Enhancing website efficiency

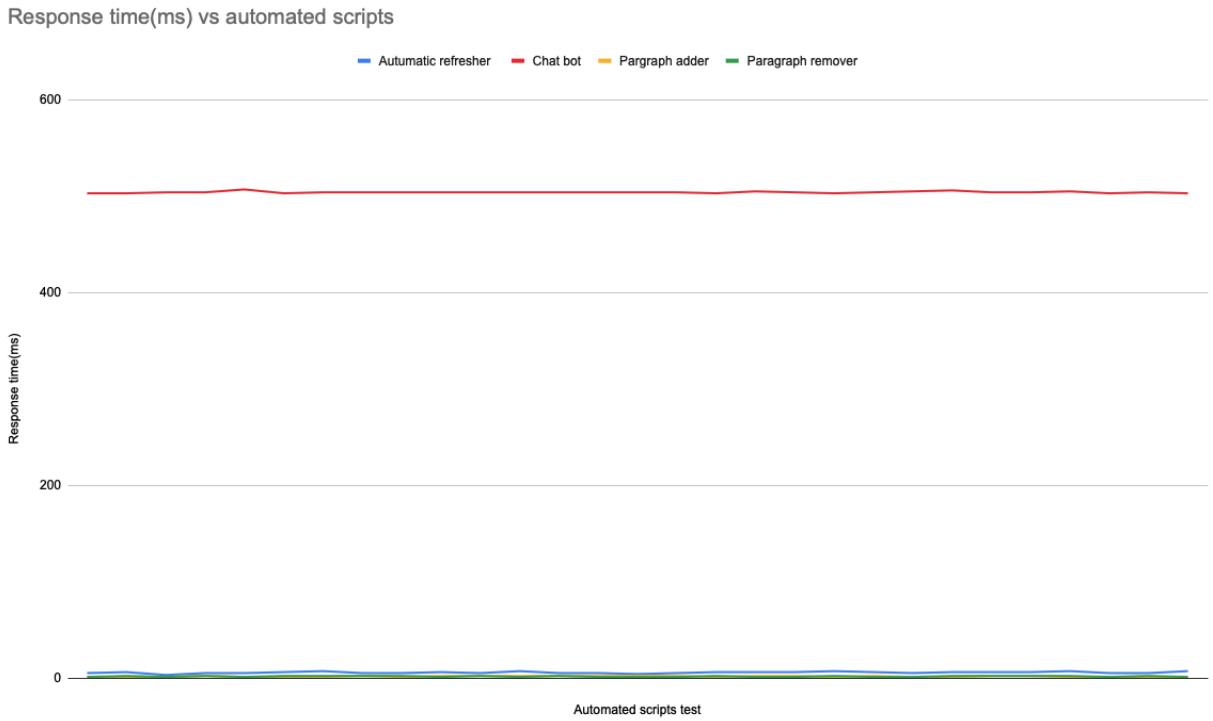
Automated scripts are “instructions written in programming languages to perform pre-defined tasks without human intervention”(BrowserStack, 1) Automated scripts are very useful when it comes to coding a webpage. “Using automatic testing methods for software testing helps reduce mistakes, time and number of manual testing by software testers.” (Sangwatthanarat, 1) Thus adding automated scripts to your website allows for you to spend less time in the future adding or fixing stuff on your website as well as the information is already there on the webpage rather than you adding it so it doesn't affect the website's servers at all. When creating a website there are many automated scripts that you can use to make your website more efficient, but many of these automated scripts impact one another so this project is seeking to determine which automated script is the most efficient for your webpage so that people can determine which automated scripts they should add to their websites. This project seeks tests four of the most common scripts that can be found on a website (Automatic page refresher, Automatic text adder, Automatic text deleter, and Chat Bot) and are being looked at to determine how automated scripts affect websites efficiency as well as which automated script is best for your website. The scripts are being tested on the time it takes for them to complete their action. The hypothesis for this experiment is that the automatic page refresher will have the best optimal response time out of the 4 automated scripts and “The optimal server response time is under 200ms. "(Mozo, 1) So even though one of these scripts might do better than others if the script isn't below 200 ms response time it still would not be a script you should add to your webpage due to the slow response time.

