Edinburgh Napier UNIVERSITY

Coursework Report

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1 Introduction

The aim of the coursework is to design and implement a website made up of a set of pages, which is capable of encrypting messages with classical "ciphers". The website must be implemented only by HTML, CSS and JavaScript.

My website has three main tabs "Home", "About Ciphers" and "Encrypt/Decrypt Message". You can navigate through these tabs using the navigation bar right below the header of the website. The "Encrypt/Decrypt Message" tab is the essential part of the site where all the magic happens. The website is consisted of five HTML documents, one CSS document and five JavaScript documents.

The early steps I took to approach this assignment were the background reading, planning of the website, deciding which ciphers I would use on my website and make some sketches displaying how my website would look like. Firstly, did some background reading on "Caesar" ciphers, Rot13 to get the idea of how the ciphers are working and I decided to implement these two ciphers for beginning. Then I began looking for some design patterns on "www.W3Schools.com" online tutorial website, along with studying in the practicals every week.

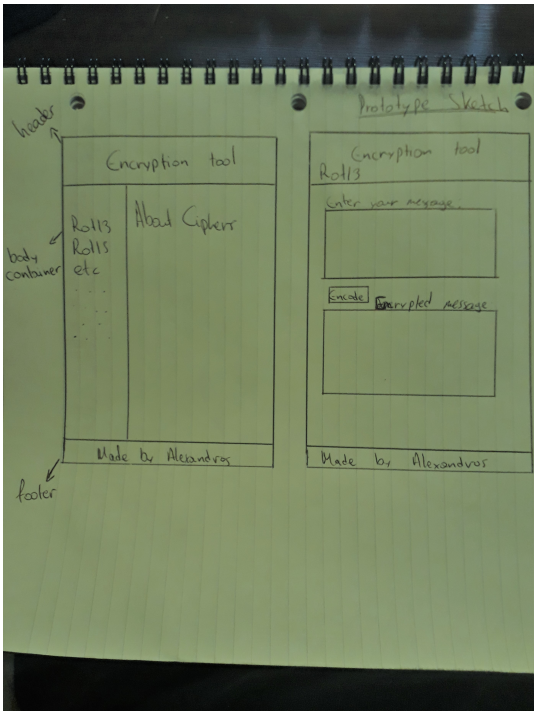

Figure 1: Layout Sketch

2 Software Design

There are numerous steps in the web site design and development process. From gathering initial information, to the creation of your web site and eventually to test and to deliver it. After I gathered enough information about enciphering messages I started focusing on the requirements of the website. Then I created a list with the requirements of the website after reading the assignment specification.

1. Minimum 3 pages
    - Home
    - About Ciphers
    - Encrypt/Decrypt messages
2. At least one style-sheet
3. At least 2 different ciphers
    - ROT13
    - Caesar cipher

The following step was to make some sketches for the layout of my website. I found this really helpful for the reason that I was trying to keep in my mind a specific layout and not just randomly selecting stuff. Although, it was an early sketch and many changes occurred midway to make my website more user-friendly and to improve the layout. You can see the early sketch of my website layout on Figure 1.

After that I drew a navigation diagram on "www.draw.io" website to keep track of how my pages should be connected and how the user can navigate through the site. Again, this was very helpful for the implementing part because it was easy to check if every page was connected with each other. The initial diagram was a bit different because I had in mind to make another page for deciphering messages but I ended up deciphering messages on the same page where the encryption was made. You can see the final navigation diagram of my website on Figure 2.

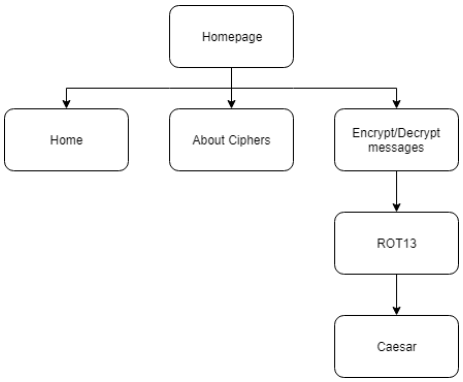

Figure 2: Navigation Diagram

3 Implementation

The website is made up from eleven documents, five of them are HTML documents which are implementing the layout of each page, containing the text, images and hyperlinks. There is one CSS document, that demonstrates all the typographical and representational elements used in my site for all five HTML documents. The rest are JavaScript files which are responsible for the functions of the site like buttons "on-Click" functions to encode, decode, clear text etc. Some models of my implemented documents can be seen below on Figures 3, 4, 5.

