Absolutely


NO
after instructor
ENTRY


NO CELL
PHONES


DRINKING


No Food


No
Gum

CS 206:Web Programming

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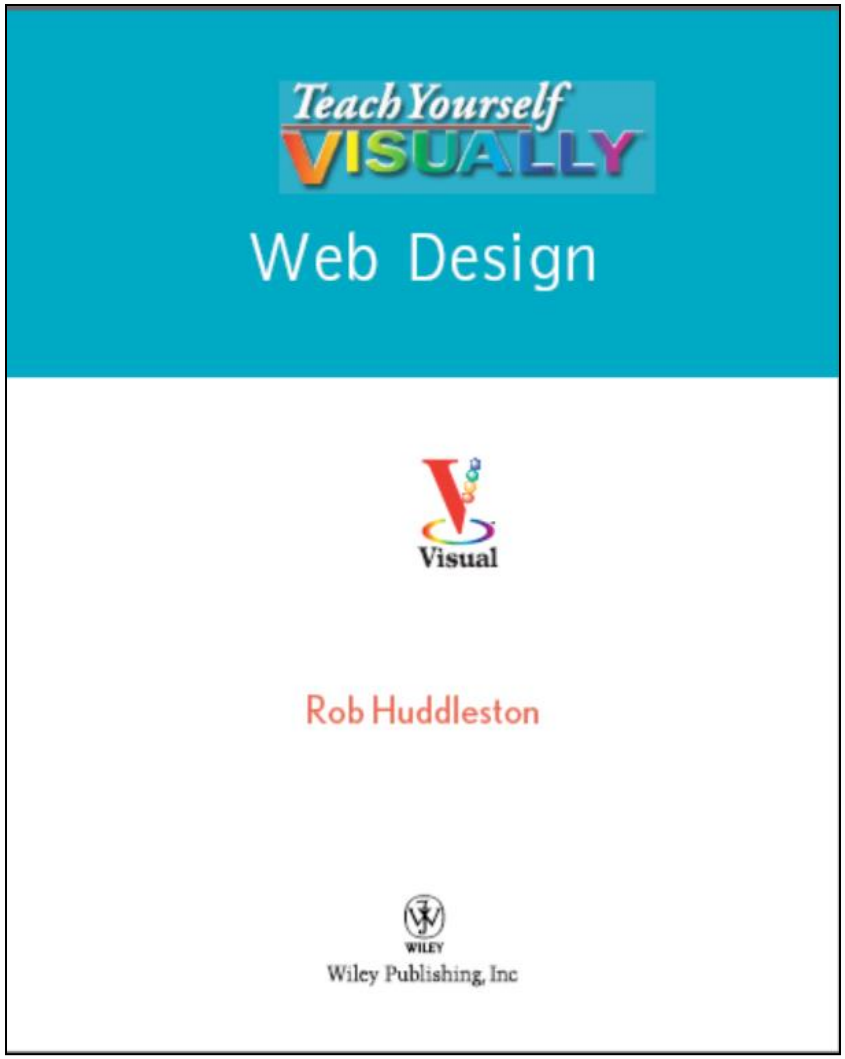
Book Title: Teach Yourself Visually
Web Design

Publisher: Wiley Publishing, Inc., 2011

Author: Rob Huddleston



Useful references

- Mike and Linda Wooldridge, "**Teach Yourself Visually HTML and CSS**", Wiley Publishing, Inc., 2008
- Guy Hart-Davis, "**Teach Yourself Visually HTML and CSS**", John Wiley & Sons, Inc., 2023.
- Ivelin Demirov , "**Learn Java Script Visually**" , 2015.
- Mike Wooldridge, "**Teach Yourself Visually HTML5**" , John Wiley & Sons, Inc., 2011.
- Darren Jones, "**JavaScript: Novice to Ninja**" , SitePoint Pty. Ltd., 2014.

Grading Criterion

Activity	Grade
Midterm Exam	20%
Course Work & quizzes	10%
Practical Exam	10%
Final Exam	60%

Learning Outcomes

On completion of this course we will be able to:

- Describe the concepts of World Wide Web, and the requirements of effective web design.
- Develop web pages using the HTML and CSS features with different layouts as per need of applications.
- Use the JavaScript to develop the dynamic web pages.
- Construct simple web pages in PHP and to represent data in XML format.

Course Schedule & Outline

Serial	Lecture Topic
1	Introduction to Web development
2	Introduction to HTML Web development
3	Introduction to CSS Web development
4	Introduction to JavaScript Web development

Introduction to Web development

Introduction to Web development

Content:

- Web Developer
- Web Application Architecture
- What Is a Web Page?
- Web Page Preview
- What Is a Web Server?
- How Does a Browser Find the Web Server Hosting a Website?
- What Is Responsive Web Design?
- What Is a Responsive Website?
- Static and Dynamic Web Pages
- Tools for Creating Web Pages
- Prepare to Create Your Website
- Create a Folder Structure for Your Website
- How do web pages work?