To test this experiment the test will need an html editor on a computer, there are many you can choose from but this experiment was conducted using the mac HTML editor that can be found in the Apple app store but to repeat this experiment it is not necessary as long as you have an HTML editor it will work perfectly fine. After you have downloaded the HTML editor on your computer the first step is to make a basic or advanced webpage. This webpage must first include a nav bar as well as at least a few text boxes, these text boxes can include information about you or your project but there is not any needed information in the nav nor the text boxes that will affect the experiment. The next step after you have created your basic or advanced webpage is to duplicate the page 4 times. This is needed so that you can separately test each of the 4 automated scripts separately on their own webpage so that the code does not mess with one another due to some of the automated scripts affecting others. After you have duplicated the webpage 4 times for each of the automated scripts you can now add the automated scripts, if this is your first time making automated scripts I would suggest starting with the automated page refresher due to it being the easiest automated script to code and code the chat bot last due to it being the most advanced automated script when coding these scripts make sure to keep all the code in one file as using multiple files could cause large amounts of load time and this could throw off the whole experiment. Make sure when adding the scripts to the web page add a clock at the bottom of the webpage in order to be able to tell how long the webpage takes to respond to these automated scripts. After each script test to make sure it works, if it works collect up to 30 data points on the script itself then move on to the next script until finished, the fastest way to get the data needed is to refresh the page after you get each data point due to it resetting the code which will allow the timer to start back up again.

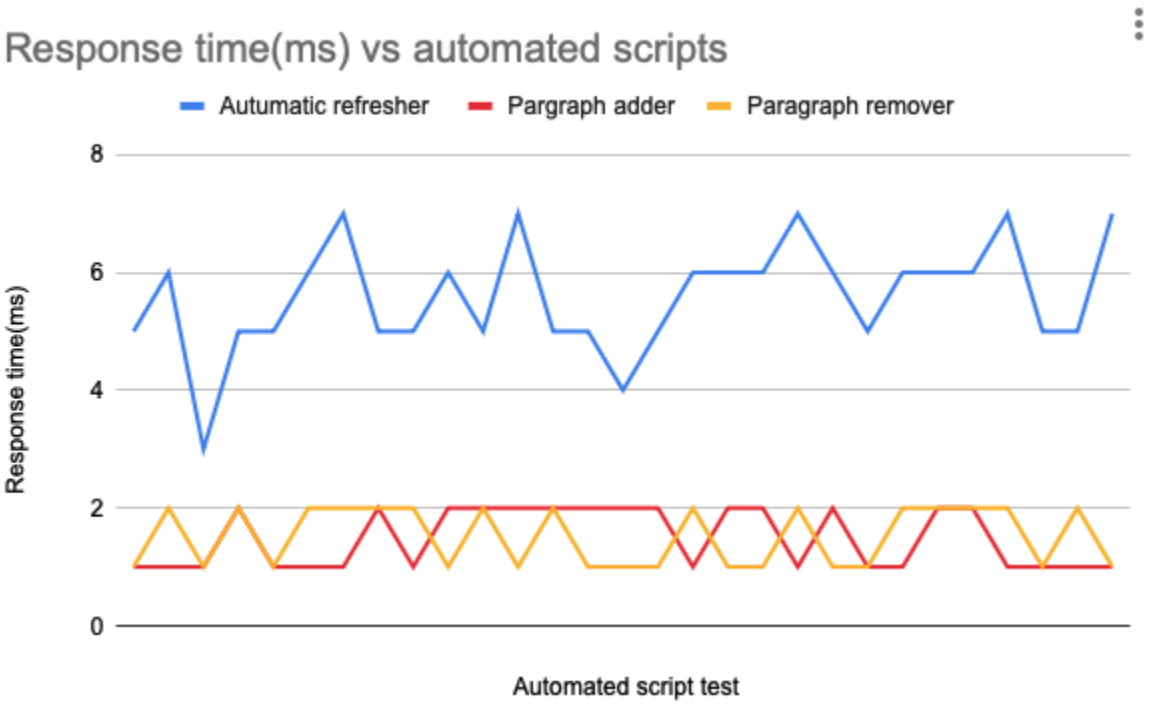
Data for this experiment has been recorded in several different ways to show there overall time to complete the event as well as to compare each of the automated scripts to one another. In the first part of the experiment each script was tested 30 separate times in order to come to averages for each of the scripts on the time it takes to complete the event; this can be seen in the table below.

	Automatic page fresher response time in (Milliseconds)	Chat bot reaction time in (Milliseconds)	Automatic paragraph adder reaction time in (Milliseconds)	Automatic paragraph deleter reaction time in (Milliseconds)
Mean	5.586206897	504.0344828	1.482758621	1.517241379
Median	6	504	1	2
Standard deviation	0.9455626209	0.9056473068	0.5085476277	0.5085476277

