Web Technology Literacy

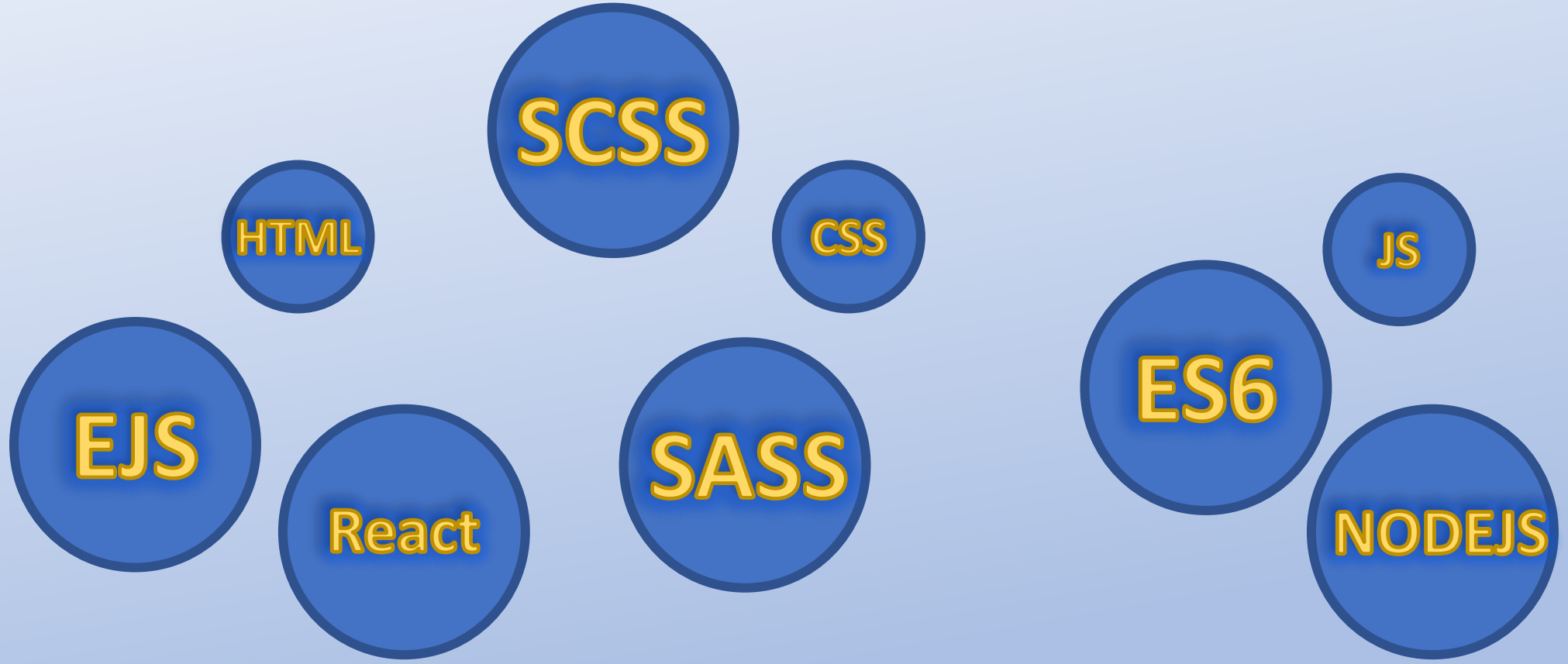
Ed Armstrong

SHARCNET

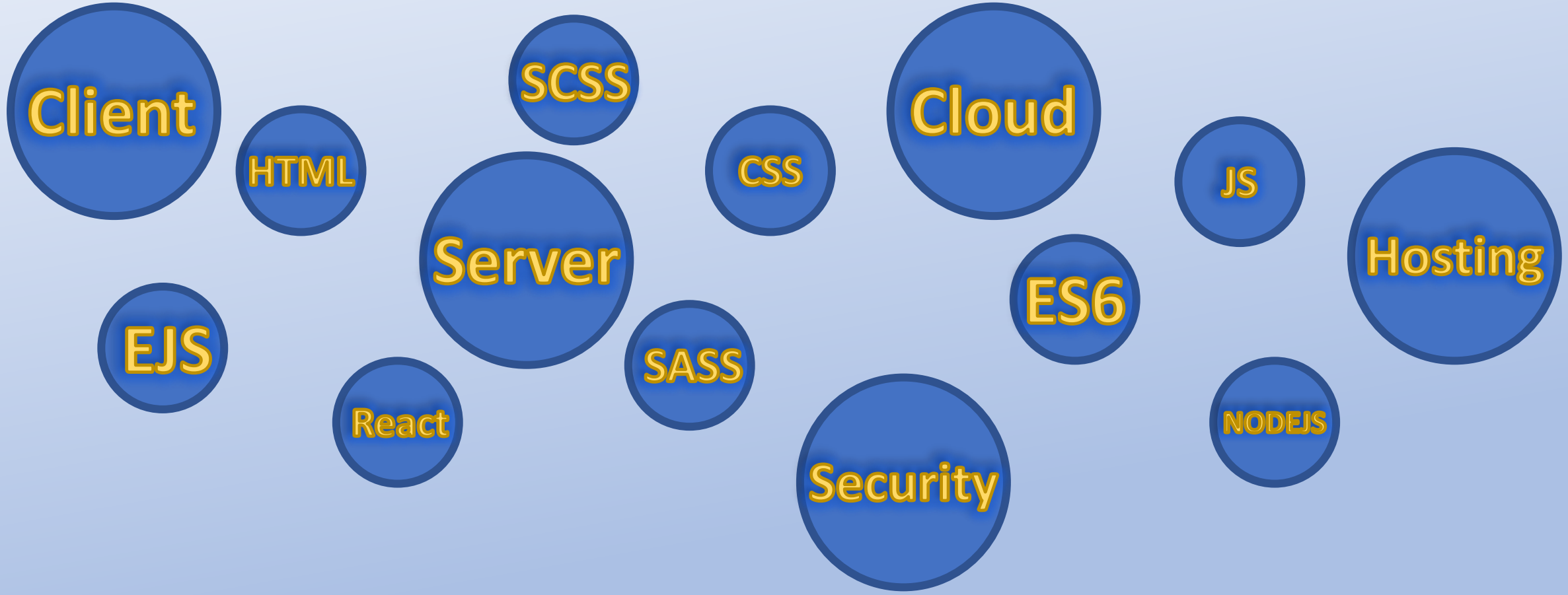
2022-05-02

What is a Web Page?

What is a Web Page?



What is a Web Page?



HTML

```
My website is AWESOME!!
This is one paragraph.
website
```

Body

```
<body>
  <h1>My website is AWESOME!!</h1>
  <p>This is one paragraph.</p>
  <a href="http://somesite.com>website</a>
</body>
```

Paragraph

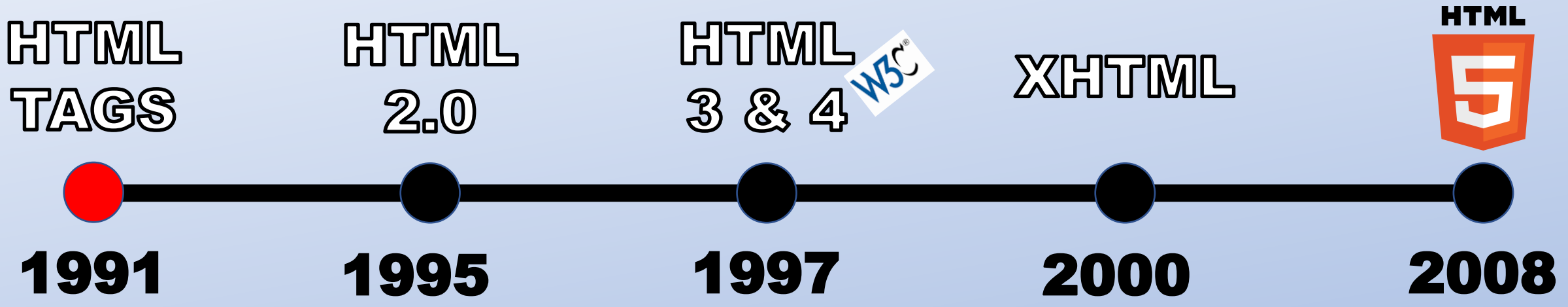
```
<body>
  <h1>My website is AWESOME!!</h1>
  <p>This is one paragraph.</p>
  <a href="http://somesite.com>website</a>
</body>
```

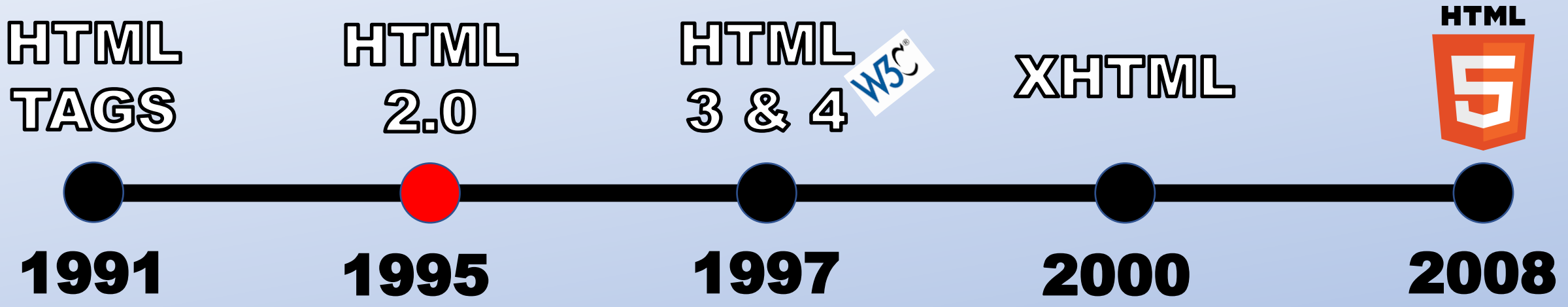
Header

```
<body>
  <h1>My website is AWESOME!!</h1>
  <p>This is one paragraph.</p>
  <a href="http://somesite.com>website</a>
</body>
```

Anchor

```
<body>
  <h1>My website is AWESOME!!</h1>
  <p>This is one paragraph.</p>
  <a href="http://somesite.com>website</a>
</body>
```


