



**UTM**  
UNIVERSITI TEKNOLOGI MALAYSIA

**SECV2223-02 PENGATURCARAAN WEB  
(WEB PROGRAMMING)  
SEMESTER II (2023/2024)**

**ASSIGNMENT 1**

Comparative Evaluation of Websites  
Related To AI Domain

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## 1.0 List of websites from AI domain

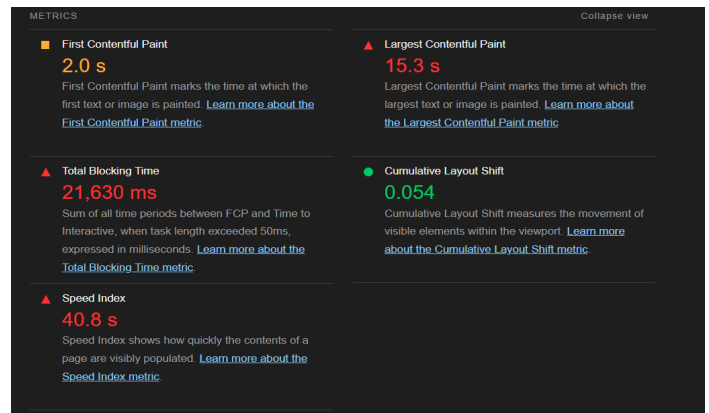
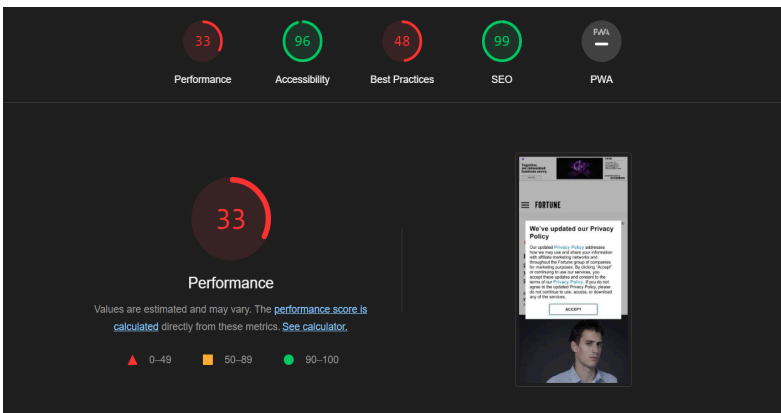
For the purpose of this evaluation, the following websites from the AI domain have been selected:

1. Fortune - Europe's Generative AI Race and Funding
2. Bloomberg - Electric Utilities' Response to AI Data Center Demand
3. CNBC - Adobe's AI Assistant for Acrobat
4. Business Insider - Tech Stocks Outlook on AI Investing
5. Entrepreneur - Wearable AI Pin as a Smartphone Alternative
6. Forbes - Keeping AI Projects in Check: Scoping AI Projects

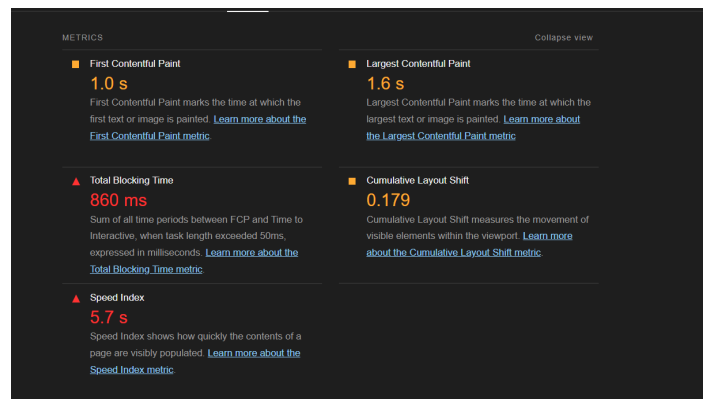
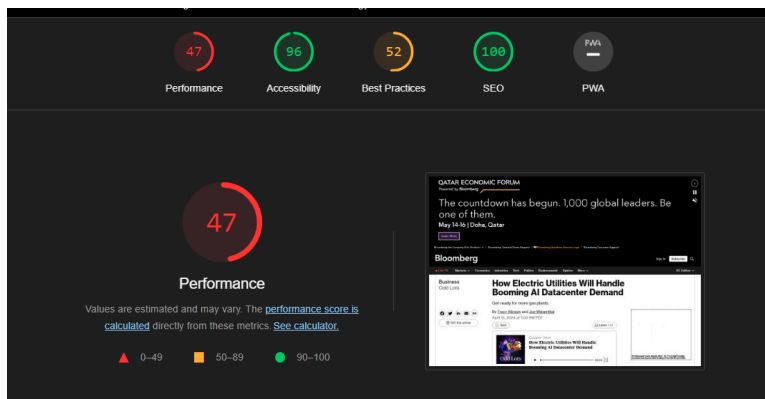
These websites will be assessed using Lighthouse to provide insights into their performance, accessibility, best practices, and SEO in the AI domain.