Web Developer

Full Stack Developer

FRONTEND

Frontend Developer

BACKEND

Backend Developer

DATABASE

Database Engineer

Web Developer

Frontend code : *HTML + CSS + JavaScript*

HTML

Hypertext Markup Language

CSS

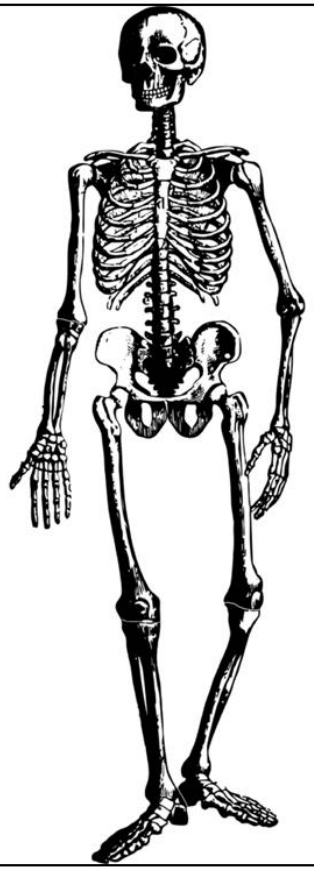
Cascade Style Sheet

JS

Java Script

Web Developer

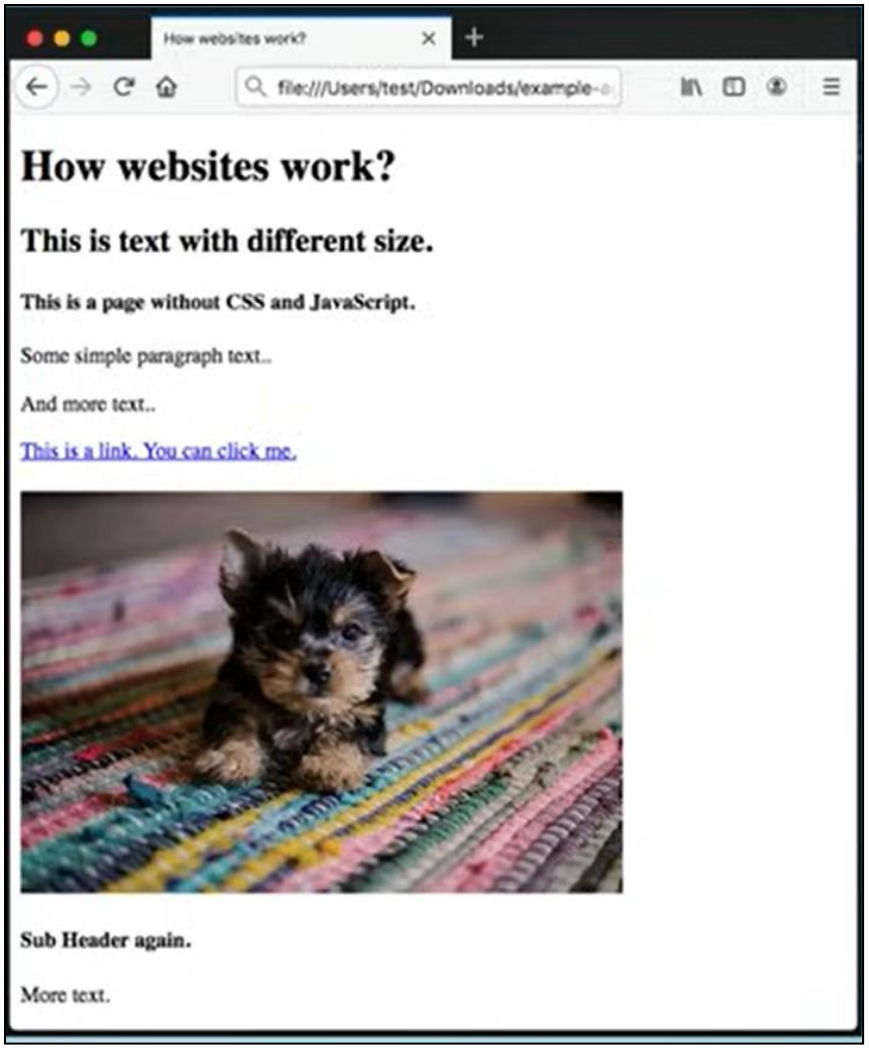
Frontend code : *HTML + CSS + JavaScript*

Content	Structure	Style	Behavior
			
Words and images	HTML	CSS	JavaScript & Server programs

Web Developer

Frontend code : *HTML* + CSS + JavaScript

HTML



- Text, image, link
- Structure of webpage
- No styling

Web Developer

Frontend code : HTML + CSS + JavaScript

- **HTML standards and CSS standards** are developed and maintained by the **World Wide Web Consortium, W3C**, with contributions from many companies and organizations, including the makers of the major browsers.
- **HTML** is the abbreviation for **Hypertext Markup Language**, a language used to create web pages.
- Hypertext means text that includes hyperlinks to other locations on the same page or to other pages, so when you click the linked text, the browser displays the linked location or page.
- HTML enables you to "mark up" text and other elements with codes that specify how the elements appear. For example, you can mark up a paragraph as **a first-level heading** by enclosing it in the appropriate HTML codes, which are <h1> at the beginning and </h1> at the end:

```
<h1>This Is a Heading 1 Paragraph</h1>
```

- Similarly, you can **mark up a paragraph** as being regular "paragraph" text by enclosing it in and codes:

```
<p>This is a paragraph of regular text.</p>
```

- HTML is currently at version 5, which is generally referred to as HTML5. But rather than being a fixed version. HTML5 was first released in January 2008 and went through a major update in October 2014.

Web Developer

Frontend code : HTML + *CSS* + JavaScript

CSS

- Styling of a webpage
- Colors, Fonts, Positioning

Web Developer

Frontend code : HTML + *CSS* + JavaScript

- **CSS** is the abbreviation for **Cascading Style Sheets**, a language used to format web pages written in HTML. CSS enables you to control the visual layout and appearance of web pages, including the fonts, colors, spacing, and positioning used for text and other elements.
- CSS consists of text-based instructions that specify the formatting to apply to particular elements. For example, you could create an h1 style to format the h1 element mentioned in the previous section.
- **You can implement CSS in three ways:**
  - **As an external file,**
  - **As styles embedded in the HTML document, or**
  - **as styles applied inline within a particular HTML tag.**

Web Developer

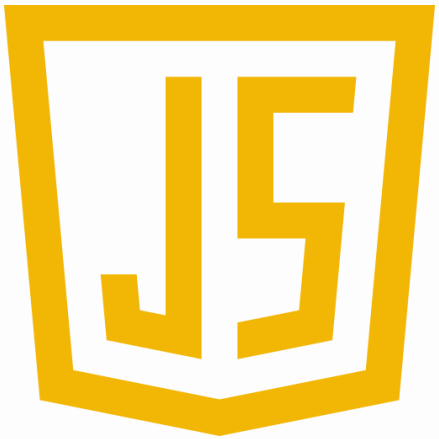
Frontend code : HTML + CSS + JavaScript

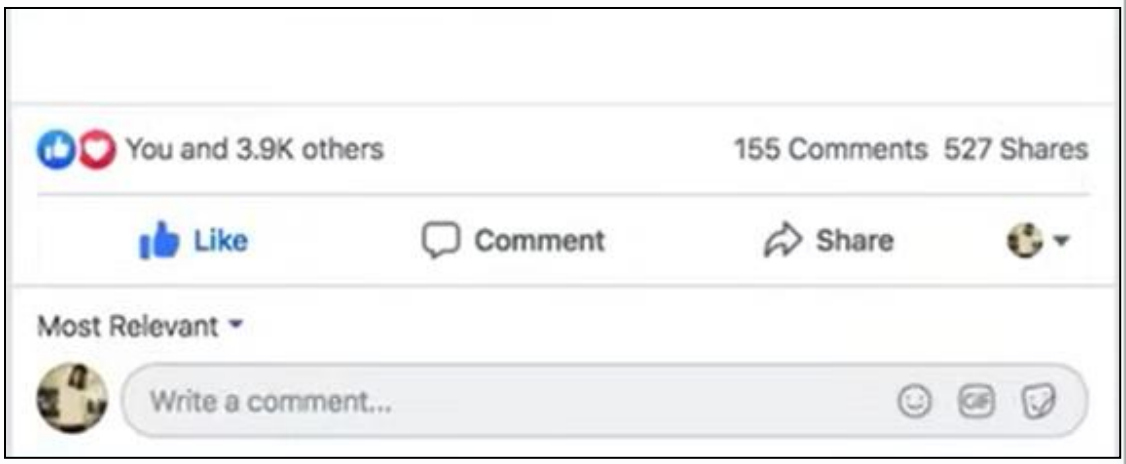
- Using an external file is usually best, because it enables you to format multiple HTML documents using a single style sheet. When you need to make changes, you can change the external CSS rather than having to change the individual documents
- HTML + CSS without JavaScript
  - Static webpage
  - You can't interact with HTML and CSS !
  - Typical websites: visit card websites
  - No Commenting
  - No messaging

Web Developer

Frontend code : HTML + CSS + *JavaScript*

JS





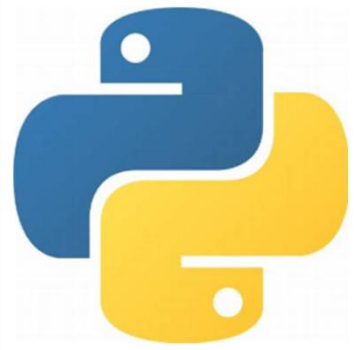
For interacting with the UI = User Interface

- ❑ Upload photo
- ❑ Send message
- ❑ Like picture or comment

Web Developer

Backend code

- "Lives" in the back (NOT in the browser)
- **Makes it available to others**
- **Keep history of messages (data)**
- **Save data to be available later!**
- Can be written in different programming languages