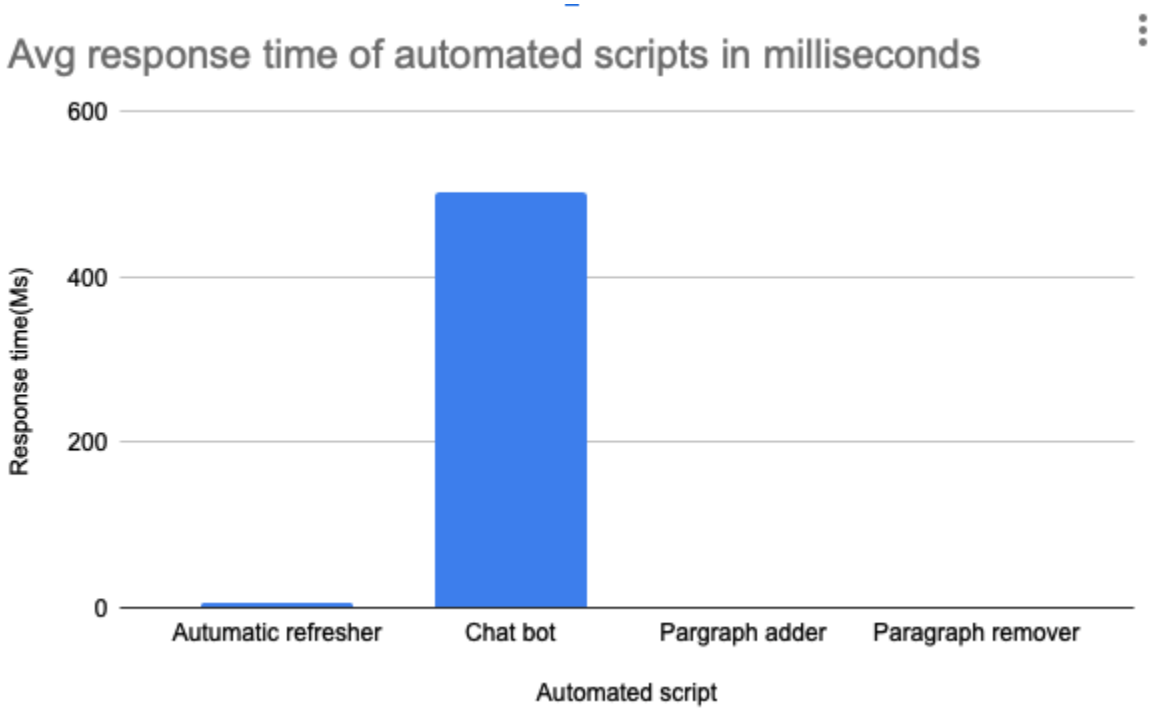
Each of the 30 times for the automated scripts were put onto a data table in order to compare each of the scripts to one another and to see any major changes during the process for any of the automated scripts



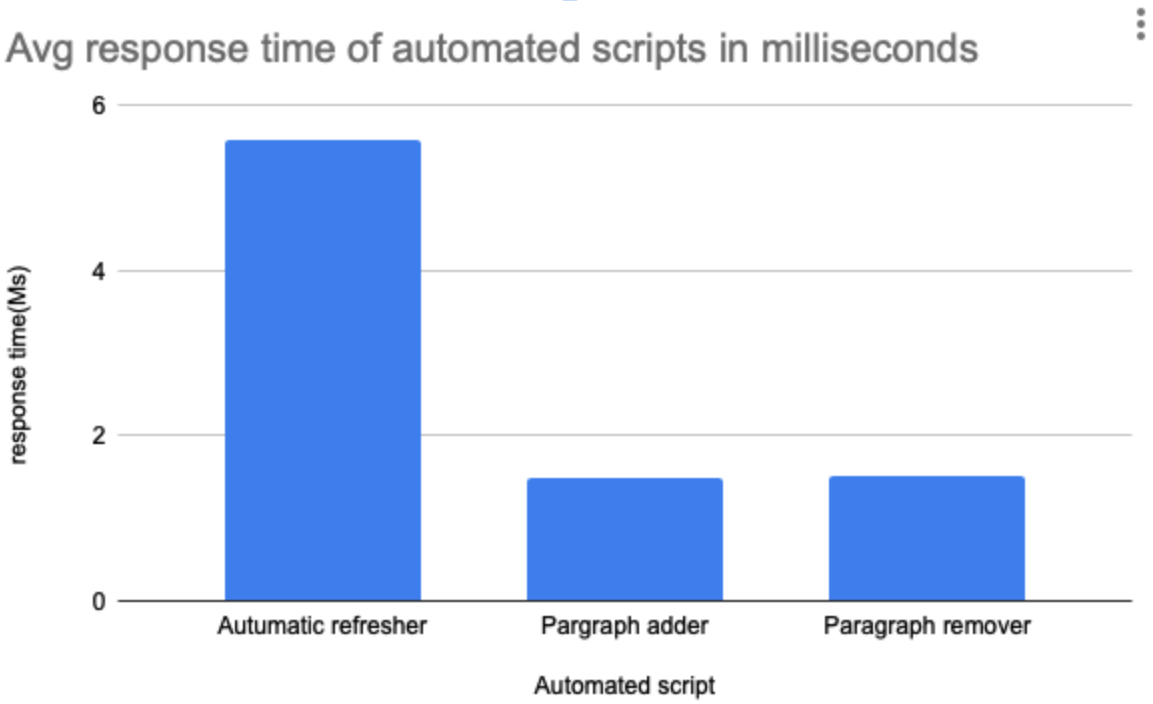
Due to the chat bot overwhelmingly having a much slower response time then any of the other automated scripts the graph for each of the 30 points for the 3 other automated scripts will be shown allowing for easier comparison between those 3 scripts.