## 2.0 Performance Reports

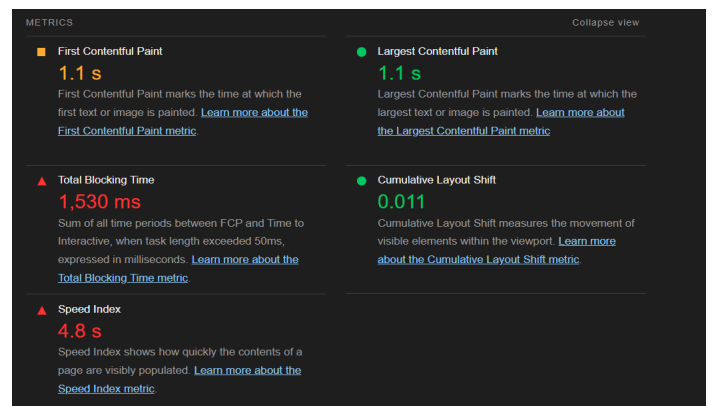
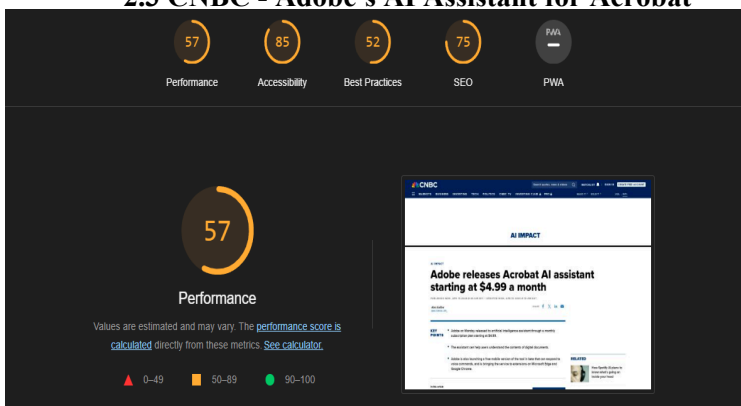
### 2.1 Fortune - Europe's Generative AI Race and Funding



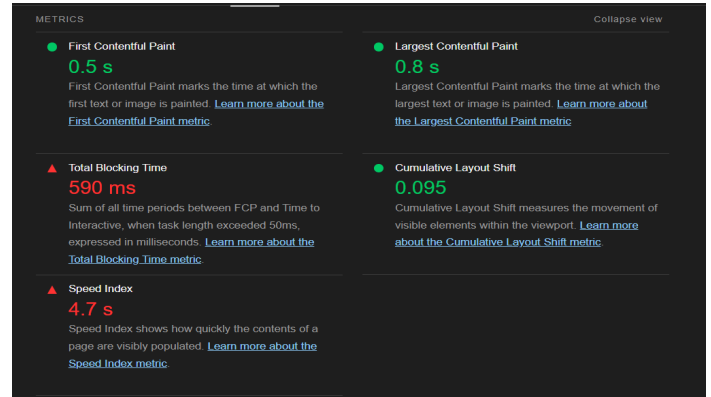
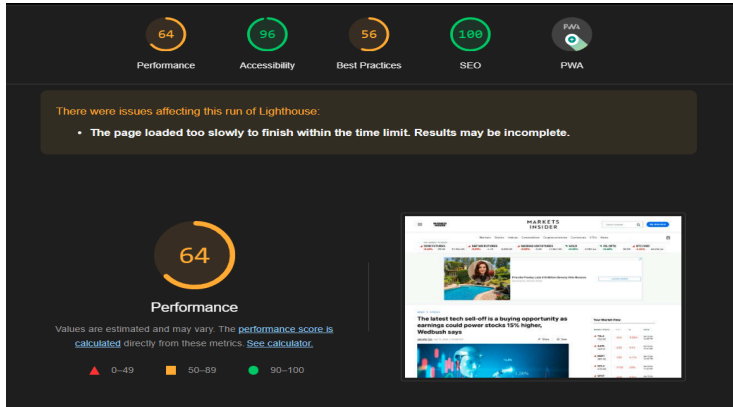
### 2.2 Bloomberg - Electric Utilities' Response to AI Data Center Demand



