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Methods 2
Hunter Advanced Certification Program
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Methods 2 Final Project - Lesson Plan
Aim: How can we efficiently update our HTML pages with changes to a single CSS file, and what does this process teach us about key computer science principles?

New York State Standard:
9-12.CT.6: Demonstrate how at least two classic algorithms work, and analyze the trade-offs related to two or more algorithms for completing the same task.

Materials:

- Slide Deck: https://docs.google.com/presentation/d/1RfChThEZNHYiWdSLTkWYutgsRRlG8xTApU9y0YtG5v0/edit?usp=sharing
- Shared repl.it with four HTML files, a CSS file, and a JavaScript file: *https://replit.com/@alexmoore77/DemoHTML#index.html*

Rationale: I want to teach basic Web development in my AP Computer Science Principles course in a way that is aligned with the curriculum, is sufficiently rigorous, and prepares students for The AP Exam.

Do Now/Warm Up: In three minutes in our small class chat, describe a time when you had to do something inefficiently.
Next, share out!

Teacher-delivered Content:

- Assignment #1: Assuming prior knowledge of basic HTML, which we have learned prior to this lesson, do the following in ten minutes:
    1) Go to this URL: https://replit.com/@alexmoore77/DemoHTML#index.html
    2) Fork the project so you can edit your own copy.
    3) On each of the four HTML pages, change the font color of <h1> to green and the background color to yellow.
- Introduction to a CSS file: body, h1, p
- Algorithmic Efficiency and Big O Notation - How can CSS be a more efficient way of handling styles than hard coding, and what should we know about algorithmic efficiency and Big O Notation?
    - Constant time - O(1), linear time - O(n), quadratic time - O(n^2), logarithmic time O(log n)
    - Question 1: How can we measure the efficiency of algorithms in computer science?
    - Question 2: What is Big O Notation?
    - Question 3: If it takes us one minute to update each HTML file, and it takes one minute to update a CSS file, how can we describe the efficiency of using CSS to

update styles instead of updating them in HTML?

- Variable Scope - How can CSS set values for tags across all HTML files, and what should we know about variable scope?
    - Local variables, global variables
    - Question 1: What is a local variable?
    - Question 2: What is a global variable?
    - Question 3: Is setting the styles for all HTML tags in a directory with CSS similar to setting global variables? Why or why not?
- Networking-How does an HTML file that has been styled with CSS reach your computer, and what should we know about networking?
    - IP, TCP, packets, DNS, HTTP
    - Question 1: What happens with packets on The Internet?
    - Question 2: Is a website on the World Wide Web, the Internet, or both?
    - Question 3: What Internet protocols are used when a page styled with CSS is accessed on a client computer?
- Abstraction- How does the use of CSS style sheets add a layer of abstraction to our project, and what should I know about abstraction?
    - high level languages, low level languages, abstraction, data abstraction, procedural abstraction
    - Question 1: What is abstraction in Computer Science?
    - Question 2: Is a social media like button an abstraction?
    - Question 3: Could we say that using CSS is adding a layer of abstraction to our Web development projects?

Exercise/Assignment with Differentiation:

Assuming prior knowledge of basic HTML, which we have learned prior to this lesson, do the following for homework:

1) Go to this URL: https://replit.com/@alexmoore77/DemoHTML#index.html
2) Fork the project so you can edit your own copy.
3) Select one task below, and submit your work.
    a) Mild: Update the CSS file to change the font color of <h1> to green and the body background color to yellow on all four HTML pages.
    b) Medium: Update the CSS file to change the display of the links so that they are blocky and change color when moused over.
    c) Spicy: Update the CSS file to improve the layout of each page.