HTML
TAGS
HTML
2.0
HTML
3 & 4
W3C
XHTML
HTML
1991
1995
1997
2000
2008


HTML
TAGS
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HTML
1991
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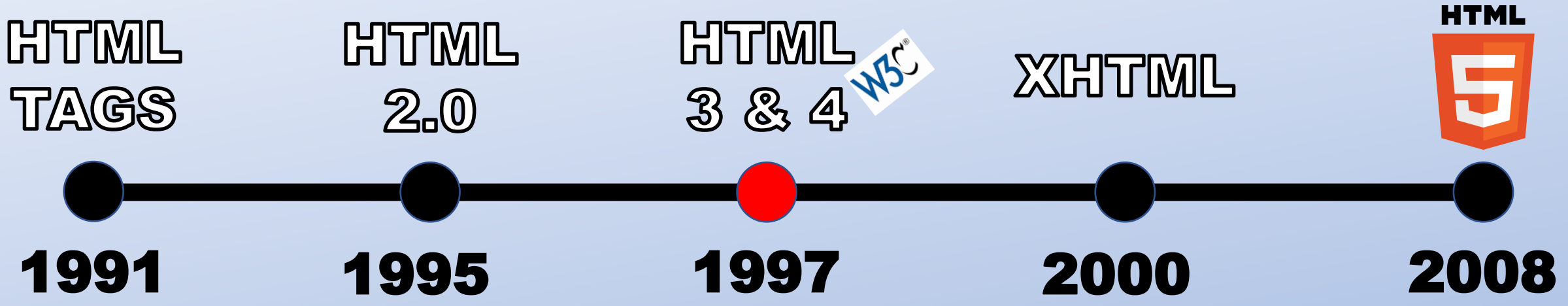
HTML
TAGS
1991
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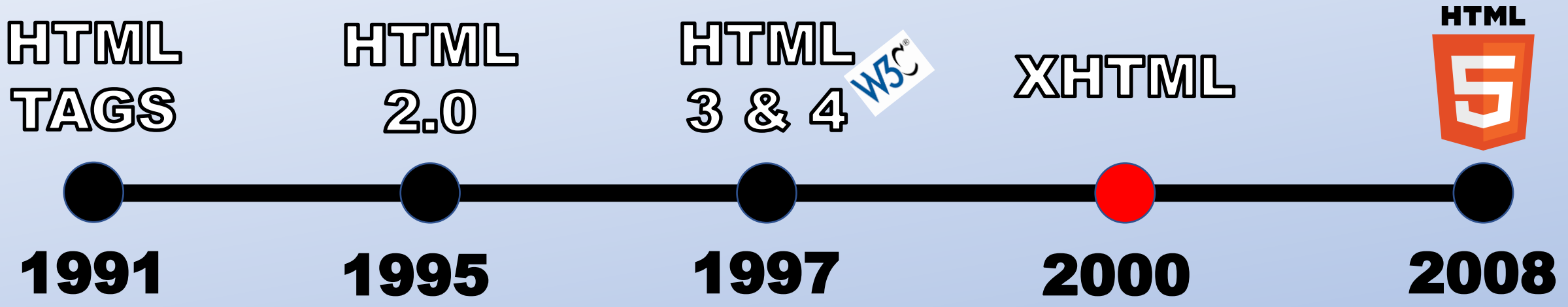
3 & 4
1997
XHTML
2000
HTML
2008


HTML
TAGS
1991
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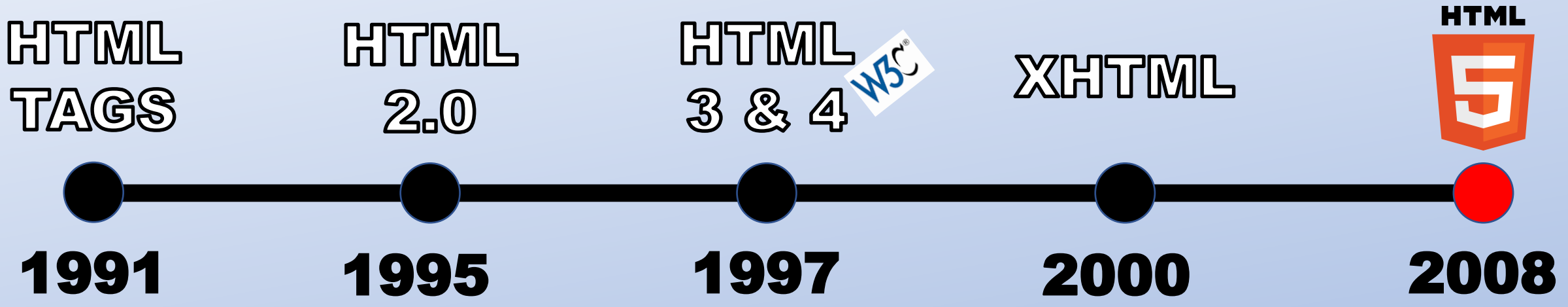
XHTML
2000
HTML
2008


HTML
TAGS
1991
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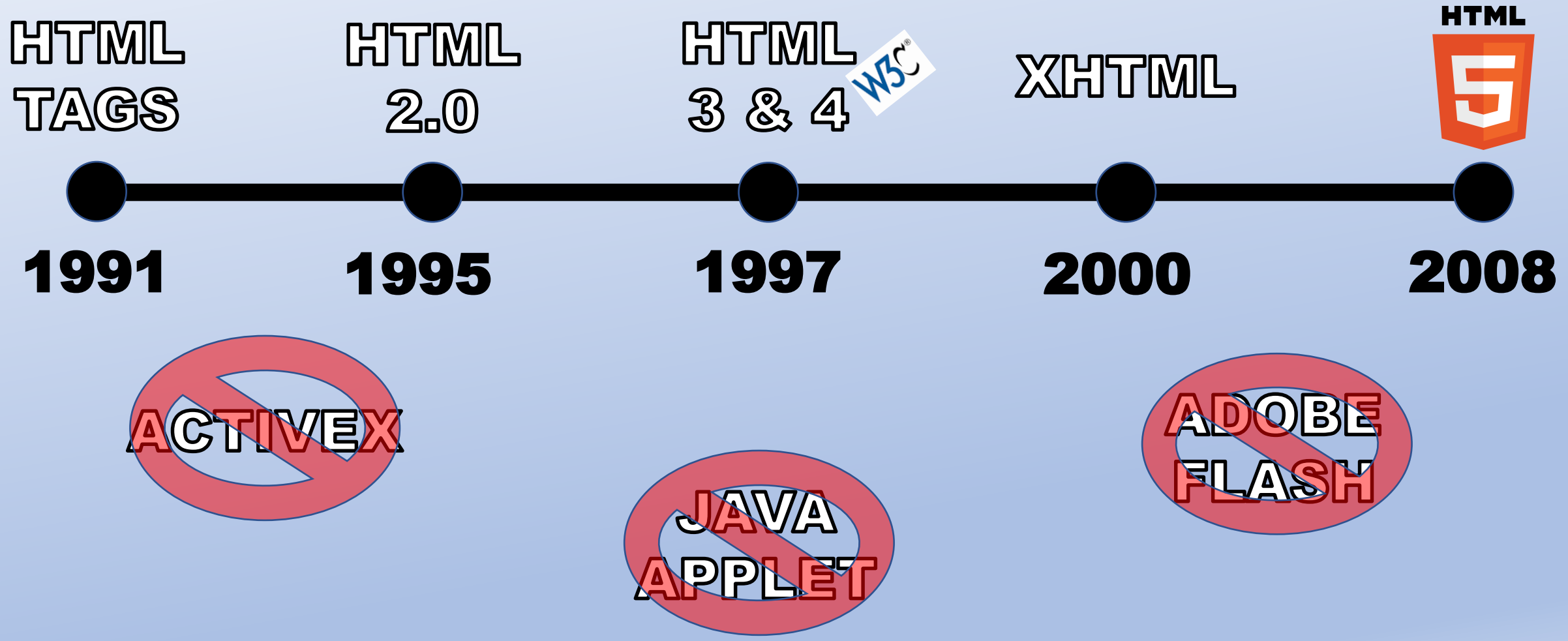
3 & 4
1997
XHTML
2000
HTML
2008


HTML
TAGS
HTML
2.0
HTML
3 & 4
W3C
XHTML
HTML
1991
1995
1997
2000
2008
ACTIVEX
JAVA
APPLET
ADOBE
FLASH

Opening Tag

```
<h1>My website is AWESOME!!</h1>
```

Closing Tag

```
<h1>My website is AWESOME!!</h1>
```

Content

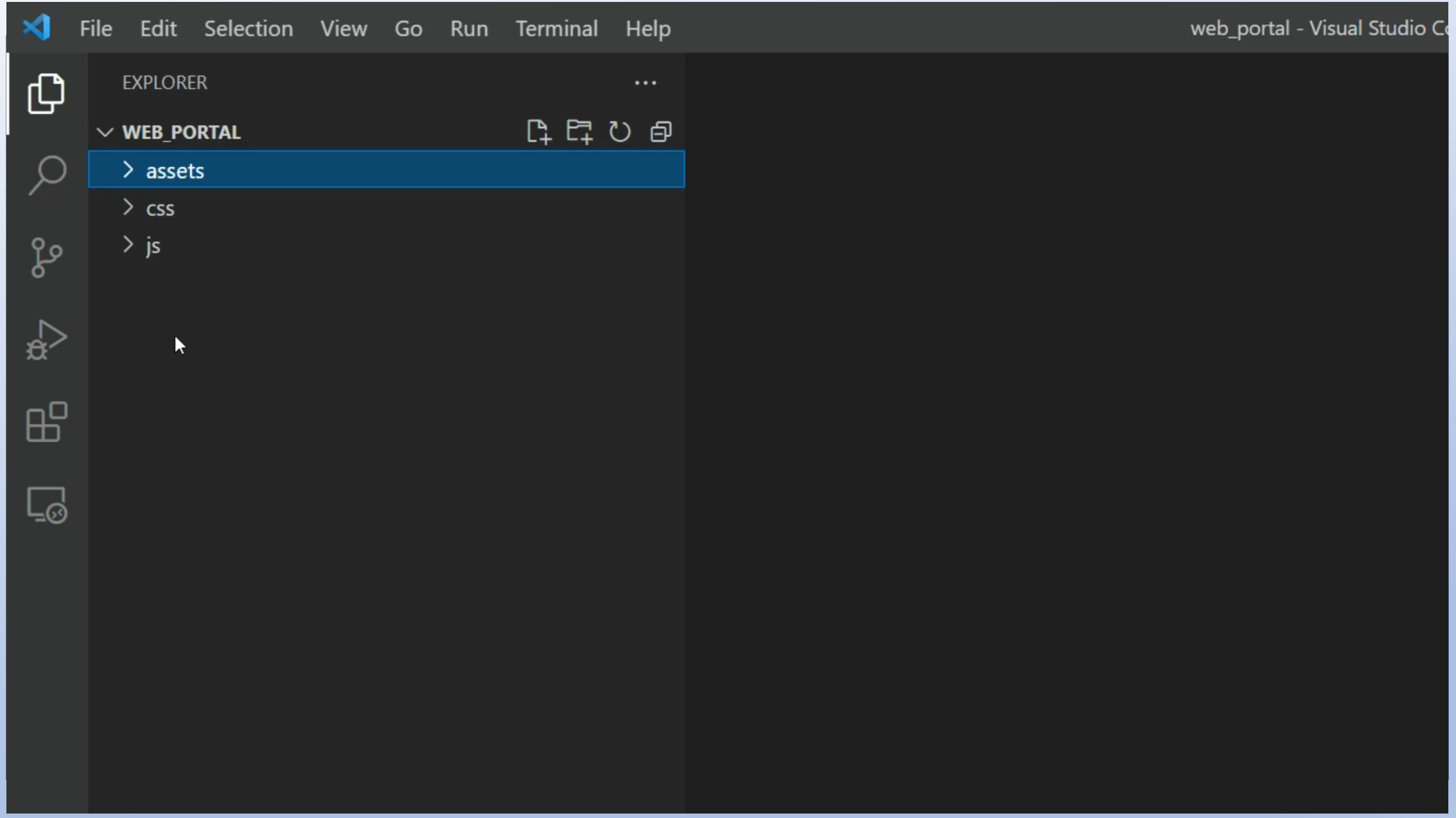
```
<h1>My website is AWESOME!!</h1>
```