Figure 3: HTML Document

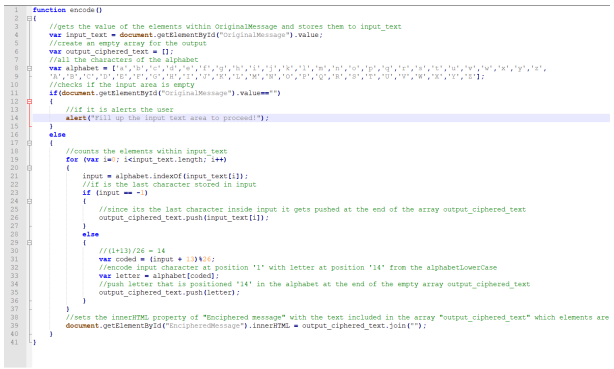

Figure 4: JavaScript Document

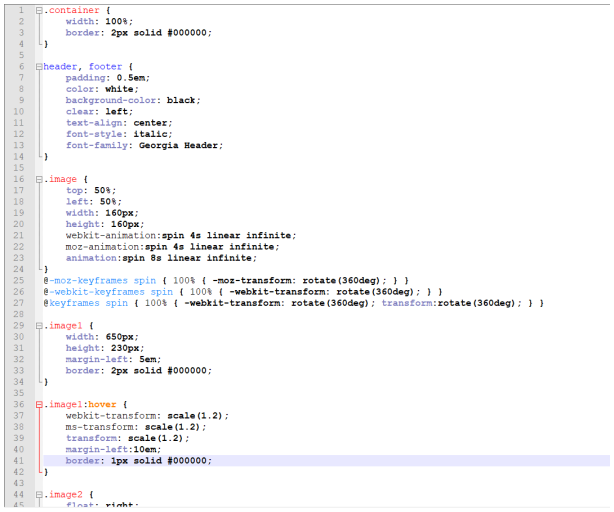

Figure 5: CSS Document

I started implementing my website by creating the layout of my index page first. I realized that the layout was the most important part on the creation of this website, for the reason that it was the core for every page I was going to create. I spend lots of hours designing the layout because I knew that once I was done with it I could use it on every page of my site. The final layout is simple made up from the head of the page, a division separated into the header and footer, a navigation bar, an aside for the contents all contained in the body. Of course, I was making on going changes, although you can see the very early design of my website below on Figure 6,7 and the last finalized design of the website on Figure 8,9.

Figure 6: First Design Index Page

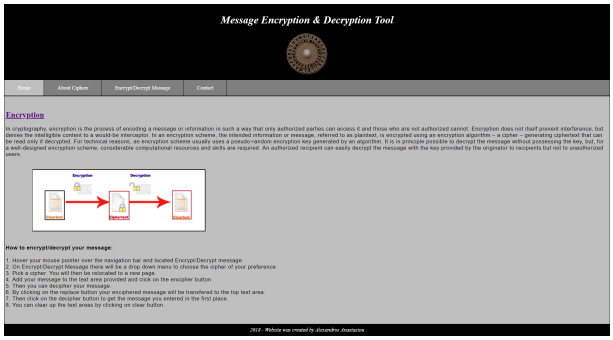

Figure 7: Final Design Index Page

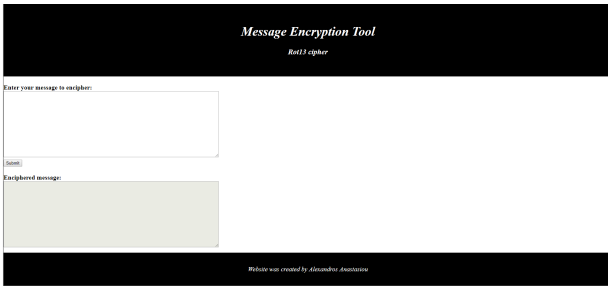

Figure 8: First Design Encrypt/Decrypt Message Page

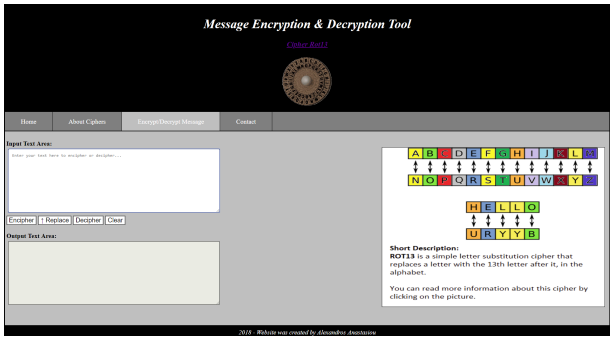

Figure 9: Final Design Encrypt/Decrypt Message Page

Overall, the HTML files are quite the same, the only difference they have are in the context depending on the functionality of the page. JavaScript files on the other hand, are unique because they are handling different functions. The five JavaScript files are responsible for encode, decode, clear text and replace text functions that are contained in the "Encrypt/Decrypt message" tab. On the Figures 10,11,12 below you can see the code contained in the JavaScript files.

