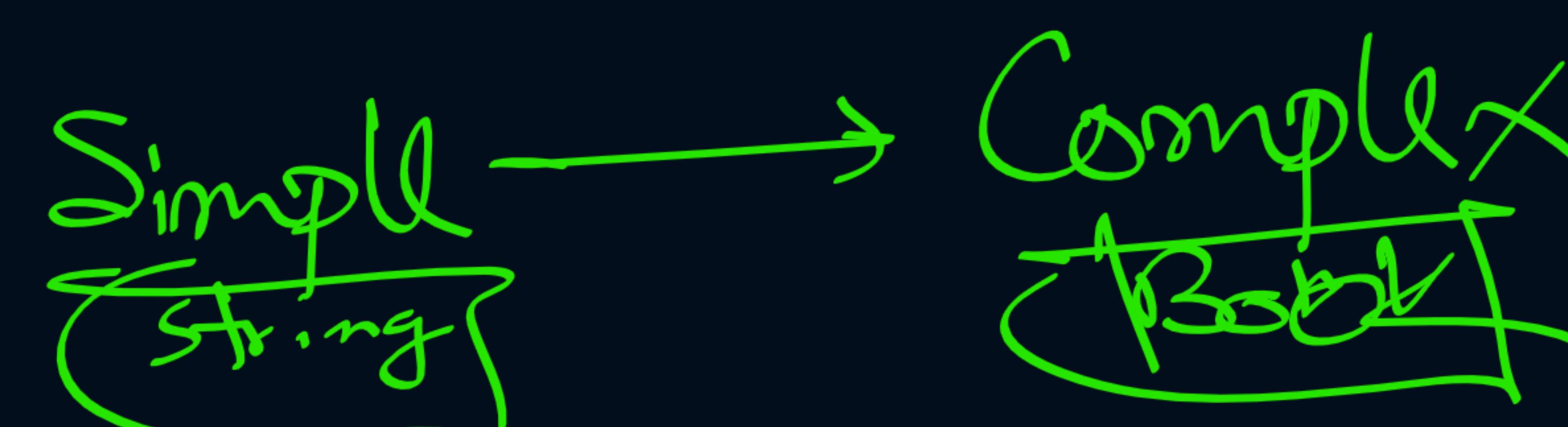
XML Based - eliminates dependency

Loosely Coupled -

Synchronous or Asynchronous functionality

Ability to support RPC

Supports Document Exchange -



Protocol Stack

Service Transport - responsible for transporting messages. HTTP, SMTP, FTP, BEEP

XML Messaging - encodes message in a common XML format.

Service Description - for describing the public interface (WSDL)

Service Discovery - for centralizing services into a common registry and providing easy publish/find functionality. (UDDI)

RESTful Web Services

Representational State Transfer

what is REST?

Service Exposure

Bandwidth

Data format → XML

JSON

Resource

access, manipulate

~~RPC
SOAP~~

XML
WSDL
RPC ↑

Rules of REST

1. Noun - endpoint / Resource
2. Request using HTTP Action Verb
3. Plural of resources
4. HTTP Response Code
- 5.

Differences between SOAP and REST

→ Soap follows strict guideline / pattern → Protocol.