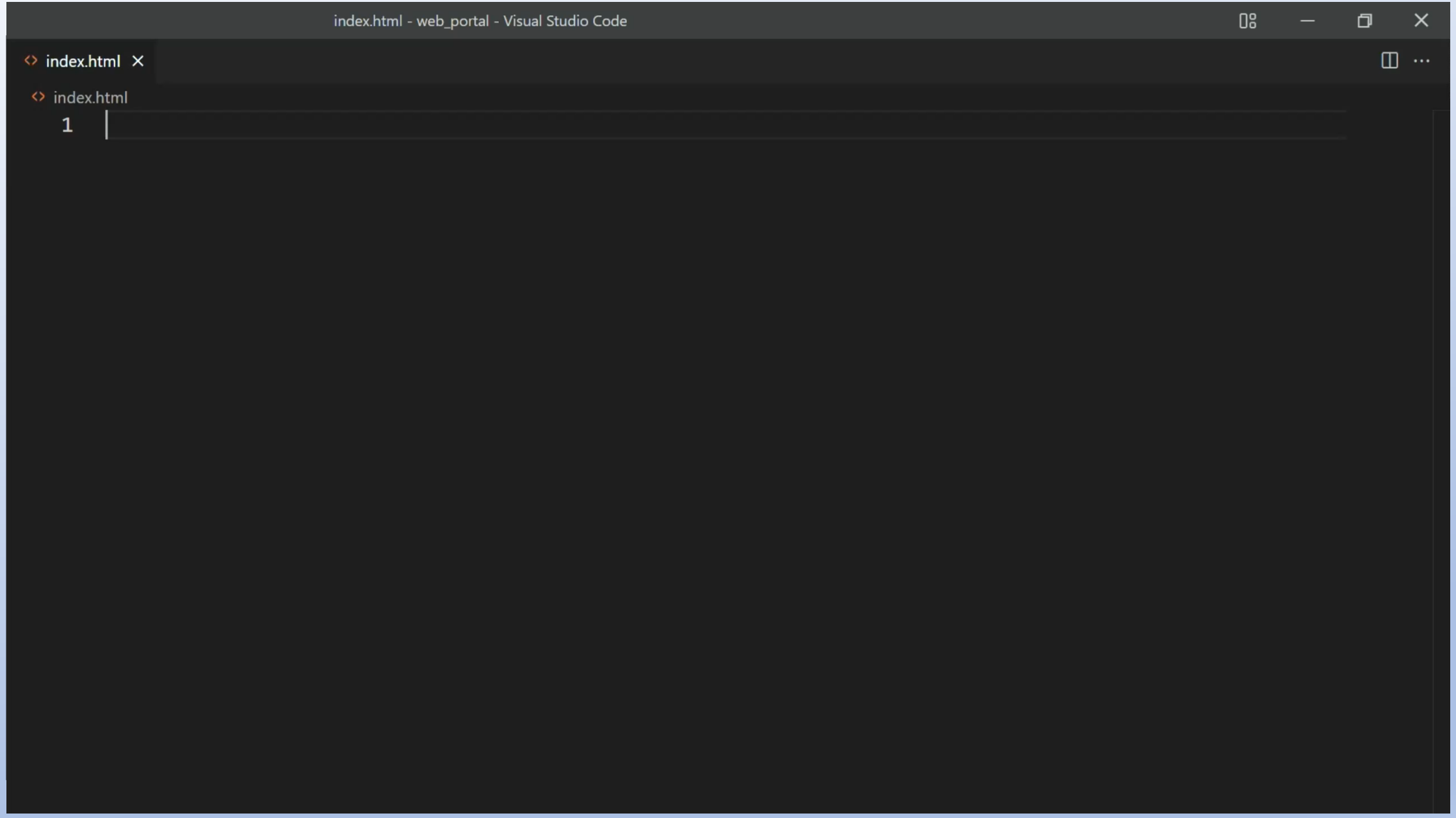
Self Contained Tag

```
<img src="my_img.png" />
```

Attribute

```
<img src="my_img.png"/>
```


File
Edit
Selection
View
Go
Run
Terminal
Help
web_portal - Visual Studio C
EXPLORER
WEB_PORTAL
assets
css
js


index.html - web_portal - Visual Studio Code
index.html
index.html
1

CSS

CASCADING STYLE SHEETS

Main Page

From Wikipedia, the free encyclopedia
Jump to navigation Jump to search

Welcome to Wikipedia

,
the free encyclopedia that anyone can edit.
6,478,996 articles in English

- The arts
- Biography
- Geography
- History
- Mathematics
- Science
- Society
- Technology
- All portals

From today's featured article

Martin Rundkvist (born 4 April 1972) is a Swedish archaeologist who focuses on the Bronze, Iron, and Middle Ages of Scandinavia. He has excavated various sites in Sweden. In a 2011 book, he identified nine possible regional power centres in Östergötland, and attempted

In the news

Men's Boat Race finish

- Hundreds of **Ukrainian civilians are found dead** after Russia's occupation of the city of Bucha.
- In rowing, Oxford win the men's event *(finish pictured)* and Cambridge win the women's event in **The Boat Race**.
- Fidesz, led by Viktor Orbán, wins a fourth consecutive term in **the Hungarian parliamentary election**.
- Sri Lanka declares a state of emergency due to **street protests** related to the economic crisis.

Ongoing:

- COVID-19 pandemic

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Community portal
Recent changes
Upload file

Tools
What links here
Related changes
Special pages
Permanent link
Page information
Wikidata item

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Printable version

In other projects
Wikimedia Commons
MediaWiki
Meta-Wiki
Multilingual Wikisource
Wikispecies
Wikibooks
Wikidata
Wikimania
Wikinews
Wikiquote
Wikisource

Welcome to Wikipedia,

the free encyclopedia that anyone can edit.
6,478,996 articles in English

- The arts
- Biography
- Geography
- History
- Mathematics
- Science
- Society
- Technology
- **All portals**

From today's featured article

Martin Rundkvist (born 4 April 1972) is a Swedish archaeologist who focuses on the Bronze, Iron, and Middle Ages of Scandinavia. He has excavated various sites in Sweden. In a 2011 book, he identified nine possible regional power centres in Östergötland, and attempted to determine where the "Beowulfian mead halls" of the day once stood. Years later at one of these sites, Aska, he uncovered the foundations of a large mead hall, and 22 ornate gold figures that may have represented gods or royals. Rundkvist has also catalogued the finds from Barshalder, the largest prehistoric cemetery on Sweden's Gotland island; excavated the boat grave of a Viking; and analysed both the placement of deposited artefacts in the landscape and the lifestyles of élite Scandinavians during the Middle Ages. Rundkvist authors the blog *Aardvarchaeology*, which the James Randi Educational Foundation termed "the most-read archaeology blog on the Internet". He is an associate professor at the University of Łódź in Poland. (**Full article...**)

Recently featured: 2009 Women's Cricket World Cup Final · Northern rosella · Coropuna
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Did you know ...

- ... that **Royce Clayton** *(pictured)* idolized Ozzie Smith, the shortstop for the St. Louis Cardinals, as an amateur and took his job as a

In the news

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- In rowing, Oxford win the men's event *(finish pictured)* and Cambridge win the women's event in **The Boat Race**.
- Fidesz, led by Viktor Orbán, wins a fourth consecutive term in **the Hungarian parliamentary election**.
- Sri Lanka declares a state of emergency due to **street protests** related to the economic crisis.

Ongoing: COVID-19 pandemic · Russian invasion of Ukraine
Recent deaths: Lygia Fagundes Telles · Joyce Fairbairn · Nancy Milford · Moana Jackson · Margaret M. McGowan · Shirley Burkovich
Nominate an article

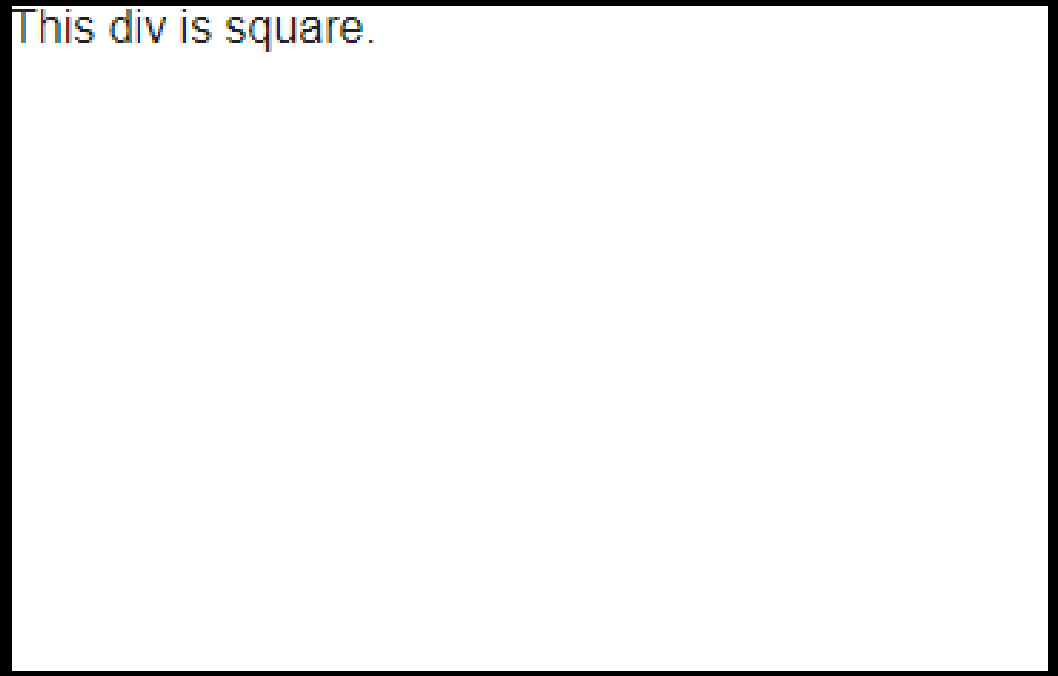
On this day

April 4

- 1866 – Russian tsar Alexander II narrowly survived an assassination attempt by **Dmitry Karakozov**.
- 1873 – **The Kennel**

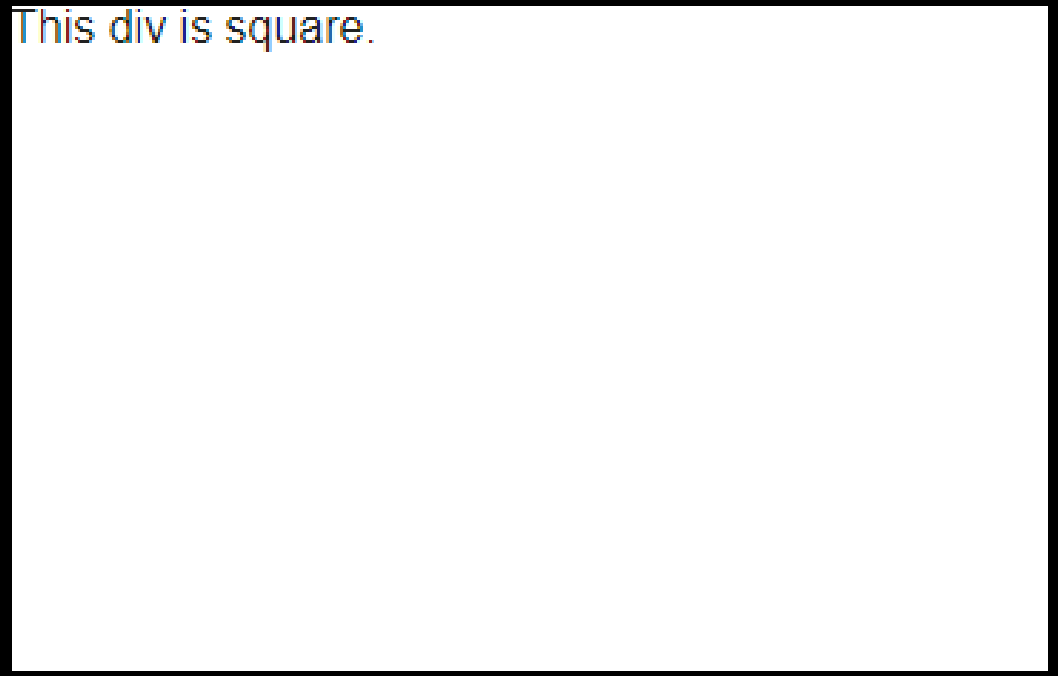
```
<div>
  This div is square.
</div>
```