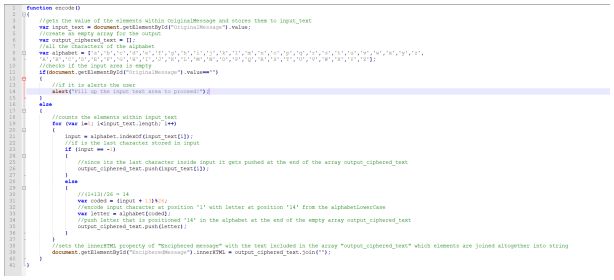

Figure 10: Encode JavaScript File

```
function clearText() {
    document.getElementById("OriginalMessage").value = "";
    document.getElementById("EncipheredMessage").innerHTML = "";
}
```

Figure 11: Clear Text JavaScript File

```
function replacetext() {
    if (document.getElementById("EncipheredMessage").innerHTML=="")
    {
        alert("No text in the output text area. Encipher or decipher your message first!")
    }
    else
    {
        var input_text = document.getElementById("EncipheredMessage").value;
        document.getElementById("OriginalMessage").value = input_text;
        document.getElementById("EncipheredMessage").innerHTML = "";
    }
}
```

Figure 12: Replace Text JavaScript File

4 Critical Evaluation

In brief, I can say that I managed to carry out all the tasks of the assignment. I implemented many advanced features that we didn't cover in the lectures or practicals and discovered them on my own by further reading and practising on my own time. My Index page is well organized and has all the necessary information to help the user navigate through the website easily. It has two cipher pages that can encrypt and decipher messages and they are fully functional. The design of my website is simple yet efficient and not overwhelmed with animations to make it smooth and deliver great user experience.

Obviously, if I was to release the website there are a couple of improvements that should be made because I was out of time. The use of a Flex-box would be necessary, so it will ensure that elements behave predictably when the page layout must be accommodated by different screen sizes and displays, so the layout will not be affected.

I should definitely add more ciphers to give the user multiple ways of encrypting messages, for the reason that the ciphers I implemented can be easily broken, and in fact are considered insecure. Another great idea is to use passwords for encrypting and deciphering messages to make them even more secure.

I wanted to keep a low profile and I didn't make my website too colorful and the text is quite simple, this was my preference but some improvements can be made.

I added a contact page but it's not functional because we were not allowed to use any additional libraries and api's, for the same reason I skipped creating a donate page as well for the reason that it would be useless and not functional as well. If I release the page in the future I would definitely make these improvements.

5 Personal Evaluation

I am really passionate for Web Technologies and I envision myself building my career based on it. I was looking forward for this module since the day I joined the course. I enjoyed spending many hours doing background reading and practising on online tutorials and learning as much as possible for website building and designing.

There is an infinite list of CSS features that can change your website design. I learned how to make navigation bars, which took me lots of hours to make it just the way i imagined it. Another great feature that i came across was the drop down menus which it seem difficult in the beginning but not anymore. Again lots of hours of editing and studying helped get through this part as well.

The most challenging part of the assignment was obviously the JavaScript files. After, a couple of unsuccessful tries to create the JavaScript file for the Rot13 on my own, i used the one that it was given on the practical example which i had to search every single line on my own online to fully understand the function of it since there were no comments or explanation for it.

I had some trouble understanding that the text i was getting the input text-area was its actual "value" and when I had to return it in the output text-area i was actually returning "innerHTML" form. I overcame this challenge by asking for help from the student assistants in the lab for programming surgeries, who helped me understand the difference between these two.

From the early steps when i was studying for the ciphers I have seen the cipher disk and I wanted to make it rotating in my website. Of course, I had no idea how to get it done. Again, thanks to the internet forums i managed to find lots of solutions and accomplish this task.

After this assignment I have to admit that I learned lots of new features that i didn't even know that you could edit and i expanded my knowledge on website building and designing. Through the challenges i have been through and overcame I was gained advanced skills on HTML, CSS and JavaScript.

6 References

References

Stackoverflow.com. (2018). Stack Overflow - Where Developers Learn, Share, Build Careers. [online] Available at: https://stackoverflow.com [Accessed 4 Mar. 2018].

Animation, C. (2018). CSS3 Rotate Animation. [online] Stackoverflow.com. Available at: https://stackoverflow.com/questions/16771225/css3-rotate-animation [Accessed 4 Mar. 2018].

En.kryptotel.net. (2018). Kryptotel - What is encryption and how to encrypt communication. [online] Available at: http://en.kryptotel.net/encryption.html [Accessed 4 Mar. 2018].

En.wikipedia.org. (2018). Caesar cipher. [online] Available at: https://en.wikipedia.org/wiki/Caesar-cipher [Accessed 4 Mar. 2018].

En.wikipedia.org. (2018). Cipher. [online] Available at: https://en.wikipedia.org/wiki/Cipher [Accessed 4 Mar. 2018].

En.wikipedia.org. (2018). Encryption. [online] Available at: https://en.wikipedia.org/wiki/Encryption [Accessed 4 Mar. 2018].

En.wikipedia.org. (2018). ROT13. [online] Available at: https://en.wikipedia.org/wiki/ROT13 [Accessed 4 Mar. 2018].

Secretcodebreaker.com. (2018). Caesar Cipher History. [online] Available at: http://www.secretcodebreaker.com/history2.html [Accessed 4 Mar. 2018].

W3schools.com. (2018). W3Schools Online Web Tutorials. [online] Available at: https://www.w3schools.com [Accessed 4 Mar. 2018].