Python

Web Developer

Backend code

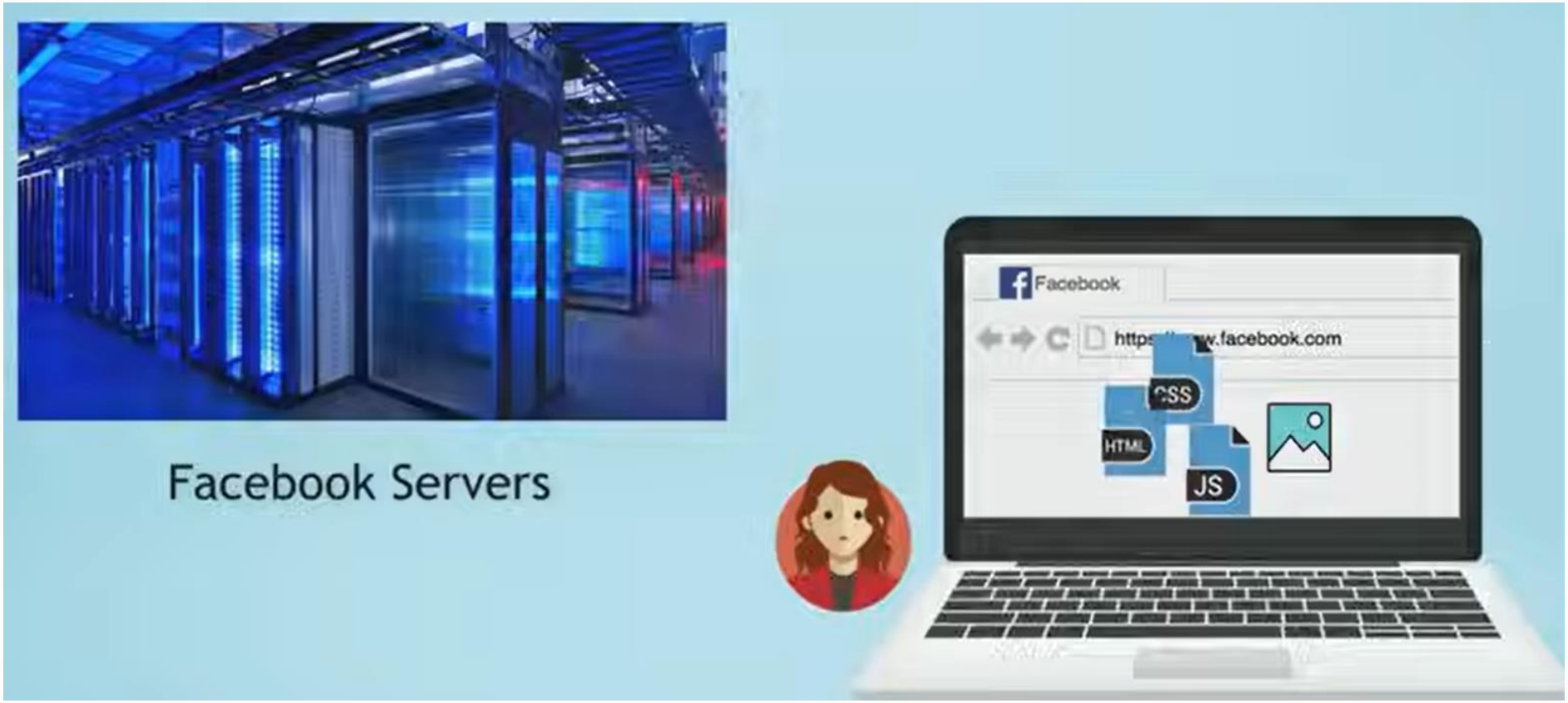
Where do backend code and database "live"?

- Data Centers having a Lots of computers
- Run 24/7
- "Serve" applications

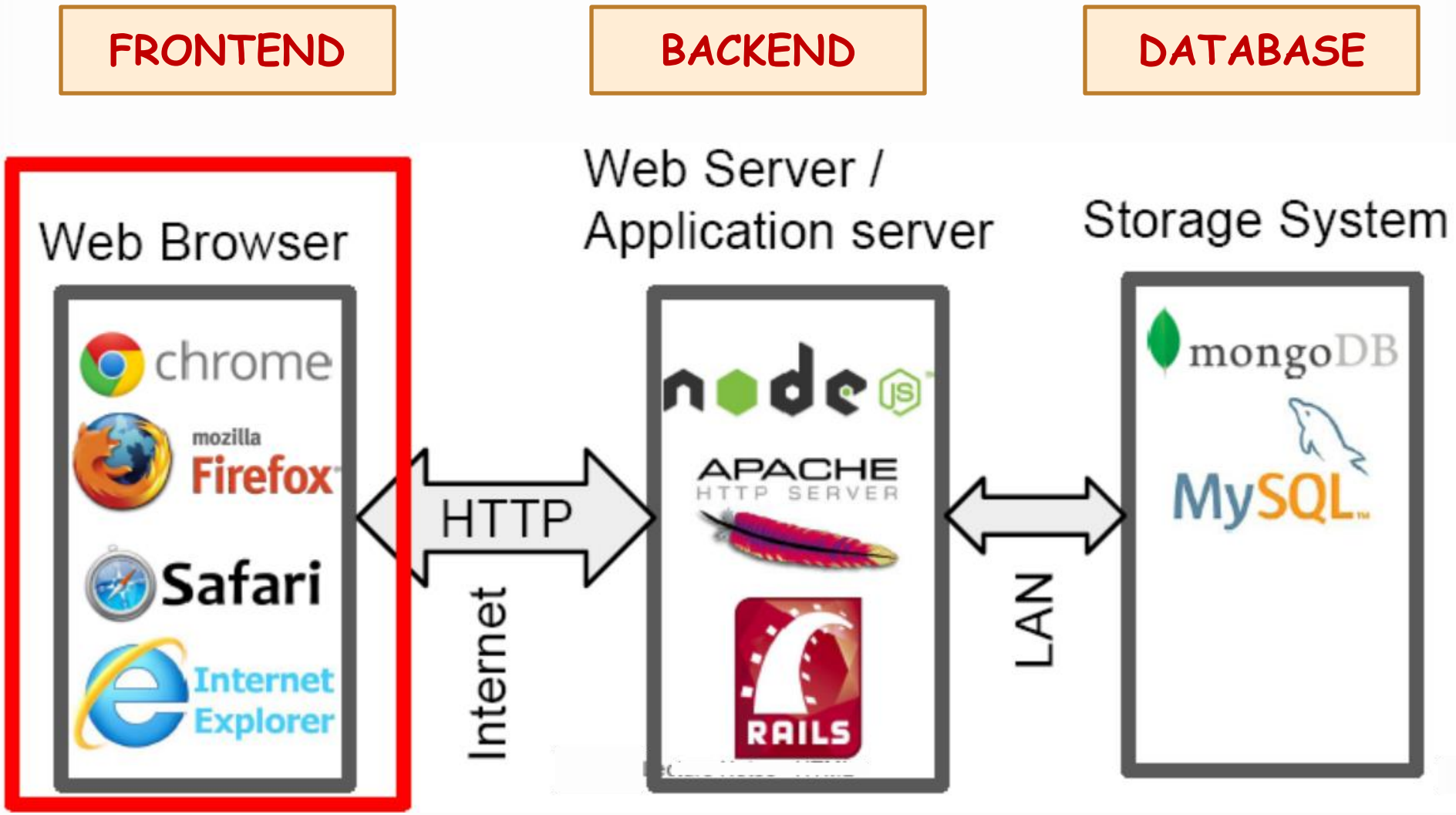
Web Developer

Backend code

How does see your uploaded image?