index.html



```
<div class="square">
  This div is square.
</div>
```

index.html

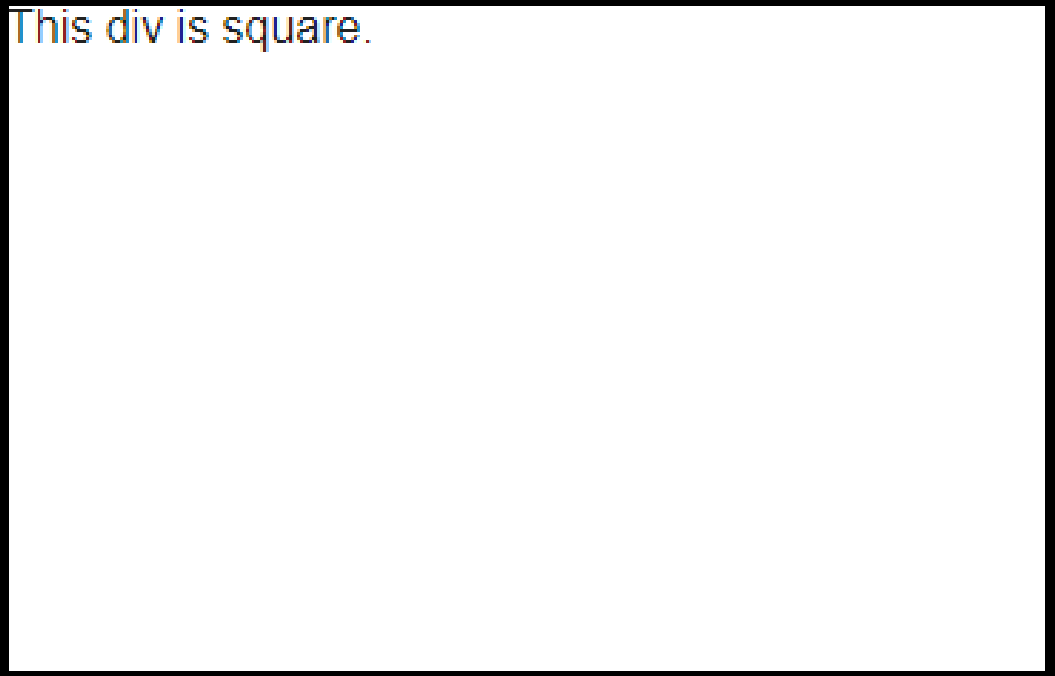


```html
<div class="square">
  This div is square.
</div>
```

index.html

```css
.square{
}
```

index.css



```html
<div class="square">
  This div is square.
</div>
```

index.html

```css
.square{
  background-color: skyblue;
}
```

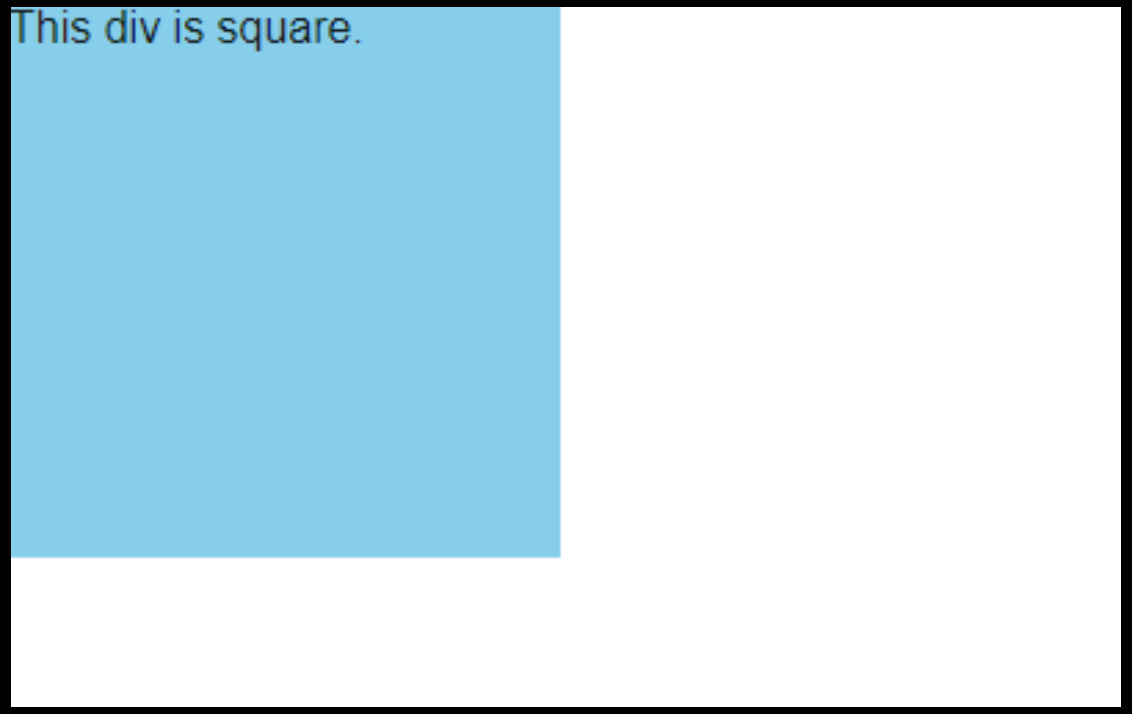
index.css

```html
<div class="square">
  This div is square.
</div>
```

index.html

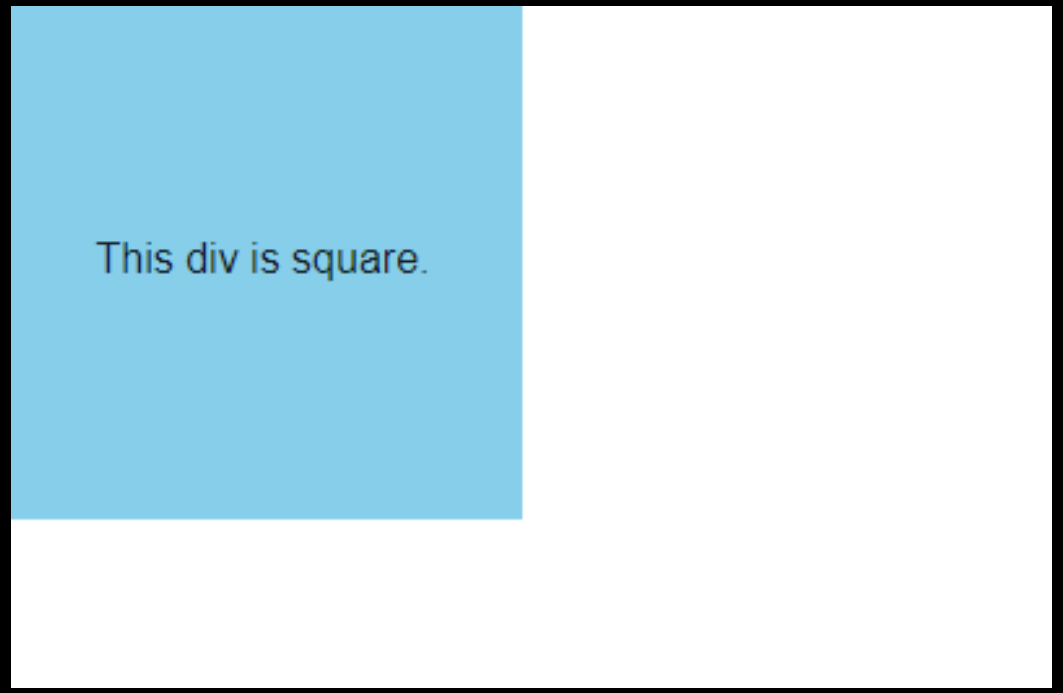
```css
.square{
  background-color: skyblue;
  width: 300px;
  height: 300px;
}
```

index.css



```
<div class="square center">
  This div is square.
</div>
```

```
.square{
  background-color: skyblue;
  width: 300px;
  height: 300px;
}
.center{
  text-align: center;
}
```



```
div { font-size : 1.2; }
```

Key **Value**

```
div { font-size : 1.2; }
```

CASCADING

Lorem Ipsum is dummy text.

```
div { color : green;}
```

Lorem Ipsum is dummy text.

```
div { color : green;}
div { color : red;}
```

Lorem Ipsum is dummy text.

```
div { color : green;}
div { color : red;}
div { color : black;]
```

Simple Selectors

- Tag Name: div, span, p, h1
- Class: .round, .centered, .hidden
- ID: #container, #save_button

```
<div class="round" id="first">
    Lorem Ipsum is dummy text.
</div>
```

```
div { color : green;}
.round { color : red;}
#first { color : black;]
```

```
<div class="round" id="first">
    Lorem Ipsum is dummy text.
</div>
```

```
div { color : green;}
.round { color : red;}
#first { color : black;]
```

```
<div class="round" id="first">
    Lorem Ipsum is dummy text.
</div>
```

```
div { color : green;}
.round { color : red;}
#first { color : black;]
```

```
<div class="round" id="first">
    First round div.
</div>
<div class="round" id="second">
    Second round div.
</div>
<div class="square" id="first">
    First square div.
</div>
```

```
#first.round { color: red;}
#second.round { font-size: 5px }
```

```
<div class="round" id="first">
    First round div.
</div>
<div class="round" id="second">
    Second round div.
</div>
<div class="square" id="first">
    First square div.
</div>
```

```
#first.round { color: red; }
#second.round { font-size: 50px; }
```

First round div.

Second round div.

First square div.

```
#first.round { color: red }
#second.round { font-size: 50px }
```