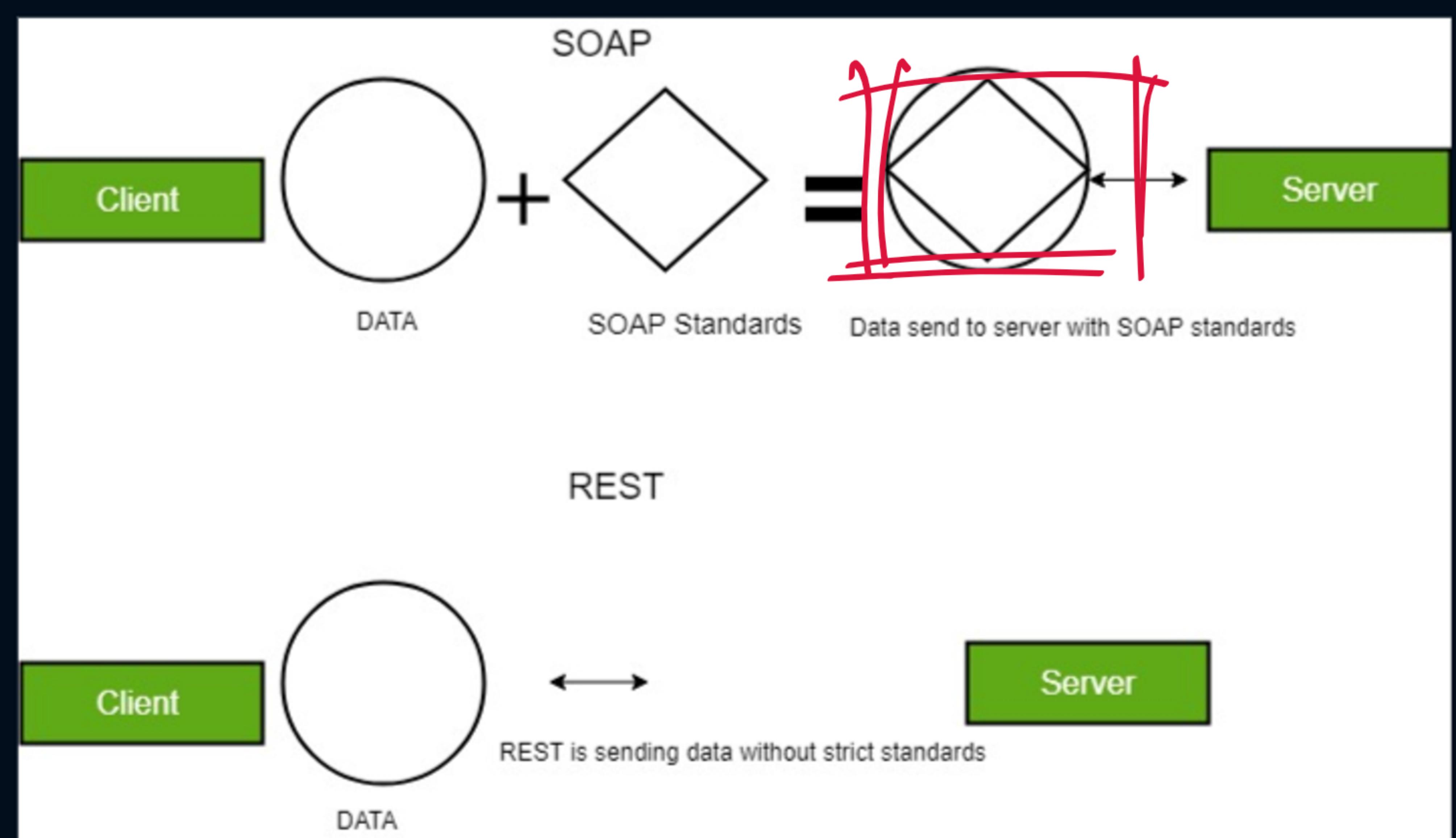