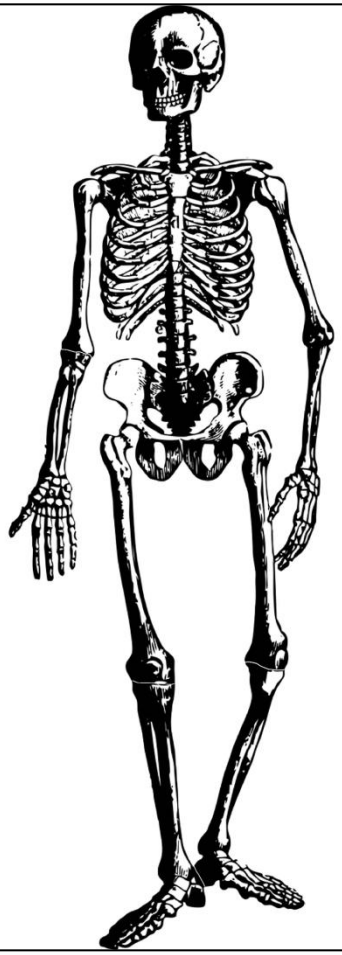
Web Application Architecture



What Is a Web Page?

- *A web page* is a digital document that is accessed through the Web using a web browser app.
- Web pages are components of websites, discussed next, which are hosted on web servers.
- Web pages can contain text, images, audio or video files, and other digital resources, such as documents that visitors can download.
- Web pages are arranged and formatted using Hypertext Markup Language, HTML or short, and Cascading Style Sheets, CSS.
- Web pages contain contents that can be static or dynamic; they may also contain interactive features, such as forms, that enable visitors to input data or interact with the content.

Web Page Preview

Content	Structure	Style	Behavior
			
Words and images	HTML	CSS	JavaScript & Server programs

What Is a Web Server?

- A web server is software that responds to requests from web clients, such as web browsers, and returns content if it is available and permitted.
- A web server stores web pages, images, videos, and other content so that it can serve them to clients.
- A web server can run on almost any computer hardware, from diminutive computers such as the Raspberry Pi series up to dedicated server machines deployed in full-scale facilities called server farms.
- Many web servers are deployed on cloud-based infrastructure, such as Amazon Web Services, AWS, or Microsoft Azure.
- A web server can run on just about any computer operating system, including Windows, mac OS, Linux, and the mobile operating systems iOS, iPad OS, and Android.
- Web servers are a critical part of Internet infrastructure and deliver web content to users throughout the world.

How Does a Browser Find the Web Server Hosting a Website?

- When you enter a website's URL into the browser's address box, the browser uses the Domain Name System, DNS, to discover the Internet Protocol address, or IP address, for the web server hosting the website.
- DNS uses a hierarchical system of servers to organize, store, and return the IP address associated with each domain name.
- A domain name is a text-based identifier that represents a unique location on the Internet. For example, www.sha.edu.eg is the domain name of the website for Shorouk Academy.
- A domain name consists of multiple parts. The rightmost part is the top-level domain, or TLD — in this case, ".eg".
- Moving toward the left, the next part — in this case, ".edu" is the second-level domain. It means that this domain is for educational institute
- Moving toward the left, the next part — in this case, "sha" is the third-level domain.
- The last part, "www", is the subdomain.

What Is Responsive Web Design?

- User may use different types of devices, from desktop computers with huge screens all the way down to tablets and smartphones with comparatively tiny screens.
- This variety of browsing devices means that one-size-fits-all web design is no longer satisfactory for most websites.
- To cater to different devices, website builders use an approach called responsive web design.
- Responsive web design creates pages that can adapt to different device types, different screen sizes, and changes in orientation between portrait and landscape.
- In responsive web design, a web page's layout and content automatically adjust to suit the screen size of the browsing device.

What Is Responsive Web Design?

Advantages or Responsive web design over static

- A responsive web page delivers a consistent user experience across different types of devices rather than favoring some devices over others.
- Second, a responsive web page is easier for visitors to read, navigate, and use.
- Third, a responsive web page improves accessibility, enabling people with disabilities to access it satisfactorily.
- Fourth, a responsive web page can improve search engine optimization, or SEO for short.

What Is a Responsive Website?

- A responsive website is one built to adapt automatically to different screen sizes and resolutions so as to provide a good viewing experience on all devices.
- Your website is likely to attract visitors using desktop computers, laptop computers, tablets, and smartphones, so you should make sure that your website appears in a satisfactory way on different screen sizes, resolutions, and aspect ratios.
- A responsive website uses a CSS feature called media queries to determine the screen size and resolution of visiting devices and to adjust the layout, font sizes, and image sizes to suit the devices.

Responsive vs. Nonresponsive Websites

Responsive	Non-responsive
- A responsive website is a website that checks what type of device is accessing the site and displays its contents in a suitable way for that device.	- A nonresponsive website simply gives each visitor the same type of page, regardless of whether it fits the visiting device or not. - The nonresponsive website does not check to see what type of device is visiting.
- The website's content is consistently usable across different devices using a single codebase. You do not need to create separate websites for different types of devices.	- You need to create separate websites for different types of devices.
- Having a single codebase: ▪ Simplifies developing and updating the website and reduces maintenance costs. ▪ Increase brand recognition and the visitors sharing your website on social media, which may drive extra traffic to the website.	

Static and Dynamic Web Pages

- A static web page is one whose content is fixed and does not change unless the page is edited.
- By contrast, a dynamic web page is one whose content changes as needed.
- Static web pages are well suited to some purposes, and you will likely want to create some static pages for your website. However, it is likely that many of your web pages will benefit from displaying up-to-date information or from responding to a visitor's needs, so you will need to create dynamic pages, too.

Static vs. Dynamic Web Pages

Static	Dynamic
Straightforward to create using HTML and CSS	Require the use of server-side scripting languages such as PHP, ASP, and Java.
suitable for websites that do not need frequent updates or content changes, such as company websites, landing pages, and personal blogs.	Enable to create more interactive and feature-rich websites that can be updated frequently.
More secure than dynamic web pages, because they do not have a database connection that hackers might be able to exploit	Less secure
Can be responsive to adapt to the screen of the device requesting them.	The same
Given a fast Internet connection, static web pages should load quickly for visitors,	Require the server to perform some processing before it can send the web page to the browser.
Less Complex	More complex than static web pages and take more work to create.
	Great for websites that benefit from frequent updating, such as news sites, social media sites, or e-commerce sites.

Tools for Creating Web Pages

- **Text editor** to create HTML, CSS, and JS files
- Code Editors to create HTML and CSS files (**Visual Studio Code or Textpad**).
- Website Builders:
  - Website builders are simplified tools that enable you to build a website by dragging and dropping predesigned elements onto a customizable template.
  - Website builders are good for people or small businesses that want to create a straightforward website quickly and without coding.
  - Widely used website builders include :
    - Weebly, www.weebly.com;
    - Wix, www.wix.com;
    - Squarespace, www.squarespace.com.

Tools for Creating Web Pages

- Content-Management Systems (CMS):
  - CMS is a web-based app for creating, managing, and publishing web pages, blog posts, and images.
  - CMSs provide a wide range of templates for websites, giving you many choices of design and functionality.
  - Widely used CMS platforms: include
    - WordPress, www.wordpress.com;
    - Joomla, www.joomla.org;
    - Drupal, www.drupal.org.
- Graphics Tools:
  - To create image files suitable for your website, you will need a graphics-manipulation tool.
  - GNU Image Manipulation Program (GIMP), which is free and runs on Windows, macOS, and Linux. It is available from www.gimp.org.