JavaScript

HTML

CSS

Model

View

Control

1994

JS

1994 1995

JaMoCha

JS

JScript

ECMA*

1994 1995 1996

ECMAScript

* European Computer Manufacturers Association

JS

JScript

ECMA*

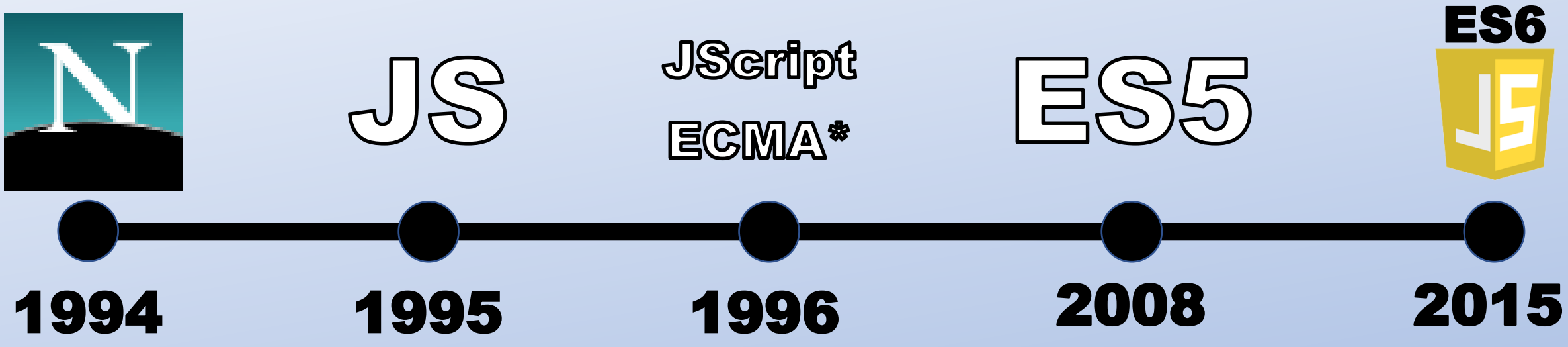
ES5

1994

1995

1996

2008


JS
JScript
ECMA*
ES5
ES6
1994
1995
1996
2008
2015

HIGH LEVEL

GARBAGE COLLECTED

INTERPRETED

JIT COMPILED

DYNAMICALLY TYPED

MULTI-PARADIGM

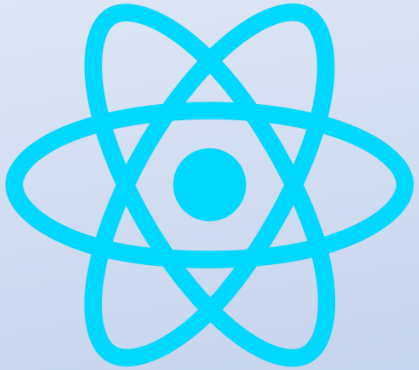
*EVENT-DRIVEN * FUNCTIONAL * OO*

SINGLE THREADED

NON-BLOCKING EVENT LOOP

WA

SERVER SIDE SCRIPTING

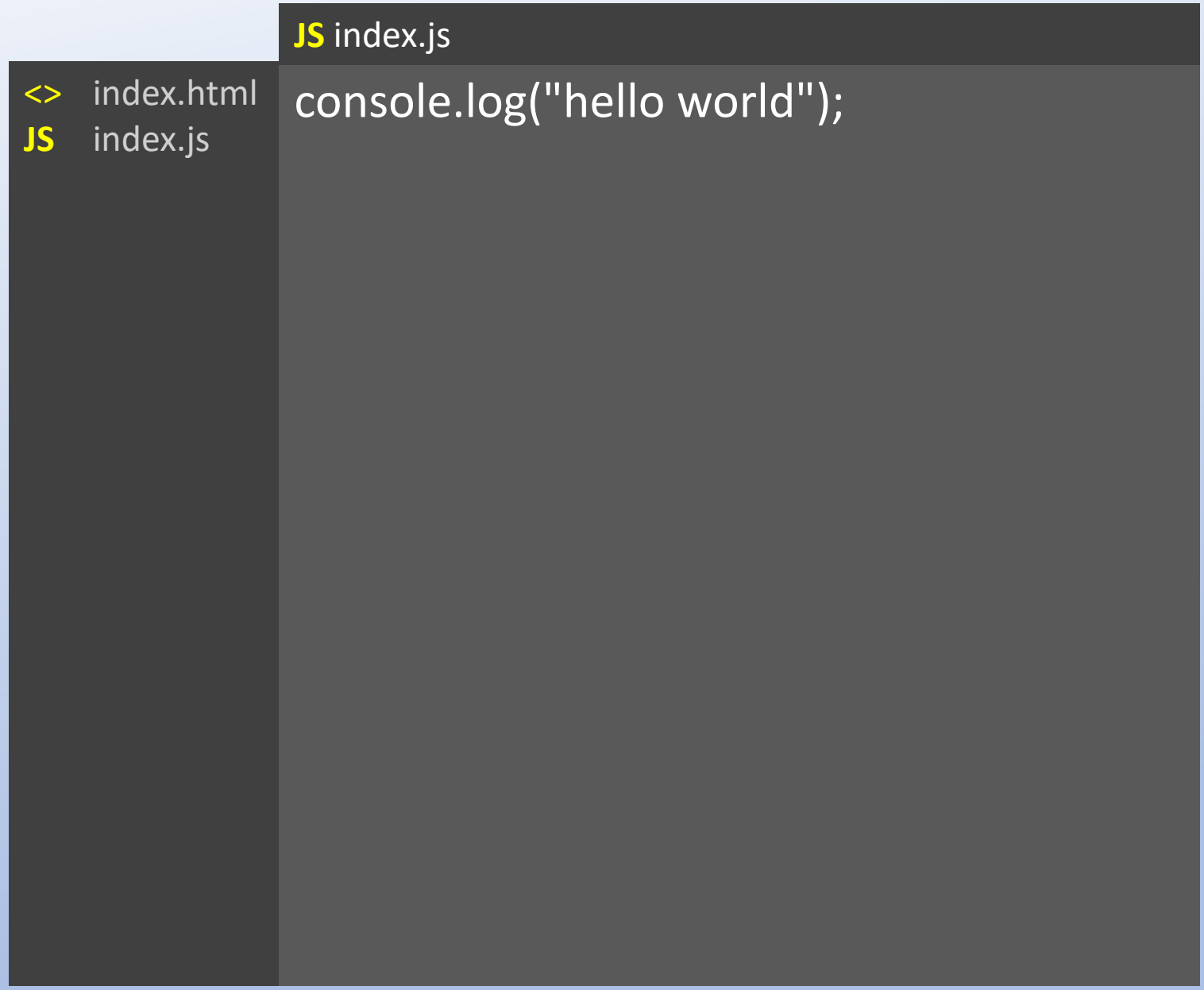


MOBILE APPLICATIONS

<> index.html
JS index.js

<> index.html

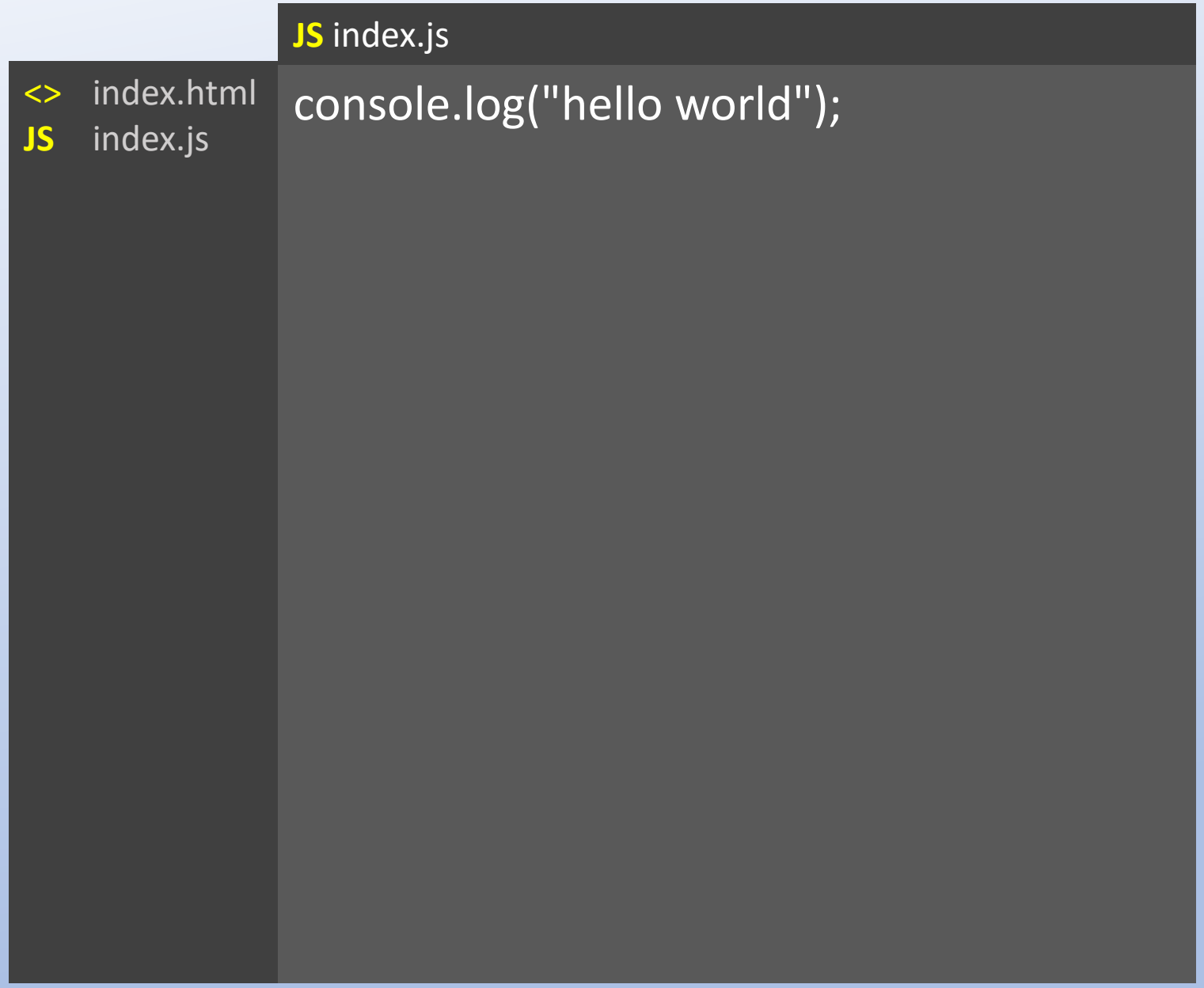
```
<html>
    <head></head>

    <body>
        <div id="title>Hello World</div>
        <script src="index.js"></script>
    </body>
</html>
```



JS index.js

```
console.log("hello world");
```

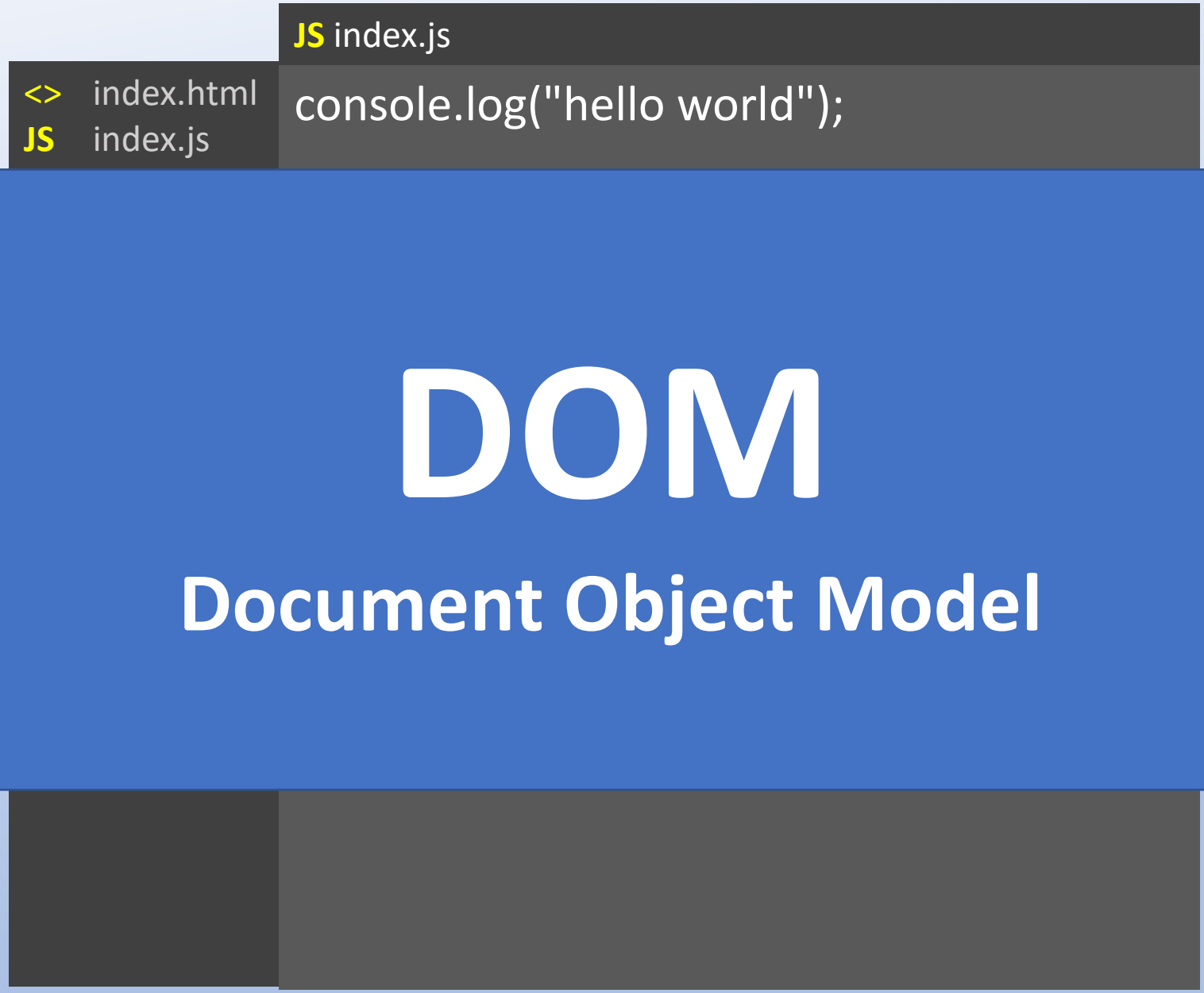
<> index.html
JS index.js



JS index.js

<> index.html
JS index.js

```
console.log("hello world");
```


<> index.html
JS index.js
JS index.js
console.log("hello world");
DOM
Document Object Model

<> index.html
JS index.js

JS index.js

```
var ele = document.queryselectory("#index");

let ele = document.queryselectory("#index");

const ele = document.queryselectory("#index");
```

<> index.html
JS index.js

JS index.js

```
const ele = document.queryselectory("#index");

ele.addEventHandler("click", () =>{
      alert("Clickety Click !!!");
});
```

<> index.html
JS index.js

JS index.js

```
const ele = document.queryselectory("#index");

const foo = () => "I'm functional!";
```

<> index.html
JS index.js

JS index.js

```
const ele = document.queryselectory("#index");

class Wheel extends CarPart{
    static name = "my name";

    constructor(){
    }

    method(){
    }

    get setting(){}
    set setting(value){}
}
```

Hyper-Text Transfer Protocol

- Defines how web-based applications communicate between the **client** and the **server**.