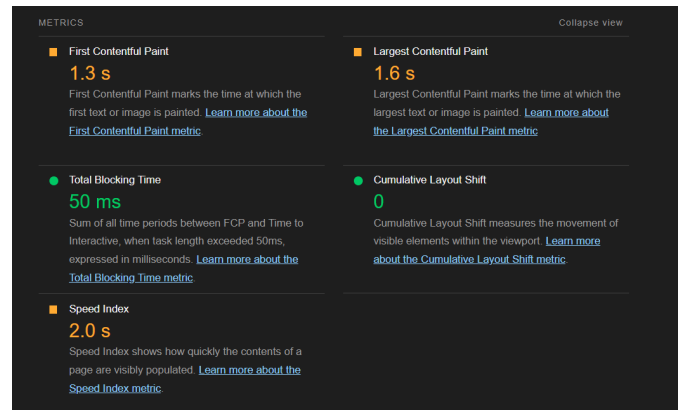
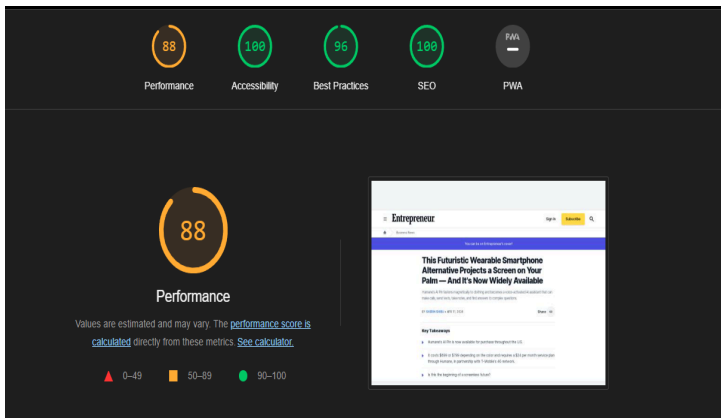
### 2.3 CNBC - Adobe's AI Assistant for Acrobat



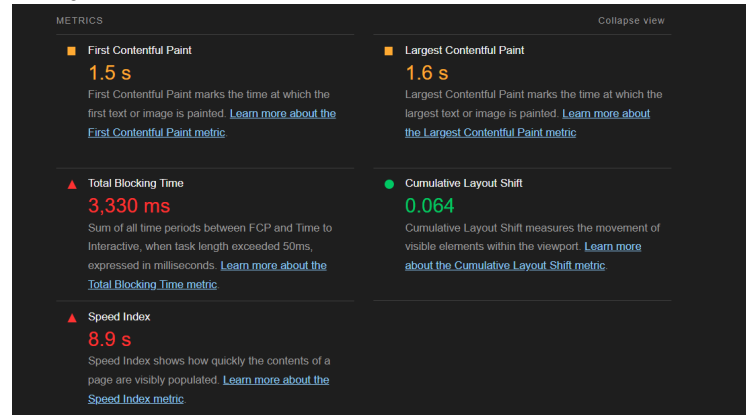
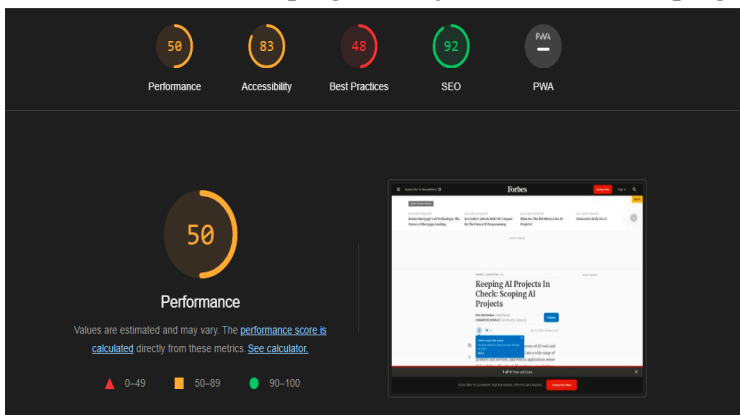
## 2.4 Business Insider - Tech Stocks Outlook on AI Investing