Prepare to Create Your Website

❑ Choose a Web Host:

- If you or your company do not have a web host, start by identifying a suitable one and signing up for a hosting plan appropriate to your needs.
- Many web hosts are available. When evaluating web hosts you will normally want to consider the following features:
  - **Price:** select a range of web hosts and plans that you can afford, and then apply the other factors in this list to grade the hosts and plans. Do not judge on price alone in isolation.
  - **Uptime and reliability:** Your website needs to be up, running, and available 24/7 to serve visitors. Choose a web host that offers a high percentage of uptime — 99.9 percent uptime is considered the minimum uptime percentage for dedicated hosts — and high reliability.
  - **Customer support:** Make sure the web host offers strong customer support via all the channels you will want to use — email support, phone support, and live chat support.

Prepare to Create Your Website

❑ Choose a Web Host:

- **Performance and speed:** Web users easily become frustrated with sites that are slow to load, so make sure your web host delivers fast loading speeds. Look for a web host that uses a content delivery network, CDN for short. A CDN is a geographically distributed server system that delivers web content to visitors based on their geographical location rather than delivering all content from a central point that may be geographically distant from some visitors.

- **Scalability:** Make sure the web host enables you to upgrade your hosting plan as your website and its traffic grow. Such scalability helps you avoid outgrowing your web host and having to move to another host, which is a major and expensive upheaval.

- **Security, backup, and recovery:** The web host should provide SSL certificates, malware detection, and firewalls to keep websites secure. The host should also offer set-and forget backup features to keep your website's data protected in case of corruption or hardware failure, plus easy-to-use tools for recovering your website from the latest viable backup.

Prepare to Create Your Website

❑ Choose Domain Name:

- ❖ **Domain** is the name of a website.
- ❖ Websites can be identified with IP addresses, but those aren't convenient for humans to remember, so domains are used to make it easier to keep track of website names.
- ❖ An example of what a domain name looks like :

  www.sha.edu.eg

- ❖ A **subdomain** is a prefix added to a domain name to separate a section of your website. Site owners primarily use subdomains to manage extensive sections that require their own content hierarchy, like :

  www.learn.sha.edu.eg

Prepare to Create Your Website

Register a Domain Name:

- Open a browser window to a domain registrar, search to identify an available domain name that suits you, and register it. The nearby illustration shows the registration interface at Pair Domains.
- These are five of the leading domain registrars:
  - GoDaddy, www.godaddy.com
  - Domain.com, www.domain.com
  - Namecheap, www.namecheap.com
  - Google Domains, www.domains.google
  - Porkbun, www.porkbun.com

Prepare to Create Your Website

❑ Choose a Type of SSL Certificate:

- ❖ SSL stands for Secure Sockets Layer, a networking security protocol used to establish an encrypted link between a web browser and a web server, ensuring that all data passed between them remains private and secure even if it is intercepted in transit.
- ❖ To make sure that browsers can access your website safely, you will need to get an SSL certificate and apply it to the website's domain.
- ❖ You have many options for getting an SSL certificate:
  - ➢ First, you can get an SSL certificate from your domain registrar when you register the website's name.
  - ➢ Second, many web hosts offer SSL certificates for the domains you host on their servers.
  - ➢ A third option is to get an SSL certificate from a different domain registrar, but this is not recommended.

Prepare to Create Your Website

❑ Choose a Type of SSL Certificate:

- Various types of SSL certificates are available, such as the following:
  - **A trial certificate:** is a time-limited certificate that enables you to test whether the certificate meets your needs; if it does, you can buy another certificate to replace it.
  - **A positive certificate:** enables encryption for your website's data and has a relatively small relying party warranty.
  - **A basic certificate:** also enables encryption but has a much higher relying party warranty.
  - **A positive wildcard certificate:** enables encryption for multiple **subdomains** within your domain, so you do not need to buy a separate certificate for each subdomain.

Create a Folder Structure for Your Website

- **The following types are widely used, but your website may well have others:**
  - HTML documents and CSS files
  - Images
  - Fonts
  - Audio files and video files
  - JavaScript script files
  - Documentation files about the website
  - Reusable code and templates

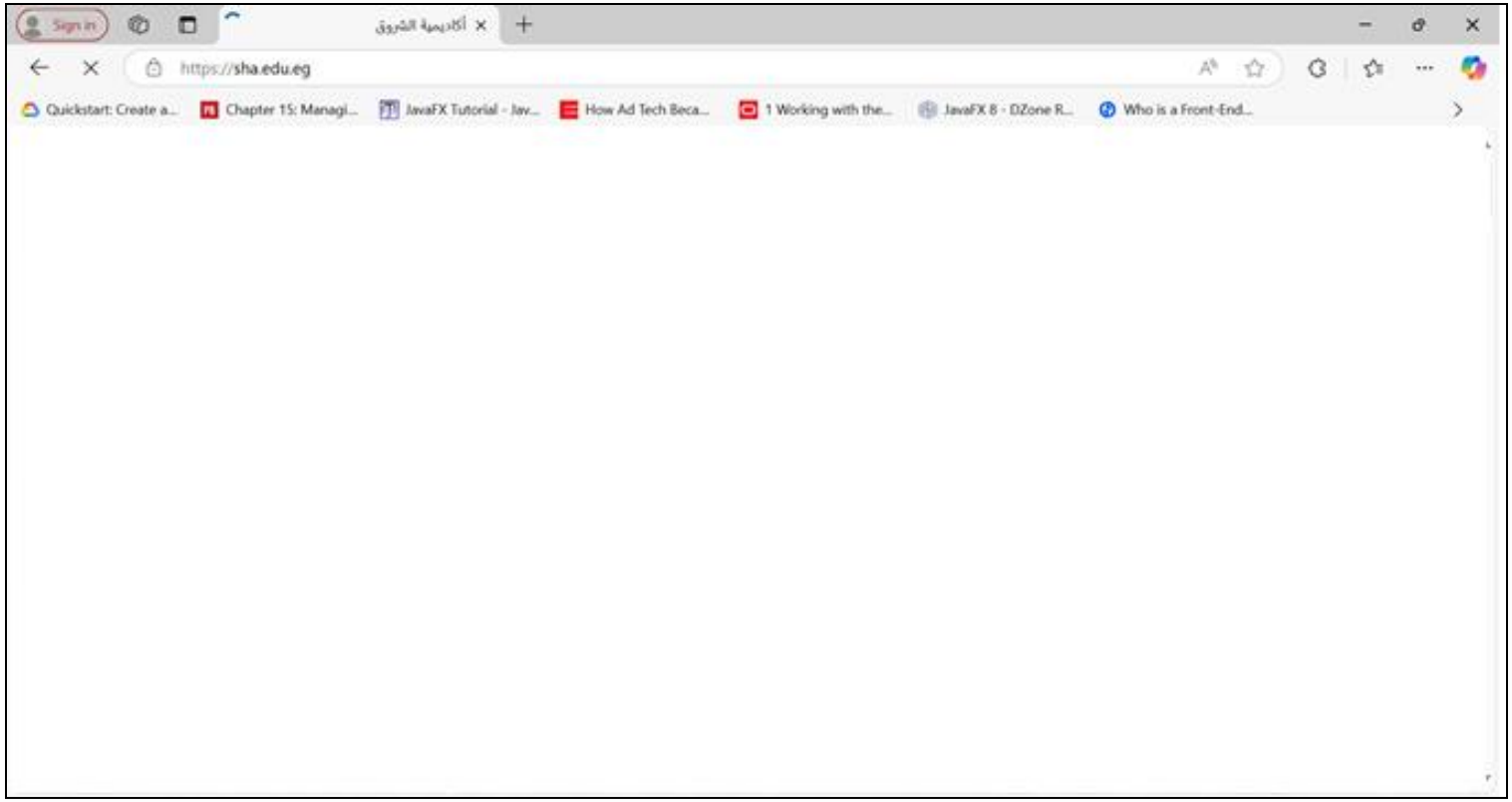
Create a Folder Structure for Your Website