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- The principal protocol used for web communication.

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- Deliver content such as: HTML, CSS, JS, images, audio & video.

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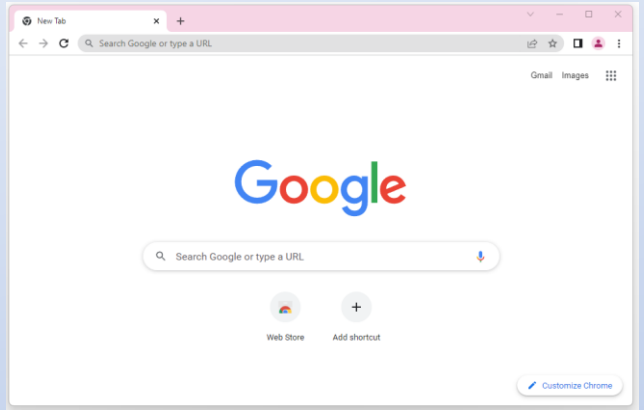
- The principal protocol used for web communication.
- Deliver content such as: HTML, CSS, JS, images, audio & video.
- HTTP/1.1, HTTP/2, HTTP/3

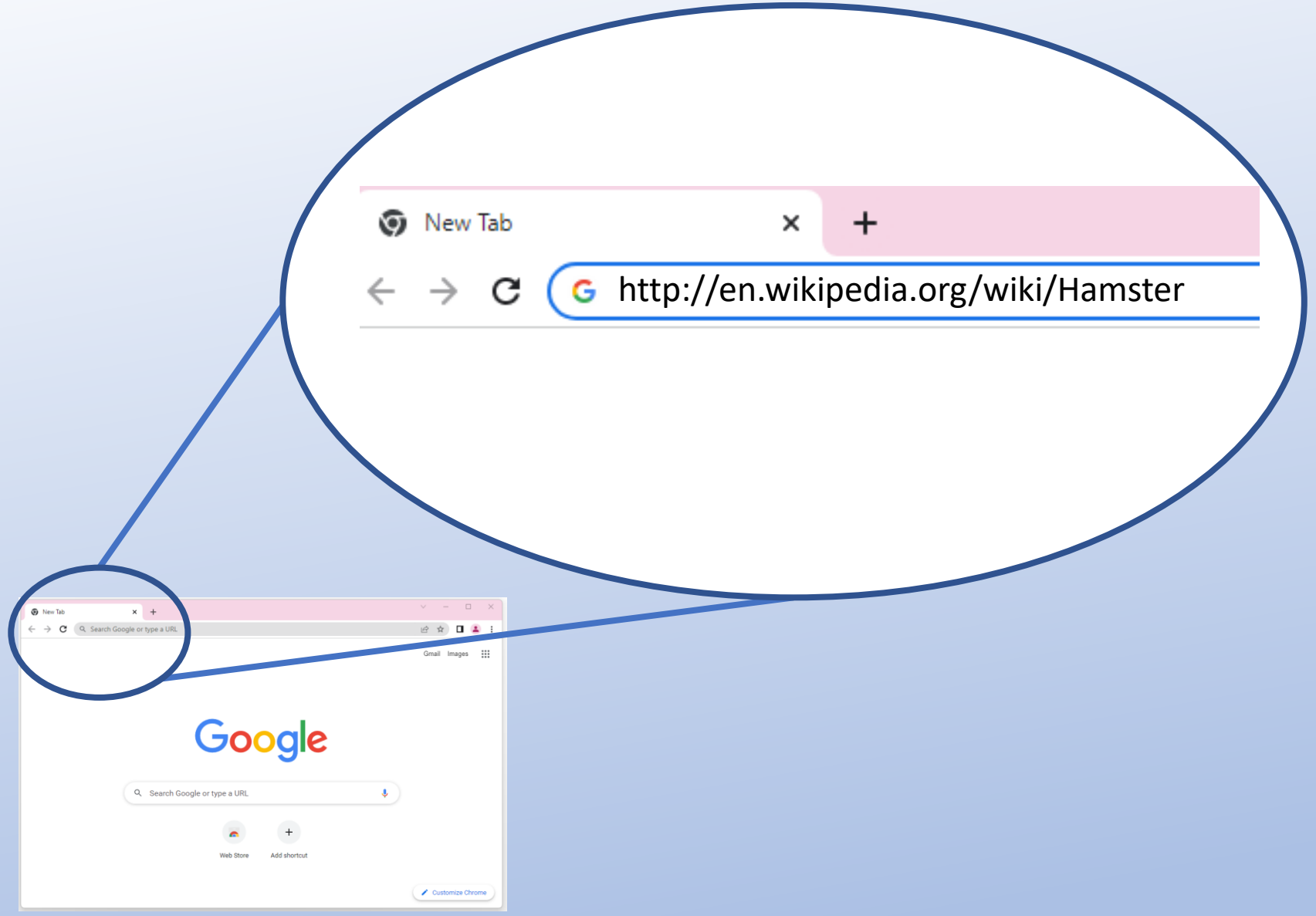


HTTP REQUEST

HTTP RESPONSE

Connectionless

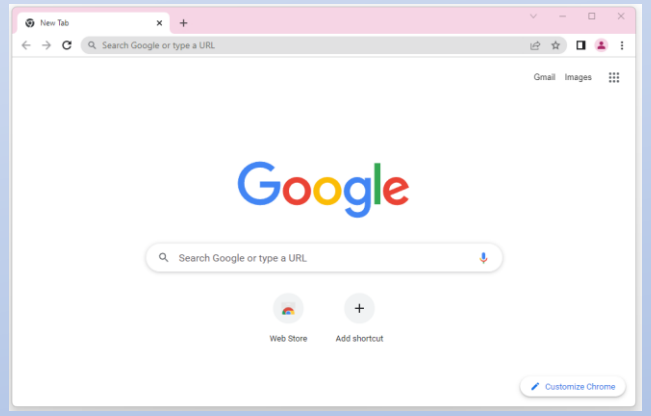
Stateless



Browser = Client

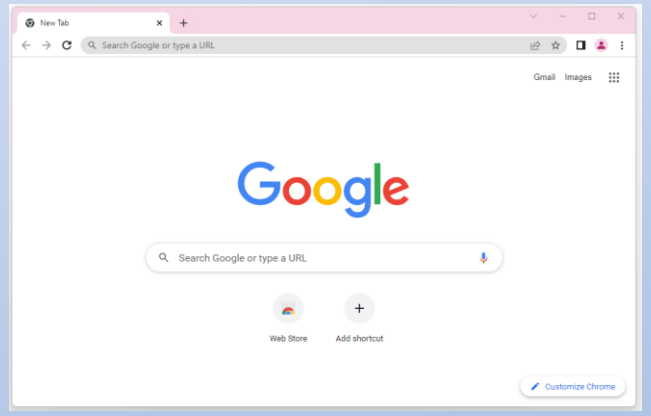
Web Server

HTTP REQUEST



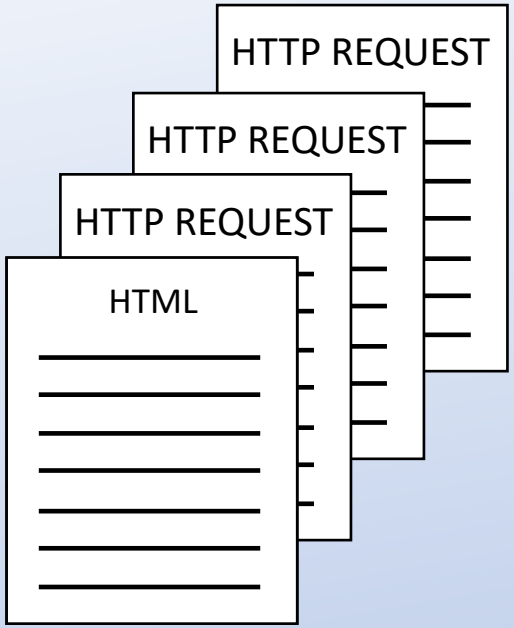
Browser = Client

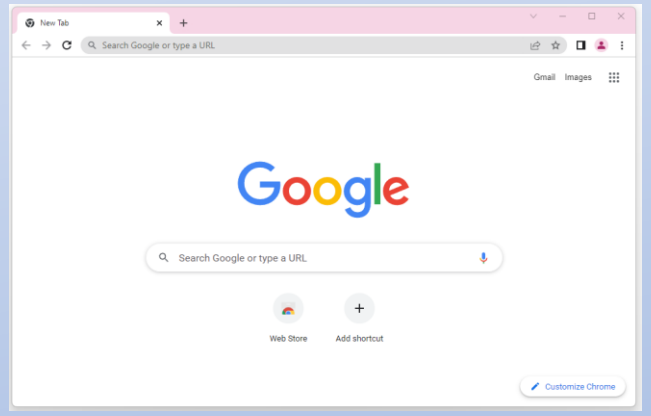
Web Server



Browser = Client

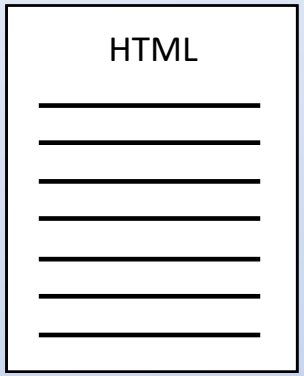
Web Server

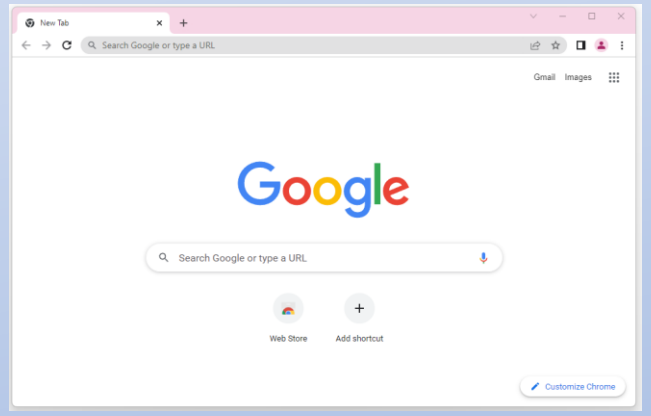




Browser = Client

Web Server





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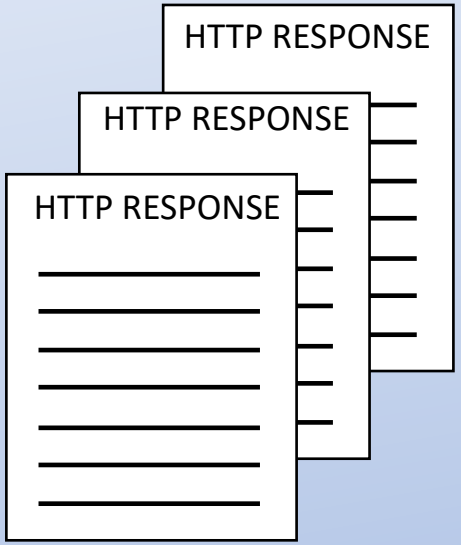
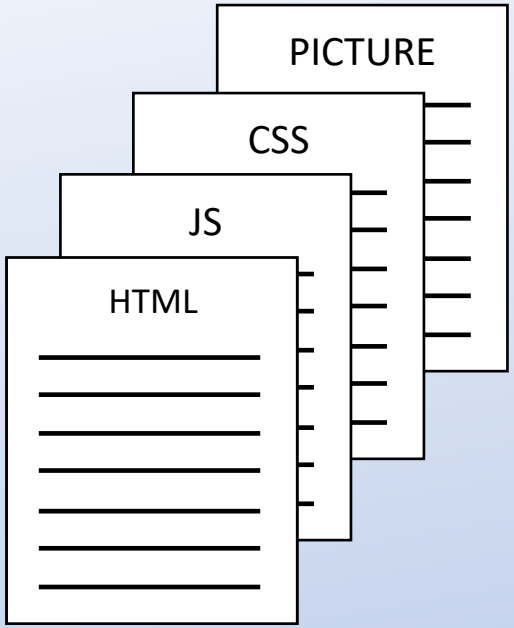
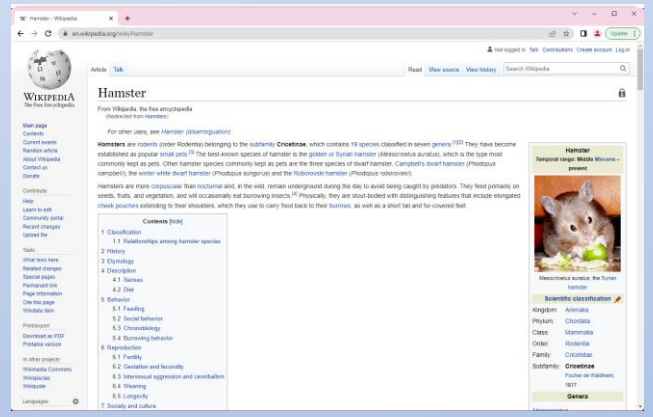


Web Server



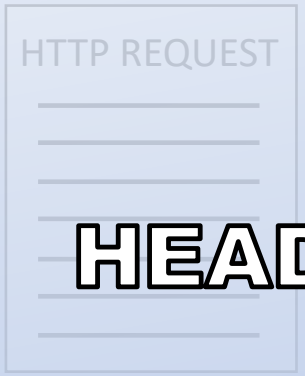


Browser = Client

Web Server

REQUEST LINE

HEADERS