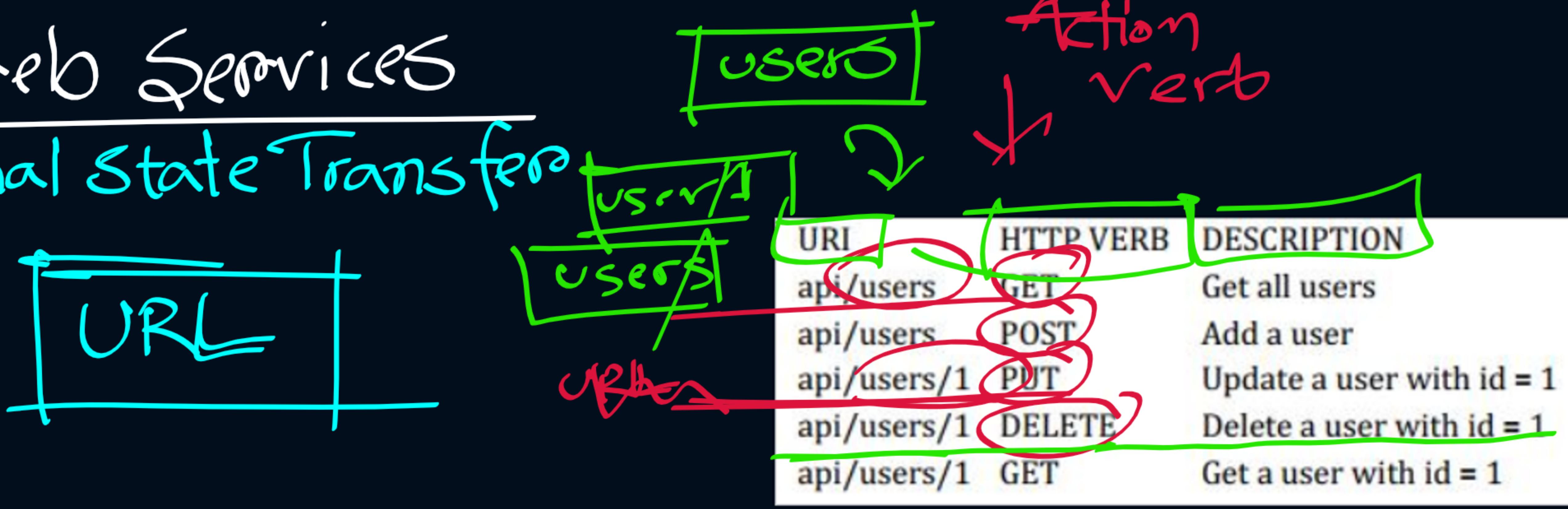
→ Soap uses XML, REST — XML, JSON