❑ Directories Your Website Will Need:

Folder	Explanation
/	The root directory, the top level of the website. You will put the main index.html file, your web pages, and other essential files, such as a robots.txt file, in this directory. The other directories are children of the root directory
/css	The directory for storing the CSS files you use to style your web pages. If you have many CSS files, consider creating subdirectories to organize them more tightly.
/docs	The directory for storing documentation files.
/download	The directory for storing files your website makes available for download.
/fonts	The directory for storing font files the website uses
/images	The directory for storing image files.
/includes	The directory for storing templates or reusable code.
/js	The directory for storing JavaScript script files.
/vendor	The directory for storing third-party frameworks or libraries your website uses

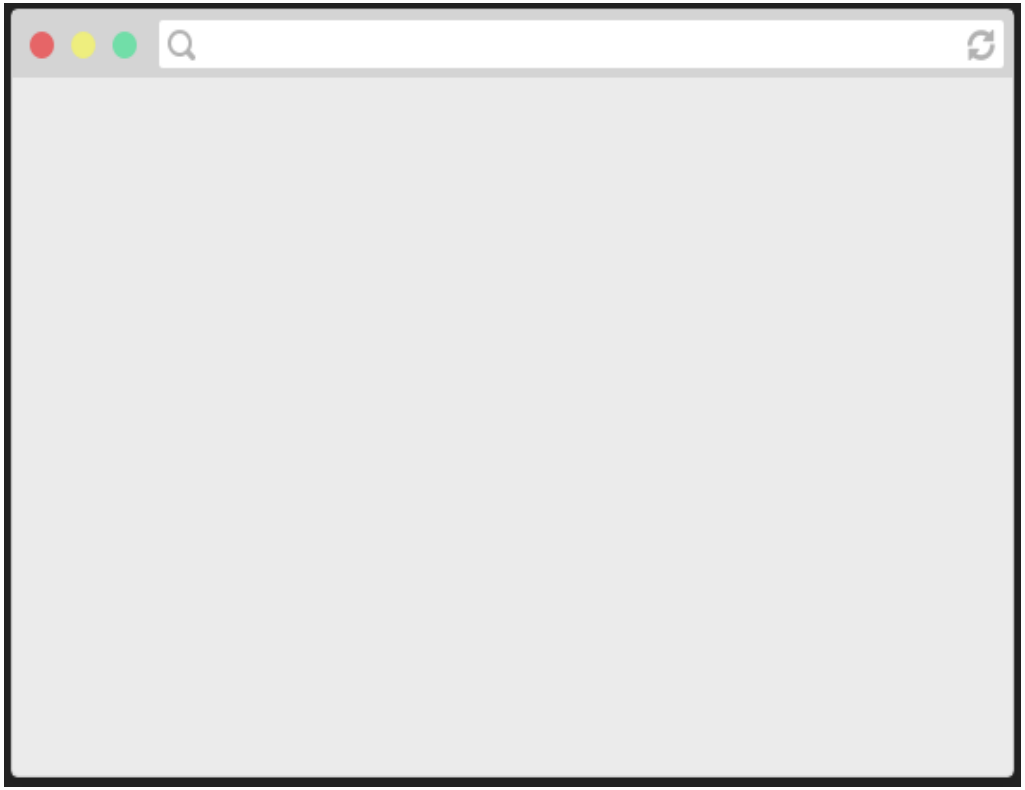
How do web pages work?

- Browsers applications that can display web pages.
- E.g. Chrome, Firefox, Safari, Edge, etc.



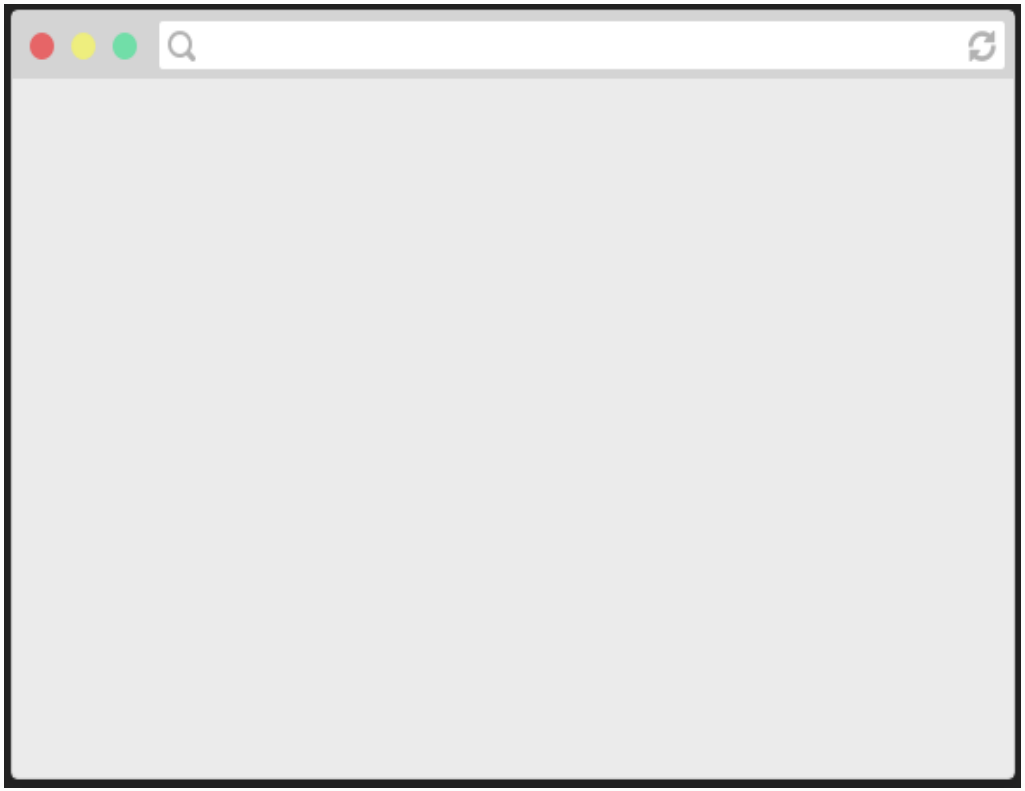
How do web pages work?

