



Introduction to Web Development



Welcome



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Lecture – Housekeeping

- ❑ The use of disrespectful language is prohibited in the questions, this is a supportive, learning environment - please engage accordingly.
- ❑ No question is daft or silly - **ask them!**
- ❑ There are Q/A sessions midway and at the end of the session, should you wish to ask any follow-up questions.
- ❑ You can also submit questions here:
hyperiondev.com/sbc4-cs-questions
- ❑ For all non-academic questions, please submit a query:
www.hyperiondev.com/support
- ❑ Report a safeguarding incident:
hyperiondev.com/safeguardreporting
- ❑ We would love your feedback on lectures:
<https://hyperiondev.wufoo.com/forms/zsgv4m40ui4i0g/>

Previously:

- Explored networking beyond OSI model
- Network Types, Topologies, Protocols, Devices.
- Relevance in CyberSecurity

Objectives

- Define Web Development
- Explore Front-End Developments and common Cyber-Risks
- Explore Back-End Developments and associated risks
- Note some differences between the above :)

What is Web Development

- The process of developing and creating web-based applications, which can range from straightforward webpages to sophisticated e-commerce systems, is known as web development.
- Because it produces the applications that hackers/attackers are most interested in, web development is vital to the topic of cyber security.

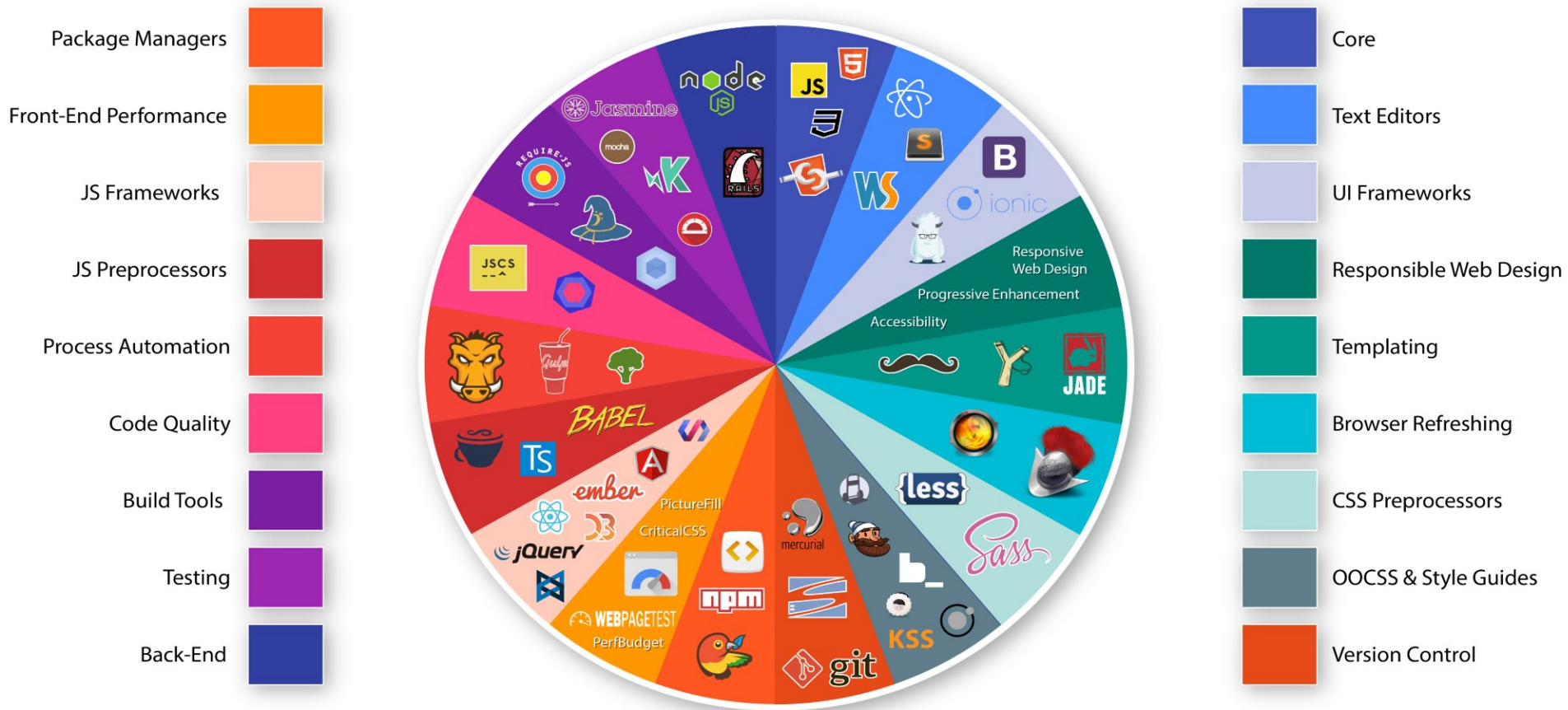
Basics of Web Development

- It's crucial to utilize simple, understandable language when creating online apps so that everyone can use them, regardless of their background or skill level.
- Additionally, web developers should aim to make their applications as accessible as possible to a diverse range of users, including those with disabilities. This can involve writing code that complies with accessibility standards, such as those set by the Web Accessibility Initiative (WAI).
- Finally, web developers should implement **privacy-enhancing** technologies, such as **encryption** and **secure data storage**, to protect user privacy and uphold the individual liberty of clients/users.