## 2.5 Entrepreneur - Wearable AI Pin as a Smartphone Alternative



## 2.6 Forbes - Keeping AI Projects in Check: Scoping AI Projects



## 3.0 Analysis Of Performance Report

### 3.1 Strengths

Fortune - Europe's Generative AI Race and Funding has a proper semantic HTML usage whereby there's proper structure and meaning of the content. Text readability is assured where there are no long

blocks of texts without any proper formatting. SEO strategies in this website encompass most approaches, including On-Page SEO, focusing on optimizing individual pages for better rankings through meta tags, content, and internal linking and providing a structured page. Bloomberg - Electric Utilities' Response to AI Data Center Demand consists of proper accessibility. The accessibility portion boosts proper attributes that meet their roles and contain an adequate page structure. SEO includes a meta name tag with width or initial scale with its title element and a meta description. It returns a successful HTTP status code and uses descriptive text for links, ensuring they are crawlable and not blocked from indexing.

CNBC - Adobe's AI Assistant for Acrobat utilizes HTTPS for secure connections and permits users to paste into input fields. It also refrains from requesting geolocation and notification permissions upon page load. Images are displayed with correct aspect ratios and served with appropriate resolutions. The page adheres to the HTML doctype and adequately defines the charset. It also contains valid source maps for debugging purposes but has one warning for using deprecated APIs and third-party cookies.

Business Insider - Tech Stocks Outlook on AI Investing provides a near-perfect accessibility and SEO, further enhancing user experience, improving search engine rankings allowing broadening audience reach. Essentially, they make the website more user-friendly, inclusive, discoverable, and trustworthy.

Entrepreneur - Wearable AI Pin as a Smartphone Alternative ensures a perfect score of accessibility and SEO with best practices followed ensuring a good user viewing experience as a whole.

Forbes - Keeping AI Projects in Check: Scoping AI Projects has good SEO utilized in this web page. Accessibility is provided sufficiently but with the exception of buttons and webpage having an accessible name.

### **3.2 Weakness**

Fortune - Europe's Generative AI Race and Funding has a bad practice of having a website, as in, the website exhibits several issues that can impact its security, performance, and user experience. Firstly, not using HTTPS exposes users to potential security risks, such as data interception and manipulation. Additionally, requesting notification permission on page load can disrupt the user's browsing experience and lead to annoyance or distrust. The effectiveness of the Content Security Policy (CSP) against XSS attacks needs verification to ensure the website's protection against vulnerabilities. Deprecated APIs risk future compatibility issues and may hinder the website's functionality. The extensive use of third-party cookies raises concerns about user privacy and data tracking. Registering an unload listener and logging browser errors can affect the website's performance and user perception. Lastly, detecting JavaScript libraries prompts the need to review and optimise them for better performance and security.

Bloomberg - Electric Utilities' Response to AI Data Center Demand The website uses deprecated APIs, has five third-party cookies, registers an unload listener, logs browser errors, and has problems logged in Chrome DevTools. Additionally, it detects JavaScript libraries. These concerns affect performance, user privacy, and site reliability, highlighting the need for resolution to ensure a better website experience.