As well as the 30 individual points being graphed in this experiment the avgs for each response time was also graphed in this experiment due to the fact that some of the scripts' response time were similar and hard to see any differences



Once again the graph for the averaged scripts makes it hard to see due to a large distance in the data so there was another graph made in order to allow for easier viewing of similar scripts in order to allow the experimenter to better determine which script is the most efficient.



These data tables help show the response time for each of the scripts and while we can see differences themselves it cant be determined if there are any significant differences without comparing each of the following scripts. The comparison between each of the follow scripts was done through a t test and can be seen in the table below

Data set 1	Data set 2	T test value	Significant?
Refresher	Chat bot	2050.1	Yes
Refresher	Auto adder	20.582	Yes
Refresher	Auto Delter	20.4	Yes
Chat bot	Auto Adder	2605.5	Yes
Chat bot	Auto deleter	2605.4	Yes
Auto adder	Auto deleter	0.25	No

This experiment sought to determine which of these 4 scripts affect your website as well as the most optimal script for your website in order for you to know which script you should add to the website. For how the scripts affect the website as a whole the scripts enhanced the websites efficiency overall making for a fast quick update allowing for less work on the person editing the website as well as not affecting the viewers at all. The hypothesis for which automated script is most efficient in this experiment was that the automatic refresher was the most optimal due to the fact that all it had to do was refresh the whole page instead of refreshing and adding something or responding to a question. Well the hypothesis was proven false as the automatic adder has the fastest optimal time due to the response speed of 1.48 milliseconds followed closely by the automatic deleter at 1.51 milliseconds on avg This is probably due to the fact that they are very similar scripts while one deletes the text the other one adds and if the experiment was tested more time the averages probably would have been closer and that is also why the only non significant difference between any of the automated scripts was between the automatic adder and the deleter. The automatic deleters and adder compared to each each had a t test value of 0.25 meaning they were not significant from one another while every other script when compared to each other had at least a t test value of 20 . Thus there is not a most outright optimal script for your webpage but the automatic deleter and adder are the most optimal and significantly different from the other 2 automated scripts. While this may seem like a major problem all but one script did pass the optimal speed of an average of 200 ms response time or below. This means that you can add any of the page fresher, automatic adder, or deleter to your webpage without any problems. As well as the automatic adder and deleter can be added together due to the code not affecting one another but you can not add any of the other scripts with one another due to the code affecting one another and making one or both of the scripts useless. So in

conclusion the automatic page adder is the most optimal script but it is not significantly different from the deleter.

Appendix:

Here is all the raw data for each of the automated scripts all 30 times they were tested. This was just too long to add the paper without affecting the flow of the paper.

Trial	Automatic refresher reaction time in (ms)	Chat bot reaction time in (ms)	Paragraph adder reaction time in (ms)	Paragraph remover reaction time in (ms)
1	5	503	1	1
2	6	503	1	2
3	3	504	1	1
4	5	504	2	2
5	5	507	1	1
6	6	503	1	2
7	7	504	1	2
8	5	504	2	2
9	5	504	1	2
10	6	504	2	1
11	5	504	2	2
12	7	504	2	1
13	5	504	2	2
14	5	504	2	1
15	4	504	2	1
16	5	504	2	1
17	6	503	1	2
18	6	505	2	1

19	6	504	2	1
20	7	503	1	2
21	6	504	2	1
22	5	505	1	1
23	6	506	1	2
24	6	504	2	2
25	6	504	2	2
26	7	505	1	2
27	5	503	1	1
28	5	504	1	2
29	7	503	1	1

Work cited

Gh. “A Detailed Guide on Automation Scripts | BrowserStack.” *BrowserStack*, 16 Sept. 2024, www.browserstack.com/guide/automation-script#:~:text=Automation%20scripts%20are%20instructions%20written,defined%20tasks%20without%20human%20intervention.

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Sangwatthanarat, Kantinan, and Taratip Suwannasart. *Generating Test Scripts for a Single Page Web Application Based on Database Schema*.