Browser - client

HTTP REQUEST

GET https://en.wikipedia.org/wiki/Hamster http/2.0

accept: text/html,application/xhtml+xml,application/xml;q=0.9
accept-encoding: gzip, deflate, br
accept-language: en-CA,en-GB;q=0.9,en-US;q=0.8,en;q=0.7
cache-control: no-cache
cookie: Last-Access=29-Apr-2022; Last-Access-Global=29-Apr-2022; GeoIP=CA:ON:Guelph:43.55:-80.25:v4; enwikimwuser-sessionId=c36432af644118f91db7; enwikiel-sessionId=6aee3c41b560b; enwikiwmE-sessionTickLastTickTime=1651257670986; enwikiwmE-sessionTickTickCount=7
pragma: no-cache

Web Server

RESPONSE LINE

HEADERS

BODY

HTTP RESPONSE

http/2.0 200

accept-ch: Sec-CH-UA-Arch
accept-ch: Sec-CH-UA-Bitness
accept-ch: Sec-CH-UA-Full-Version-List
accept-ch: Sec-CH-UA-Model
accept-ch: Sec-CH-UA-Platform-Version
accept-ranges: bytes
age: 72596
cache-control: private

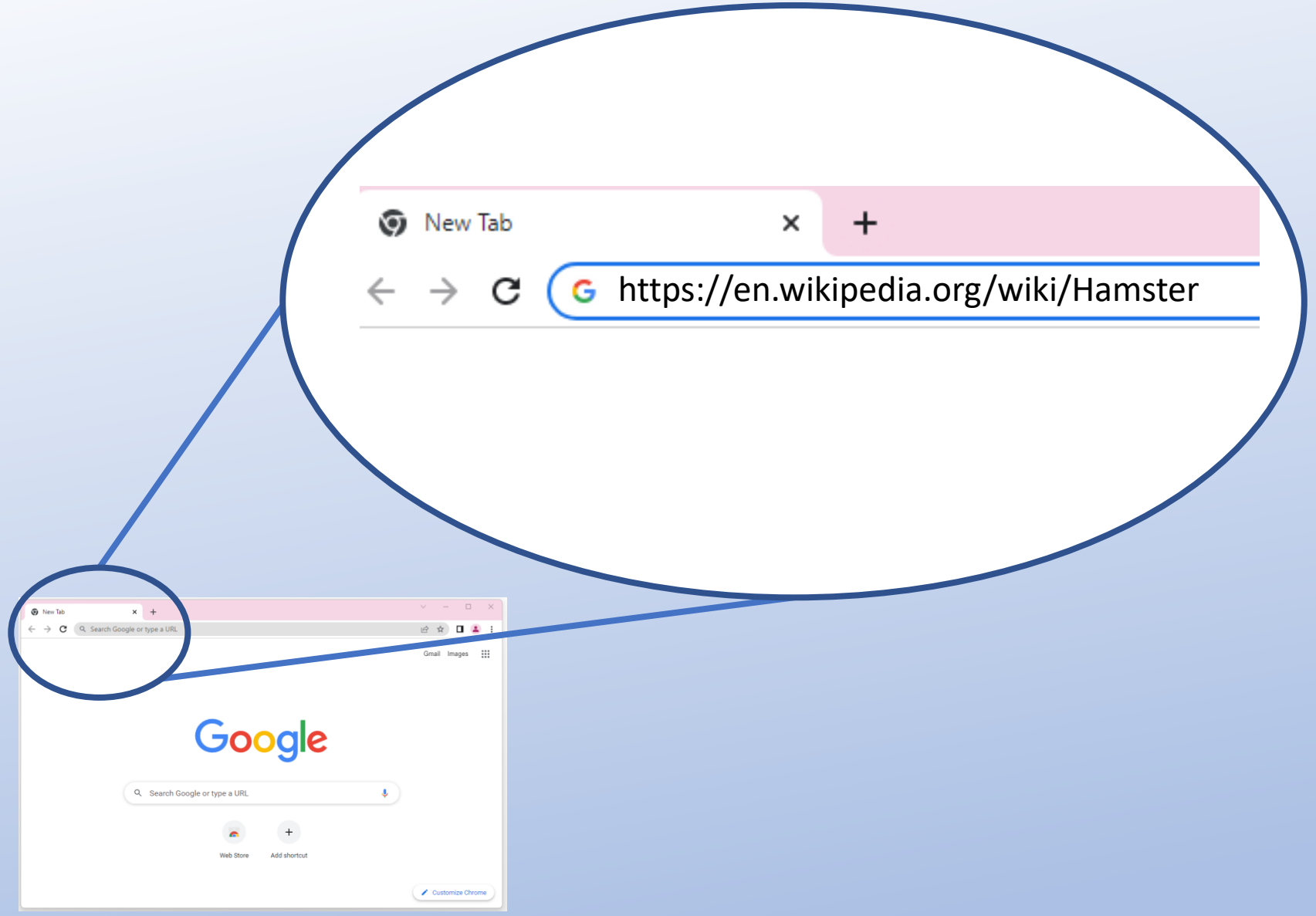
```
<html>
   <head>
   </head>
   <body>
   .....
   </body>
<html>
```

Web Server

Secure HTTP

What is HTTPS?

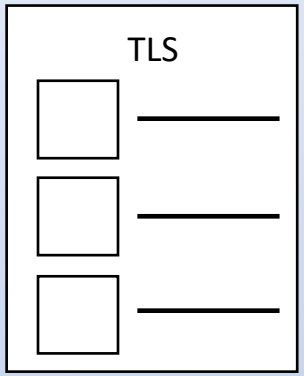
- HTTPS is the secure version of HTTP.
- SSL/TLS creates an encrypted link between a web server and browser.
- SSL stands for Secure Sockets Layer.
- TLS stands for Transport Layer Security.
- HTTP wrapped in some nice encryption.