Front-end

- Front-end development refers to the process of designing and building the user-facing parts of a web application. It is important to design user interfaces that are intuitive and easy to use.
- Additionally, implementing secure login systems that protect user privacy and prevent cyber attacks is crucial for upholding the British value of the rule of law.

THE FRONT-END SPECTRUM



Back-end Development

- Back-end development is the process of planning and constructing the database structures and server-side logic that underpin a web application. It is crucial to create database architecture and server-side logic that can withstand common web-based assaults.
- The server for the applications is located in the backend. It includes the technical elements required to keep the application operating. Think of it as the powerhouse for most Front-End Functionality
- Access control implementation is essential to guarantee that web applications are utilized properly and morally.



**System
architecture**



Servers



Database



Data analysis



Security



Frameworks



Scalability



**Operating
system**



Business logic



APIs

BACKEND IS:

Front-end Risks

- **The XSS Attack**

In a cross-site scripting (**XSS**) attack, an attacker inserts malicious scripts into a reliable website. The attacker then continues by sending you malicious codes that impersonate your browser's side script.

- **Attacks Using CSS Injection**

In a CSS injection attack, an arbitrary CSS code is added to a reliable website, and your browser displays the compromised file.

- **Cross Site Request Forgery**

Using your login credentials to authenticate on a website, an attacker can trick you into performing harmful actions. This is known as cross-site request forgery (**CSRF**). The majority of attacks of this nature use download forms.

Back-end Risks

- **Data injection**

Utilizing queries to break into your web application servers is known as data injection. Your system is queried by online attackers who want to retrieve sensitive information. Your system processes the query blindly and gives the attackers the requested information in the absence of safeguards to verify the query's authenticity and source.

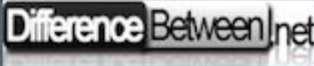
Access Control Misconfigurations

- You can grant different categories of access to users of your web applications using access control levels (**ACLs**). It is normal for team members to have more access to your web applications than typical users. Nobody other than your team should have access to the private information in your web applications.

Software configuration errors


- The efficiency of your backend security is essential for the operations of your web applications. The front end could break down due to backend configuration errors, exposing your sensitive data.

FRONTEND VERSUS BACKEND


Frontend	Backend
Frontend refers to the client-side of the application.	Backend refers to the server-side of the application.
It is the part of the website users can see and interact with.	It constitutes everything that happens behind the scenes.
It typically includes everything that attributes to the visual aspects of websites.	It generally includes a web server that communicates with a database to serve requests that the frontend presents.
It forms the basis of what users can touch and experience on their web browsers.	It is the brain of the website that is never visible to the end users.
The essentials of frontend web development include HTML, CSS, and JavaScript.	The essentials of backend development include Ruby, Python, Java, .Net, etc. 



Question:



Do SQL injections target the
Back-End or **Front-End** of a Web
Application?



Wrapping Up.

- We've discussed the fundamentals of web development, cybersecurity, and the significance of producing moral and ethical web applications. We have also talked about how the fields of web development and cybersecurity might benefit from ideals like individual liberty, equality, respect for others, and the rule of law.
- As their work can have important social and political repercussions, web developers must uphold these ideals when creating and designing web apps. We may contribute to the development of a more secure and democratic online environment by developing web apps that are easily accessible, secure, and preserve user privacy and the rule of law.

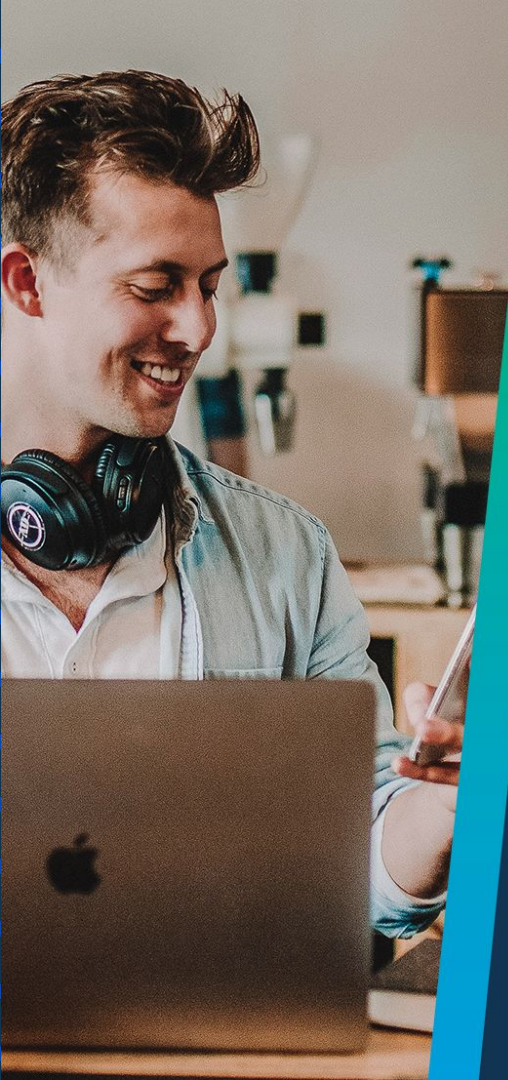
Next up

- Cryptographic Ciphers!



Questions and Answers





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Thank you for joining us

1. Take regular breaks
2. Stay hydrated
3. Avoid prolonged screen time
4. Practice good posture
5. Get regular exercise