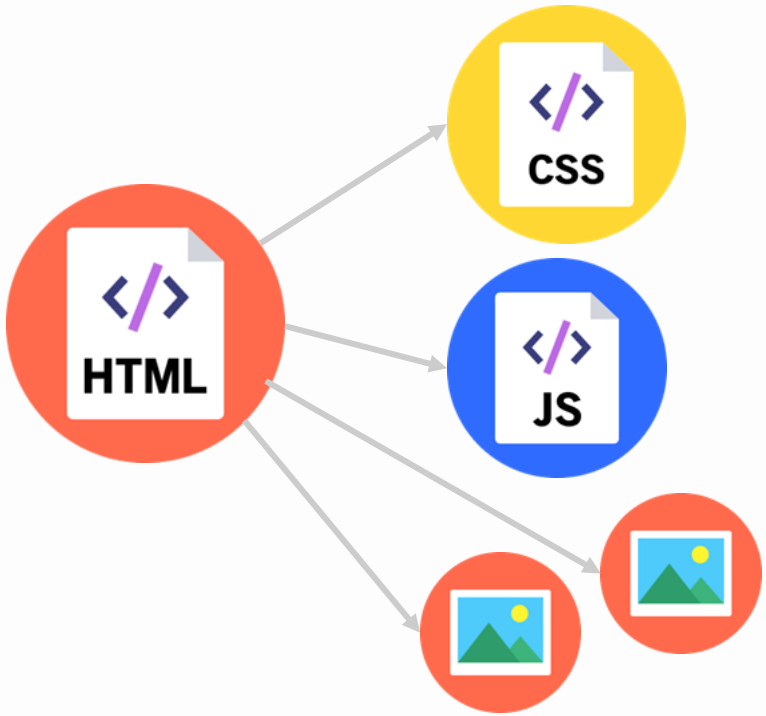
Web pages are written in a markup language called **HTML**, so browsers display a web page by reading and interpreting its HTML.



How do web pages work?

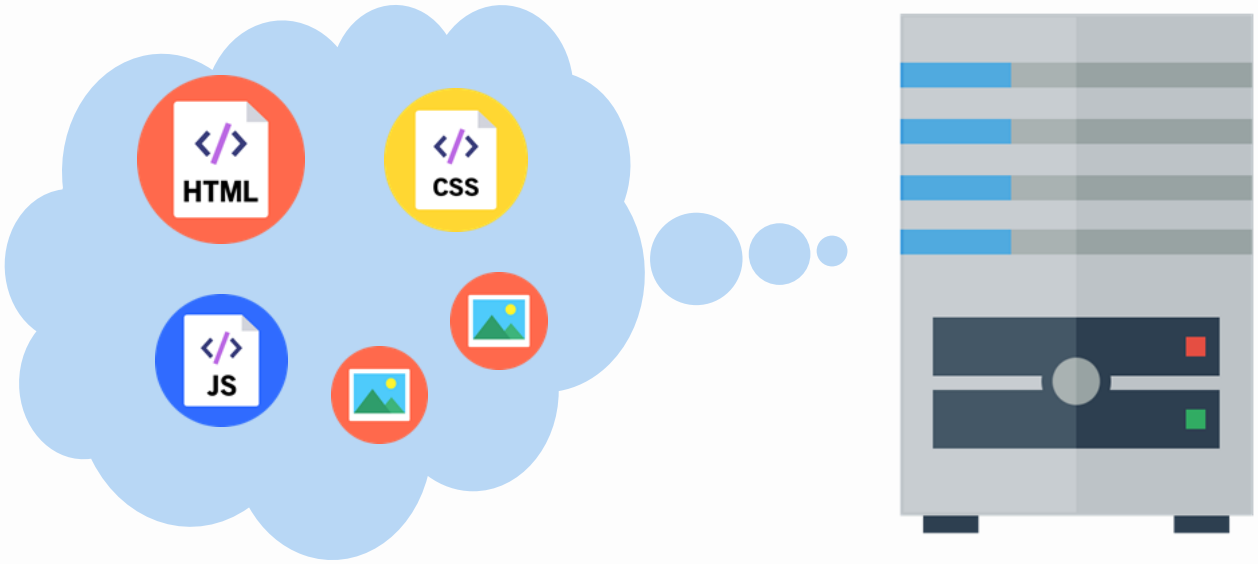
The **HTML** file might link to other resources, like images, videos, as well as **JavaScript** and **CSS** (stylesheet) files, which the browser then also loads.





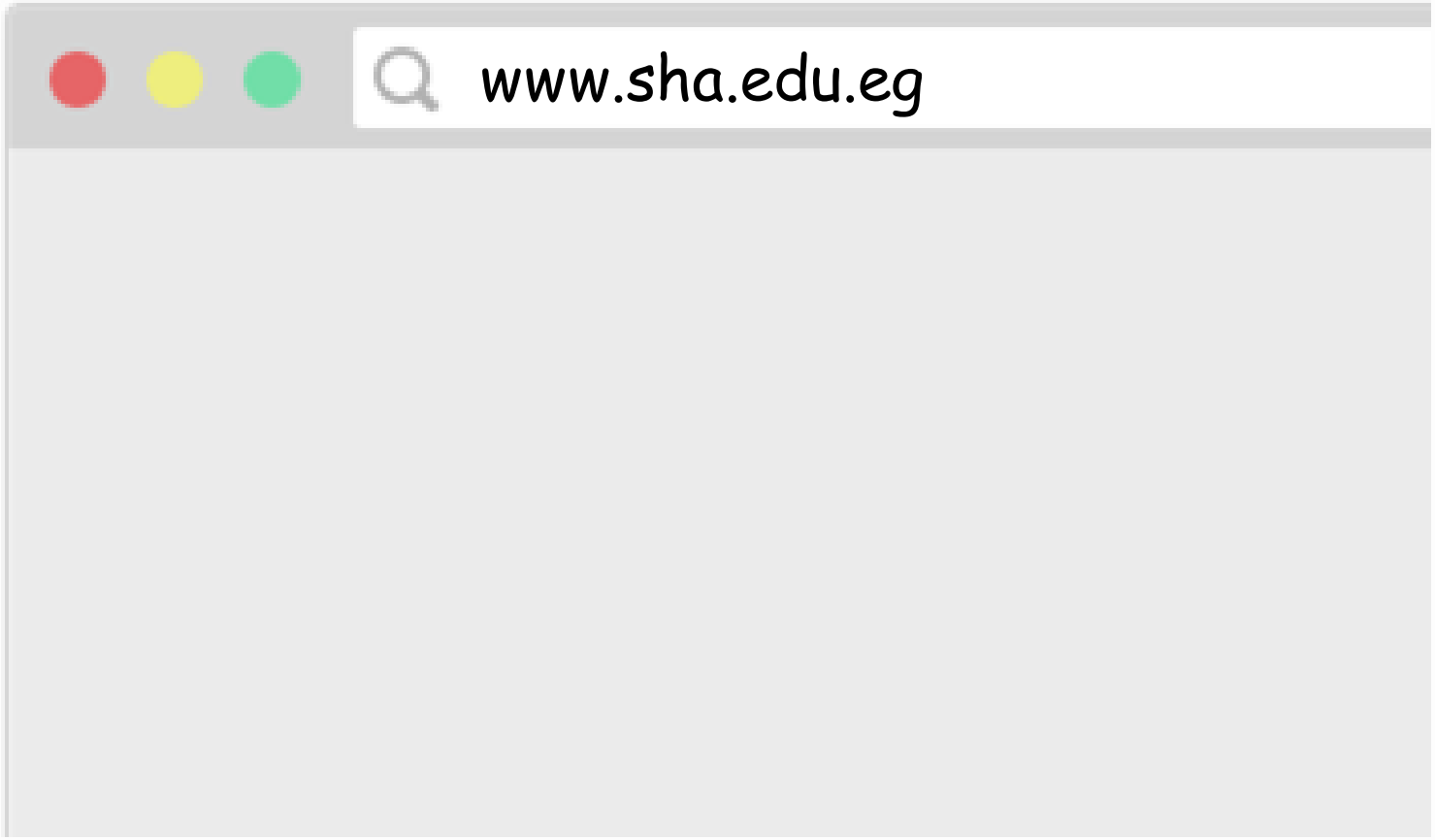
How do web pages work?