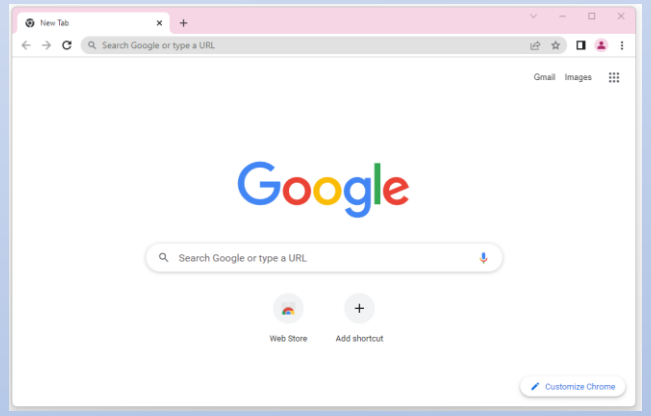


Browser = Client

Web Server

TLS Handshake

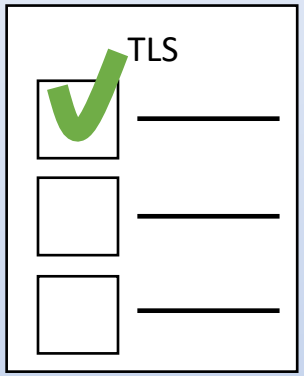


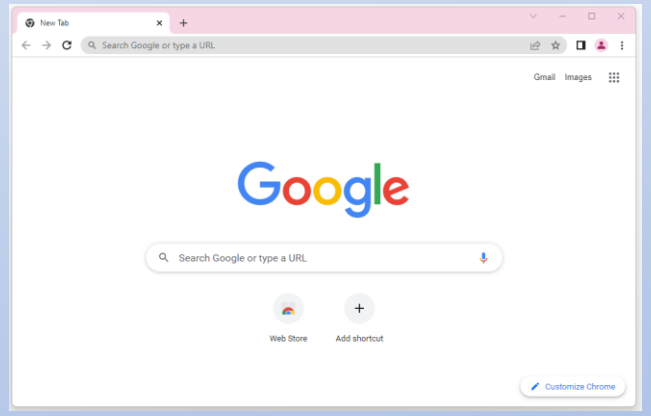


Browser = Client

Web Server

TLS Handshake

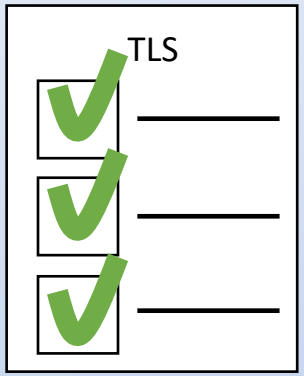


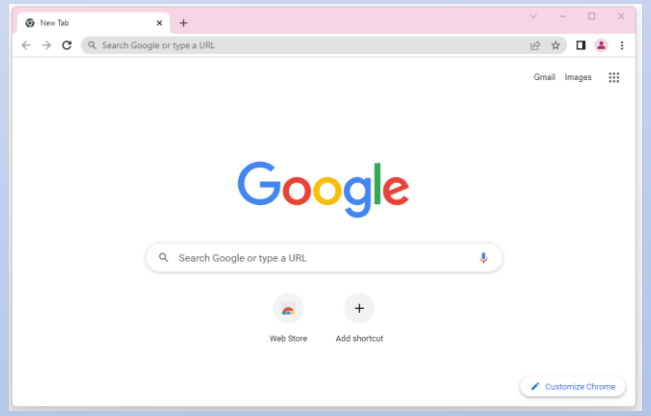


Browser = Client

Web Server

TLS Handshake

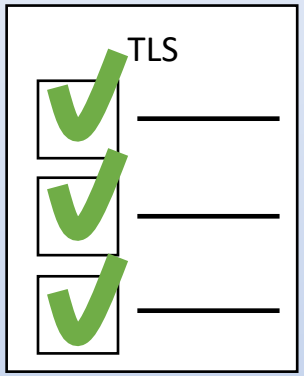


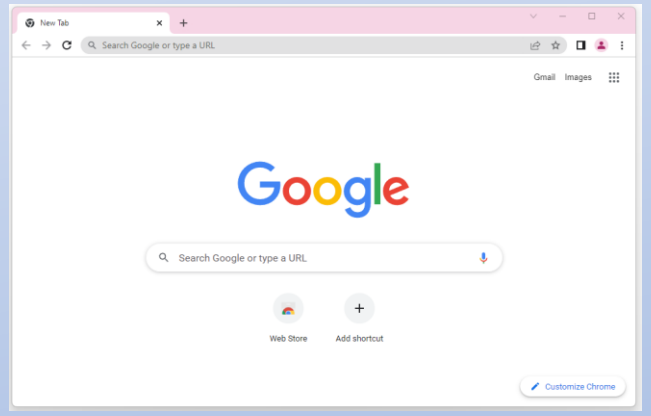


Browser = Client

Web Server

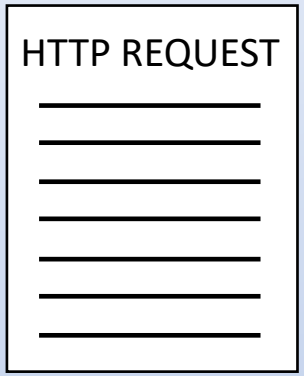
TLS Handshake

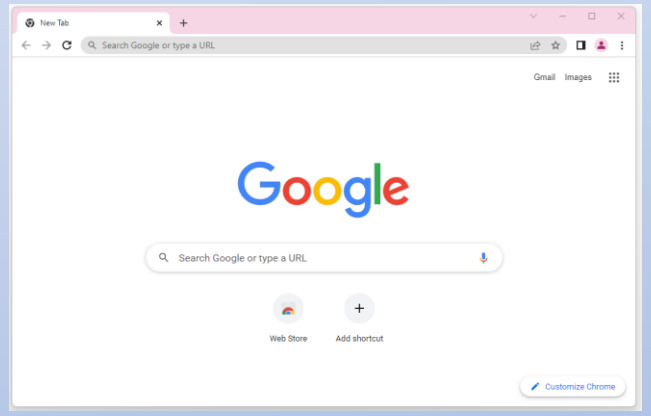




Browser = Client

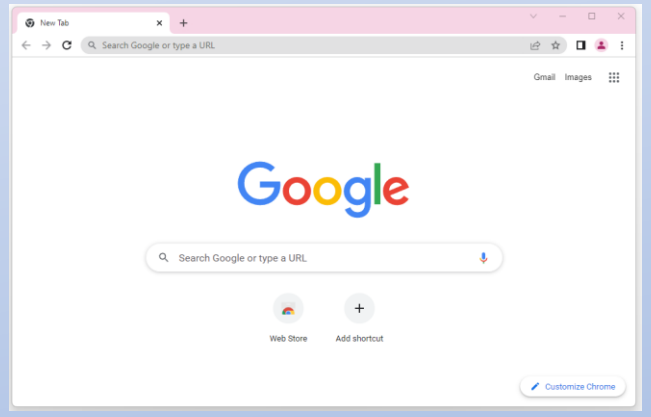
Web Server

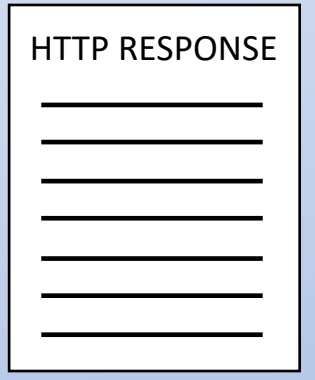




Browser = Client

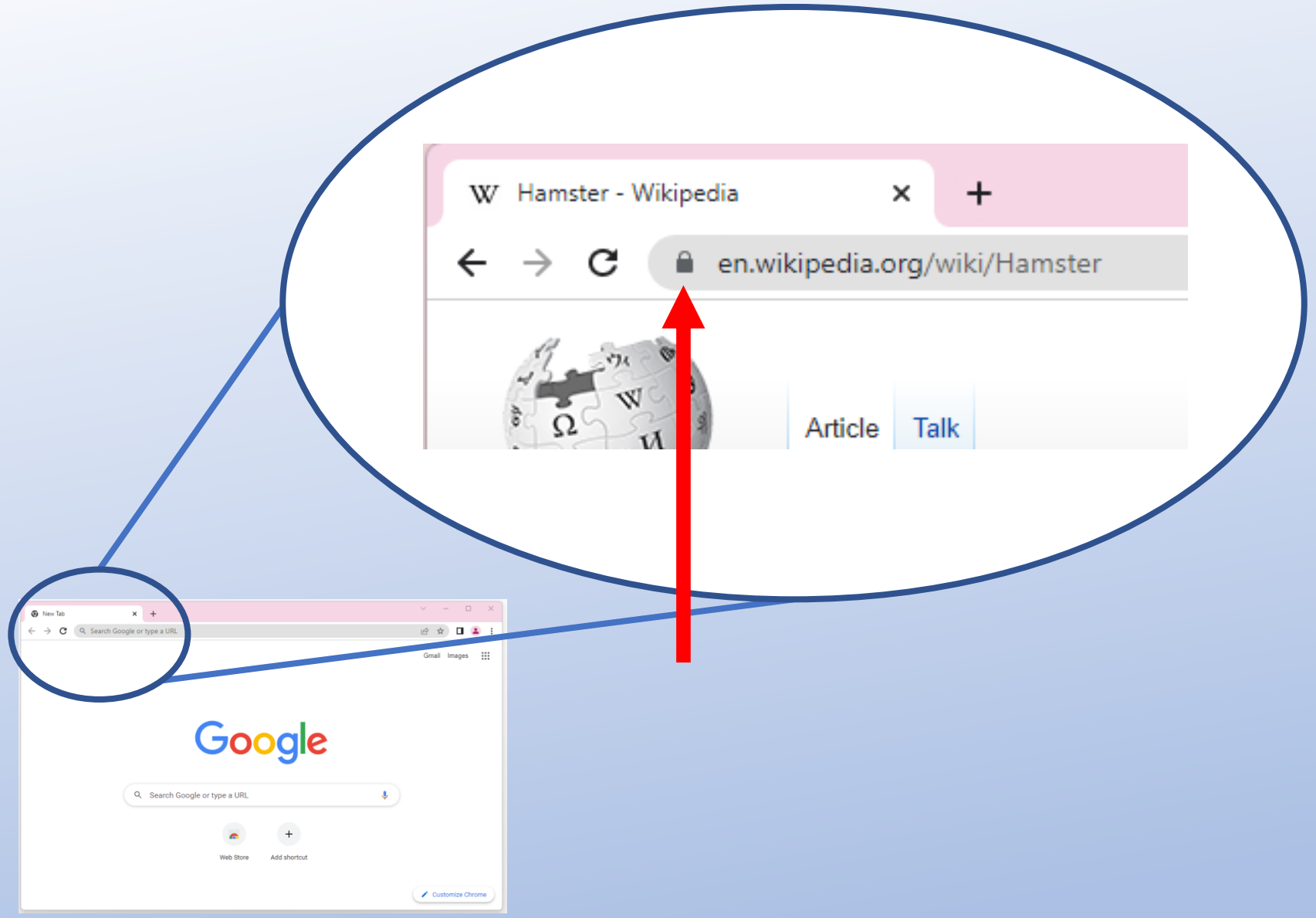
Web Server





Browser = Client

Web Server


Hamster - Wikipedia
en.wikipedia.org/wiki/Hamster
Article
Talk
New Tab
Search Google or type a URL
Gmail
Images
Google
Search Google or type a URL
Web Store
Add shortcut
Customize Chrome

Let's Encrypt

- Certificate Authority (CA)
- Free, Automated & Open Source
- Encryption is easy, Authentication is hard.
- Getting a Certificate can be a serious pain and financial burden.
- Works with many popular web-servers.
- https://letsencrypt.org/

Software Stack

Operating System	**L**inux
Web Server	**A**pache
Database	**M**ySql
Server-side scripting	**P**hp

Operating System

Web Server

Database

Server-side scripting

Linux
Windows
OS X

Operating System

Web Server

Database

Server-side scripting

Apache

Express

Nginx

Flask

Operating System

Web Server

Database

Server-side scripting

MySql
MongoDB
PostGres

Operating System

Web Server

Database

Server-side scripting

PHP
NodeJS
Java
Python
C#

HOSTING

Digital Research Alliance of Canada

+ Free for researchers
+ Hosted exclusively in Canada

- Requires moderate Linux expertise
- Scalability bound by RAC
- Self-managed

Commercial Cloud

amazon

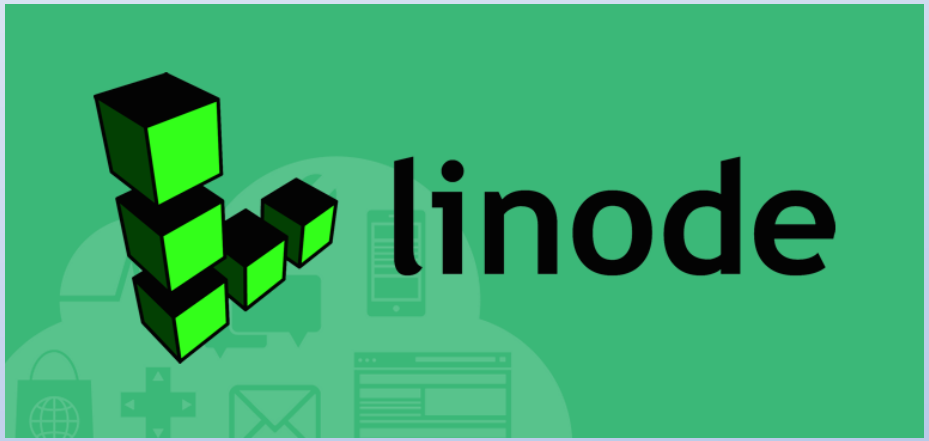
+ **Large and Scalable**
+ **Many (non-website) options**

- **Expensive / obscure billing**
- **Difficult to navigate**

GitHub

+ Easy to use / no Linux CL
+ Free * (one site per user)

- Limited to front end code only
- no domain name



+ Reasonable entry level cloud ($10)
+ Hosted exclusively in Canada *
+ Nice dashboard

- Scaling can be pricey
- Linux CLI deployment
- Self-managed

END

BACK-END SERVER

-

-

-

Domain Name System

FRAMEWORKS

-

-

-