

CAP785:WEB PERFORMANCE OPTIMIZATION

L:3 T:0 P:2 Credits:4

Course Outcomes: Through this course students should be able to

CO1 :: understand how to increase web performance by using various techniques

CO2 :: analyze websites for higher conversions and better user satisfaction

CO3 :: evaluate the performance of web resources using various metrics

CO4 :: construct websites for better user engagement and better ranking

Unit I

Understanding web performance : introduction to web performance, getting up and running, auditing the client's website, optimizing the client's website, performing the final weigh-in

Using assessment tools : evaluating with Google PageSpeed Insights, using browser-based assessment tools, inspecting network requests, rendering performance-auditing tools, benchmarking JavaScript in Chrome, simulating and monitoring devices, creating custom network throttling profiles

Unit II

Optimizing CSS : introduction to CSS optimization, mobile-first is user-first, performance-tuning your CSS, working with CSS transitions

Understanding critical CSS : introduction to critical CSS, implementing critical CSS, weighing the benefit, making maintainability easier, considerations for multipage websites

Unit III

Making images responsive : Introduction to image delivery, understanding image types and their applications, image delivery in CSS, image delivery in HTML

Going further with images : using image sprites, reducing images, encoding images with WebP, lazy loading images

Unit IV

Faster fonts : using fonts wisely, compressing EOT and TTF font formats, subsetting fonts, optimizing the loading of fonts

Keeping JavaScript lean and fast : affecting script-loading behavior, using leaner jQuery-compatible alternatives, getting by without jQuery, animating with requestAnimationFrame method

Unit V

Boosting performance with service workers : introduction to service workers, writing your first service worker, updating your service worker

Fine-tuning asset delivery : compressing assets, caching assets, using CDN assets, using resource hints

Unit VI

Looking to the future with HTTP/2 : need for HTTP/2, optimization techniques for HTTP/2, sending assets preemptively with server push, optimizing for both HTTP/1 and HTTP/2

Automating optimization with gulp : introduction to gulp, laying down the foundations, writing gulp tasks, working with gulp plugins

List of Practicals / Experiments:

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- Minifying assets
- Installing Node.js and Git
- Using Google Analytics for bulk reporting
- Benchmarking JavaScript in Chrome
- Debugging websites remotely on Android devices
- Working with SVG images
- Targeting displays in CSS by using media queries
- Using SVG in HTML

- Working with image sprite
- Subsetting fonts
- Animating with requestAnimationFrame method
- Creating a service worker
- Caching assets
- Sending assets preemptively with Server Push
- Creating a gulp task

Text Books:

1. WEBSITE OPTIMIZATION: AN HOUR A DAY by RICH PAGE, SYBEX

References:

1. WEB PERFORMANCE IN ACTION: BUILDING FASTER WEB PAGES by JEREMY WAGNER, Manning Publications
2. WEB PERFORMANCE DAYBOOK by STOYAN STEFANOV, O'REILLY
3. HIGH PERFORMANCE WEB SITES by STEVE SOUDERS, O'REILLY