→ RPC, Just URL is enough REST

→ SOAP is difficult to implement
→ SOAP requires more Bandwidth

→ It is easier to perform transaction using SOAP.

Bank A/c, Password, Card No. → SOAP is Preferred



Lecture 6

Definition

Application Programming Interface (API) is a software intermediary that allows two applications to talk to each other.

World Wide Web Consortium

[W3C] Web services provide a standard means of operating between different software applications over a network running on a variety of platforms and/or frameworks.

Internet/organizational level

Need of Network

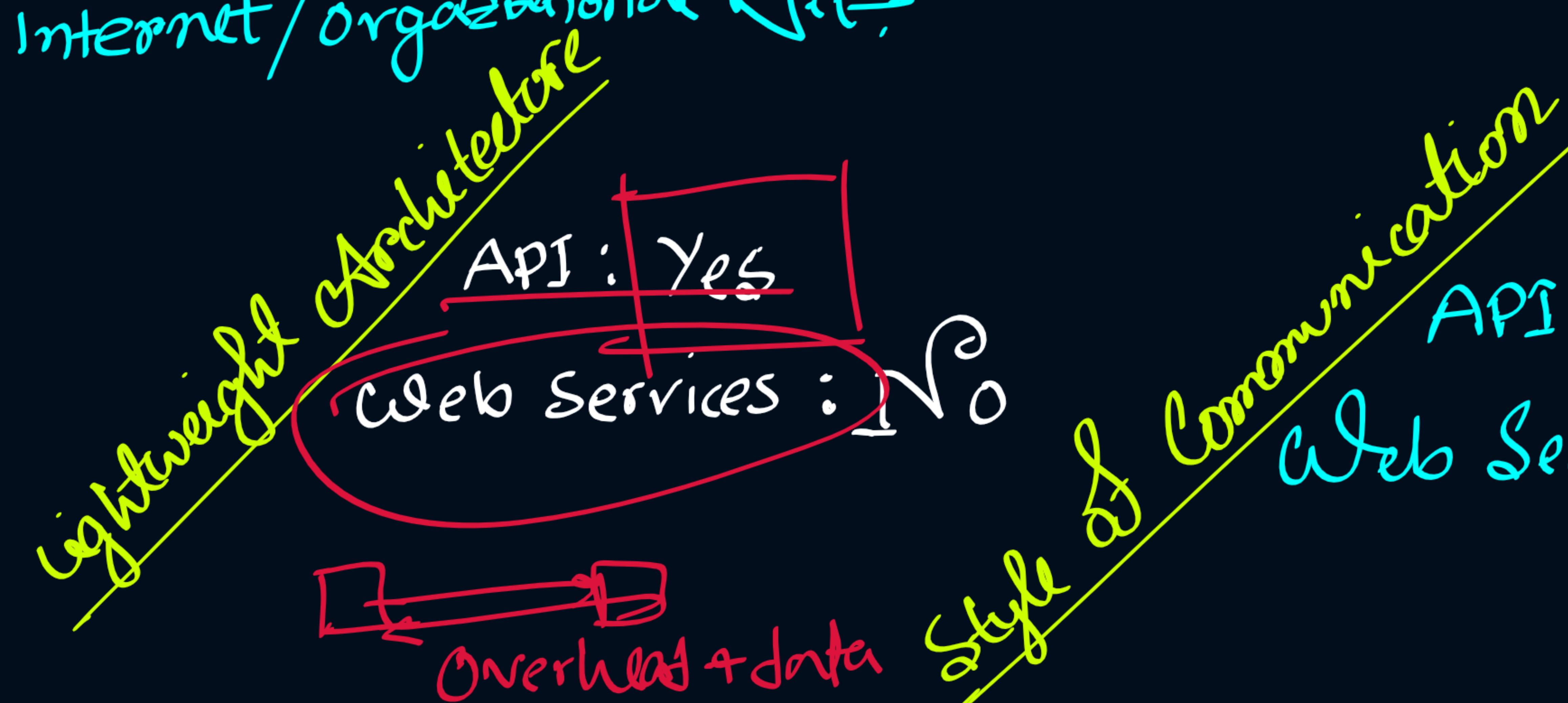
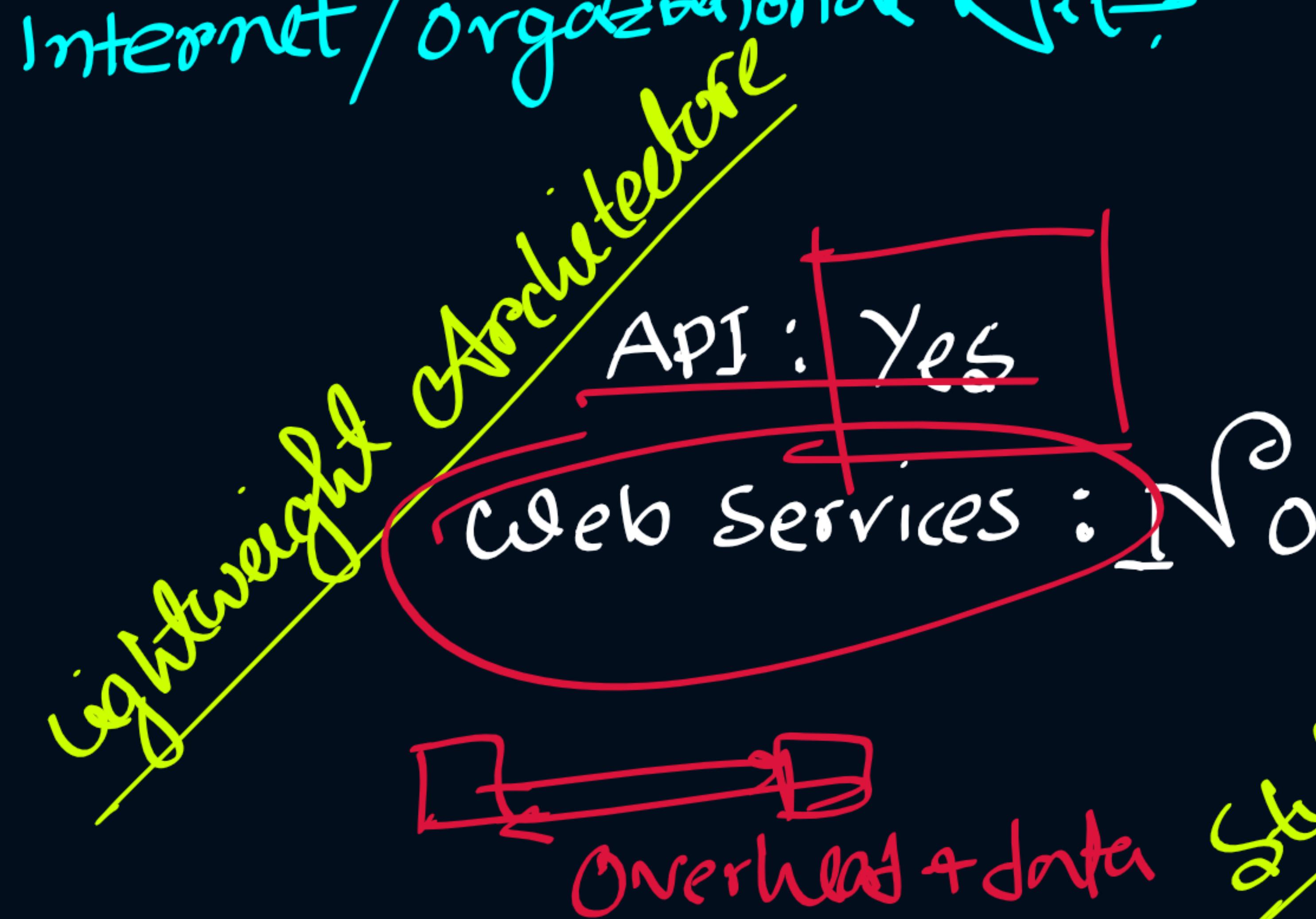
API - Not always.