- A **web server** is a program running on a computer that delivers web pages in response to requests.
- It either stores or generates the web page returned.



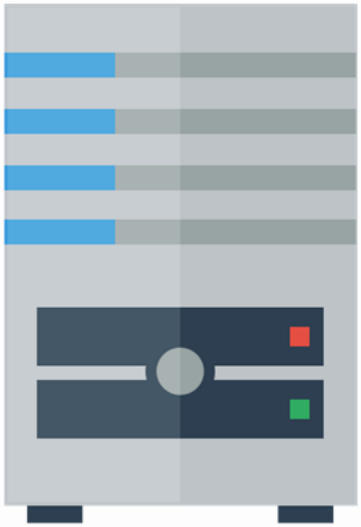
How do web pages work?

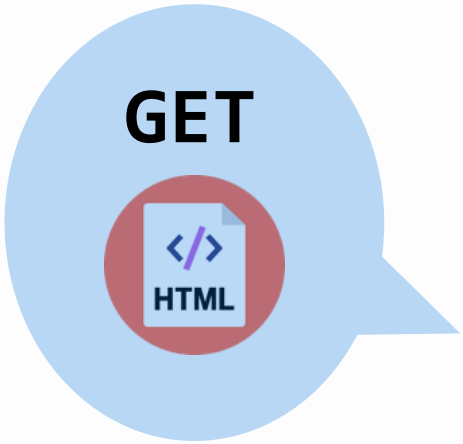
- You type in a URL, which is the address of the HTML file on the internet.

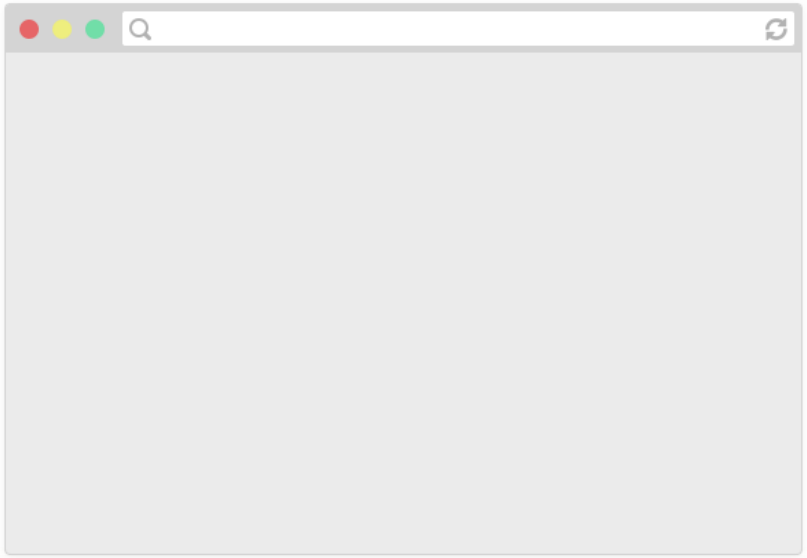


How do web pages work?

- The browser asks the web server that hosts the document to send that document.

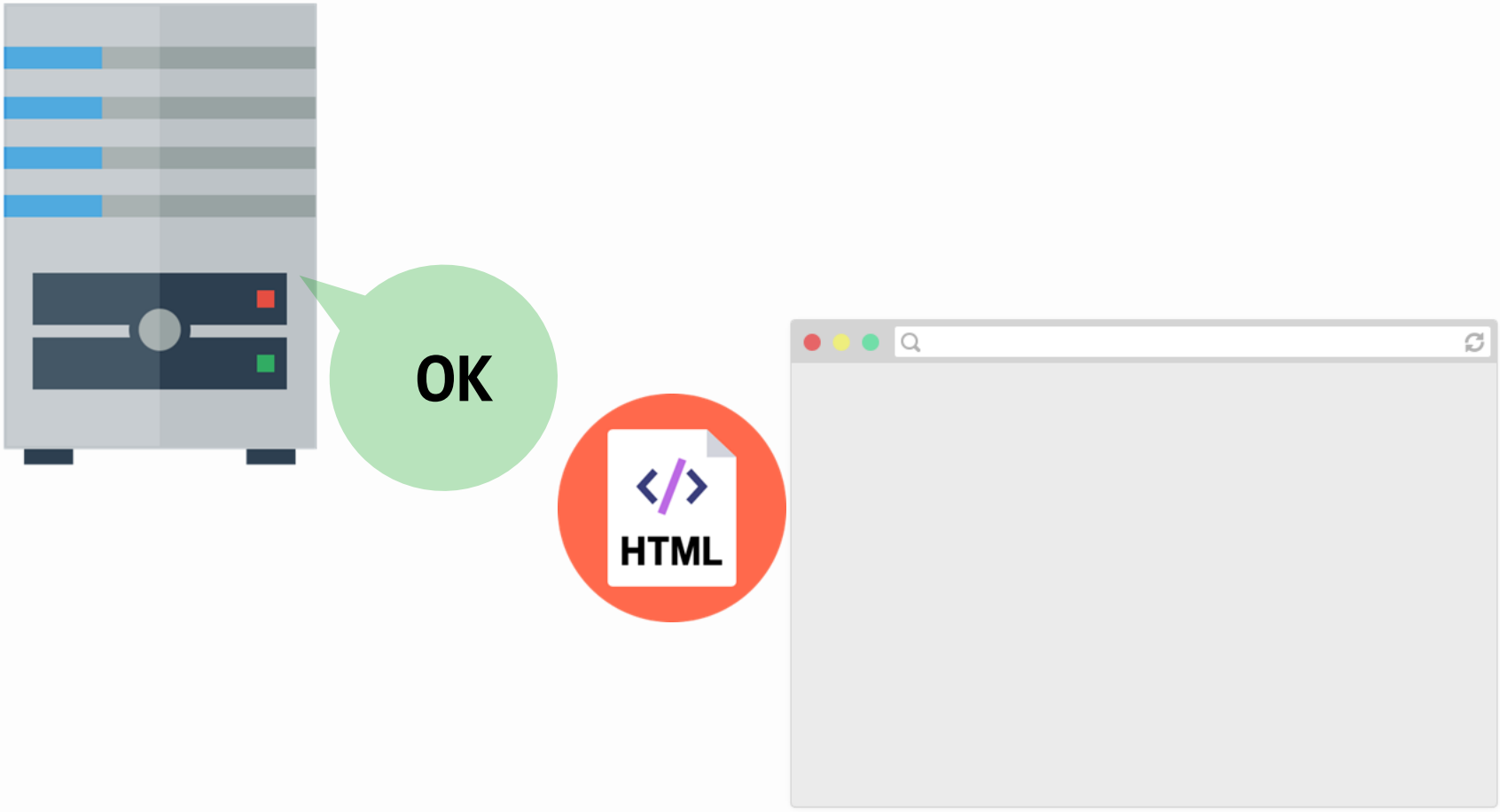






How do web pages work?

- The web server responds to the browser with HTML file that was requested.



How do web pages work?

- The browser reads the HTML, sees the embedded resources and asks the server for those as well.

How do web pages work?

- The web page is loaded when all the resources are fetched and displayed.