Just like Bloomberg's website , CNBC - Adobe's AI Assistant for Acrobat has several issues; it uses deprecated APIs, has five third-party cookies, has an unload listener registered , lots of logs of browser errors, and has problems logged in Chrome DevTools. It also detects JavaScript libraries increasing the size of web pages, leading to slower loading times and poorer performance.

Business Insider - Tech Stocks Outlook on AI Investing has a terrible response time when it comes to accessing the website. It also has an unpleasant score of best practices because the discovery of 36 third-party cookies on the website is concerning, as it indicates extensive tracking of user behavior across different domains. These cookies raise privacy issues and may lead to user distrust. Additionally, browser errors logged to the console suggest underlying issues with code execution or resource loading, potentially affecting website functionality and user experience. Furthermore, matters logged in Chrome DevTools highlight broader technical challenges that need attention. Resolving these issues promptly is crucial to uphold user trust, ensure compliance with privacy regulations, and maintain a seamless browsing experience.

Forbes - Keeping AI Projects in Check: Scoping AI Projects utilizes outdated APIs, leading to two warnings that could result in compatibility issues and hinder functionality over time. Secondly, third-party cookies raise significant privacy worries, allowing extensive user activity tracking across domains and potentially jeopardizing user privacy. Additionally, registering an unloaded listener hints at potential performance problems impacting the browsing experience. Browser errors logged to the console indicate underlying issues with code execution or resource loading, affecting website functionality and user experience and necessitating prompt attention. Logged issues in Chrome DevTools signify broader technical challenges requiring resolution to maintain website performance and user satisfaction. The detection of JavaScript libraries underscores the importance of careful management and optimization to enhance website performance and security. Additionally, seeking notification permission upon page load may disrupt user browsing, potentially causing annoyance or distrust.

#### **4.0 Comparison And Contrast Evaluation Results**

From the performance report shown for each website, we can conclude that overall Entrepreneur - Wearable AI Pin as a Smartphone Alternative website has the highest performance with a score of 88

whereas Fortune - Europe's Generative AI Race and Funding website has the lowest performance with a score of 33. Compared to other websites, Entrepreneur - Wearable AI Pin as a Smartphone Alternative has the lowest total blocking time and speed index. This means that the website records the lowest total time taken during page load where the main thread is unable to respond to user input and displays the content of the website quickest. The same website also has 0 cumulative layout shifts which means there were no unexpected layout shifts during the page load process. However in terms of first contentful paint and last contentful paint, Business Insider - Tech Stocks Outlook on AI Investing website has the lowest score. This indicates that the website records the lowest time to display the first piece of content and to display the largest piece of content on screen.

## **5.0 Recommendations For Optimization And Improvement**

One of the best and arguably the most important step that can be taken to improve the performance of these websites is to remove unused JavaScript to reduce bytes consumed by network activity. When a website loads, it has to download and parse all the necessary JavaScript files related to the page. Unused JavaScript will only add more weight to these files which will end up increasing the time taken for the website to load. Next, the websites can also be improved by reducing the impact of third-party codes. Third-party codes refer to scripts embedded to the site directly from a third party vendor such as advertisements and social sharing buttons (Facebook, Instagram, etc). Too much third-party code will end up blocking the DOM (Document Object Model) which will cause delays during page rendering. Furthermore, each third party script will require additional HTML requests to the external server. This will increase the amount of network requests and slow down the loading time of the page.

Another great way to optimize the performance of these websites is to reduce the main-thread work. The main thread of the renderer process handles most of the code and executes the JavaScript. If the main thread is overloaded with unnecessary work, it will slow down the loading time of the page and it will lead to a sluggish and unresponsive user interface. Reducing main-thread work also optimizes resource utilization. By reducing the consumption of resources such as CPU time and memory, critical tasks can be prioritized and executed efficiently. Last but not least, avoiding excessive DOM size is a great way to increase the performance of these websites. The browser needs to render and parse the entire DOM tree to display the website. The larger the DOM size, the longer the time it takes for the browser to complete this process. One of the ways to avoid excessive DOM size is to limit dynamic content on the website. Dynamically generated content will increase DOM size significantly especially when used repeatedly. Instead, dynamic content should only be used efficiently and whenever necessary to have an optimal DOM size which ensures the performance of the website is not compromised.

## 6.0 References

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