Web Services - Always.

Protocol restriction

API - Web API → HTTP.

Web Services - HTTP

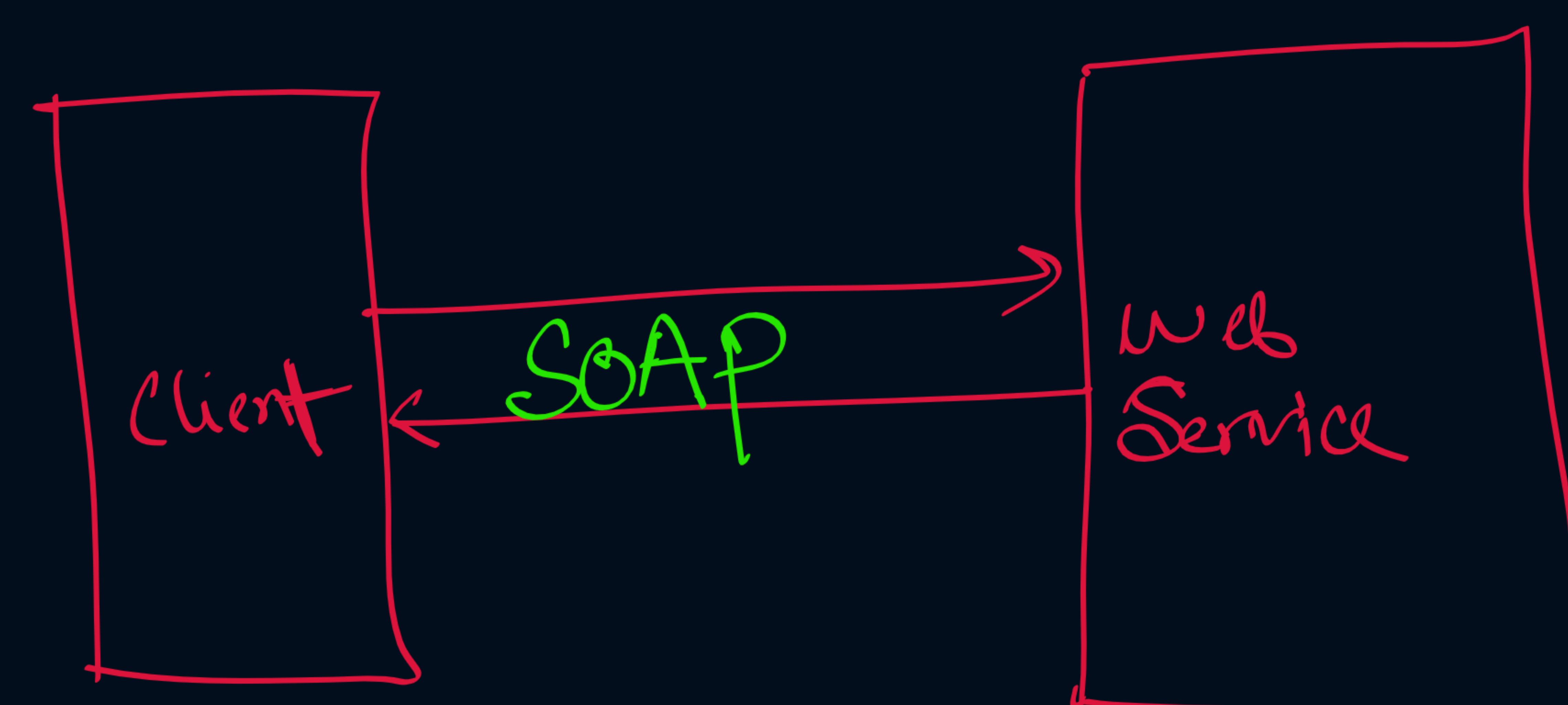


Open Source

API - Yes (mostly)

Web Services - Mostly No

All web services are APIs. But, not all APIs are web services



<Envelope>
 <Header>
 </Header>
 <Body>
 <Header>
 </Header>
 </Body>
 </Envelope>

Model View Controller

- Web Technologies → Architectural Pattern

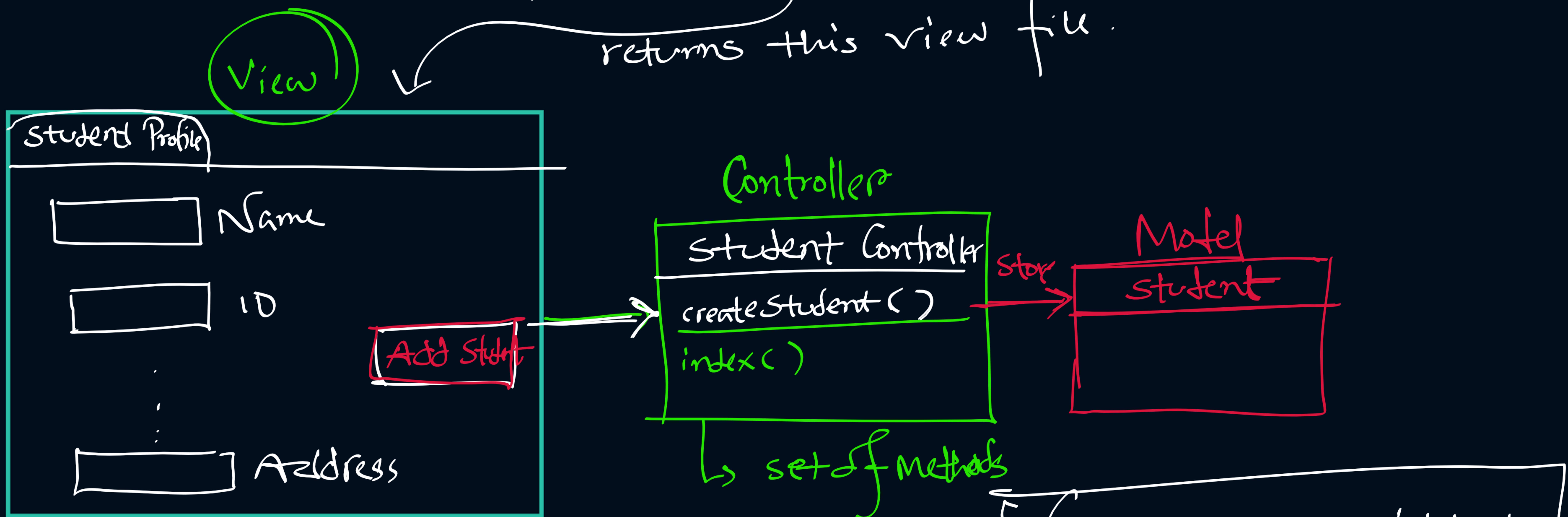
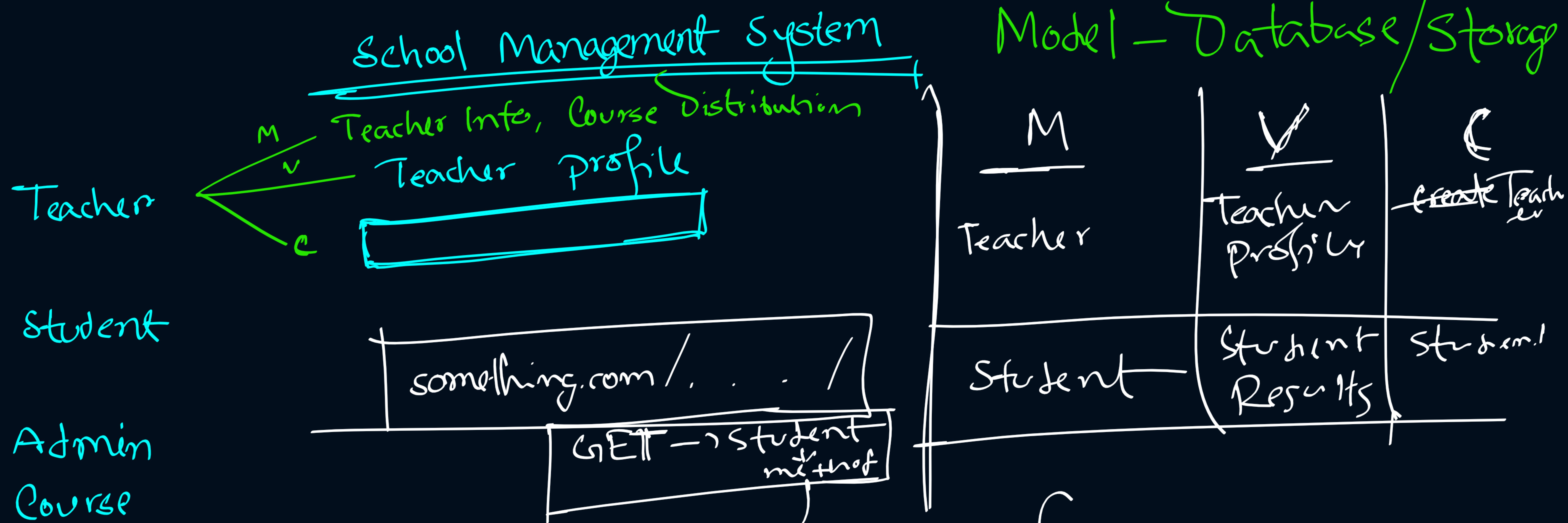
(First Discussed) 1979 → Trygve Reenskaug

(First Introduced) 1982 → SmallTalk
1988

View - Responsible for Visual Elements.

Controller

Model - Database/Storage



features of Model-V-C

- ① Test Driven Development, Easy debugging
- ② Complete Control over your HTML and Database
- ③ Clear Separation Logic
- ④ Code Re-usability.