Edinburgh Napier UNIVERSITY

Coursework Report

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1 Introduction

The purpose of this assignment was to create a fully functional website that within it had various different web pages that the user can interact with by encrypting and decrypting any message they present it with. The choice of ciphers we were to implement was optional so I opted to go for;

1. Caesar
2. AtBash
3. Binary

My site has been implemented so that the home page is able to navigate to each individual cipher web page whilst maintaining the continuity of the layout and colour theme. Minimal research was required as I had a basic understanding of what each cipher should achieve and a clear picture of how I would be able to put this to practice. However the background reading which aided me in completing this project has all been referenced in the last page of this report. Most of these resources were recommended to us during lectures and practicals so I decided to make good use of that.

2 Software Design

The first step was to plan the presentational element of the website and the key features I wanted to be included. The simplest way to do this was to start drawing some sketches and evaluating what looked best where for the main page of the website. The goal was to make sure it incorporated a navigational bar which linked to each cipher page, below is the first sketch.

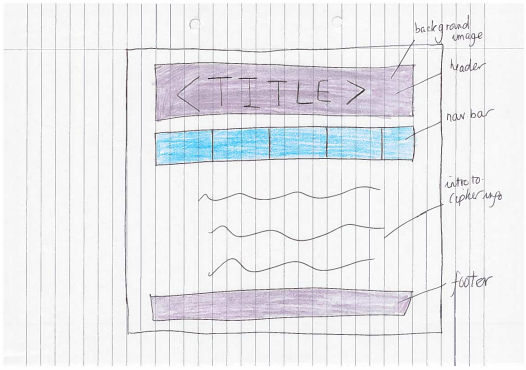

Figure 1: Sketch of Homepage

After the homepage was decided it then fell to the layout of the cipher pages. The same basic principle was there that each cipher page would have the title and navigation bar fixed so it was easy for the user to travel between the ciphers and homepages as well as being pleasing on the eye.

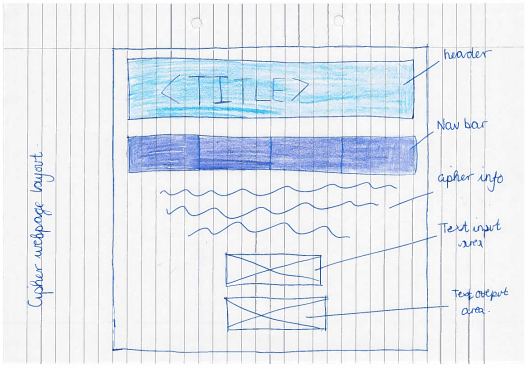

Figure 2: Sketch of typical cipher page

In addition to the layout of the homepage the cipher page needed to have an input and output area for the user to encode and decode their given message. The text areas needed to be an appropriate size to ensure it was easy for the user to find and use and accommodate anyone who struggles to see small text. A brief background history of the cipher and a quick introduction on how to use it would also need to be included.

The navigation bar was one of the main focuses in my design, it needed to stand out to the user and be clear which option they were picking.In order to do this I researched some websites to see how they accomplished this. One in particular caught my eye, not for its aesthetically pleasing look but due to its simplicity, [4], when you choose an item a list it highlights it in a different shade when hovered over, this is something that will require research when implementing the website.

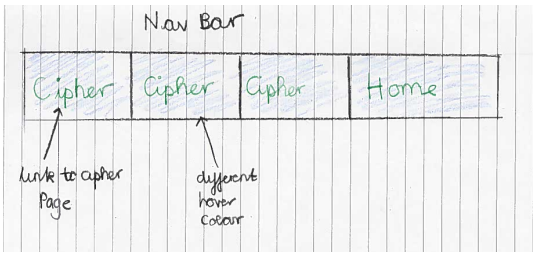

Figure 3: Sketch of navigation bar

After the presentation design next to consider was how each cipher would be designed in JavaScript. Initial thoughts were to use Unicode characters, however the more I broke the problem down it seemed apparent the easiest way to achieve the goal was to use arrays.

In order to make the presentational side of the website it was clear it would be a combination of HTML and CSS and for

each individual cipher JavaScript would be needed to encrypt and decrypt the users message.

3 Implementation

Fast forward to the current website and its clear to see that the sketches are what has been implemented using HTML and CSS. The sketches provided an outline of what I would need to build upon if I wanted to create what I set out to do. Each individual cipher has its own HTML and JavaScript file but they all link to one CSS file which contains the design elements. By doing it this way, it ensured each cipher had the recurring background image [5], title and navigation bar all in keeping with the idea of continuity.

To implement the navigation bar various options were tried and tested but in the end the best way to get it functioning to full capacity was to create 4 buttons each with a link to a cipher page and increase its width to 25% so it filled the page. The main source of reference for designing my website in HTML and CSS is [6-9].

In regards to the CSS sides of things, many features were added that were not first intended. For example, due to the fact my background image is white with hints of black it was very difficult to find the best font colour to compliment it as well as em-compassing my recurring colour theme of blue and grey. Eventually it was evident the title would need to have a background colour to it alongside the image, the best way to make it look aesthetically pleasing and practical was to use a mark around the title in HTML and style it in CSS.

A footer was also created at the bottom of the home page, this was introduced as it would have felt a bit bare with just the information on it. As the navigation bar and footer run parallel to each other it adds some symmetry to the page and relates to the running colour theme.

During various stages of the development to ensure the positioning of the title, footer etc was all in the correct place, content needed to be added so the actual look of the site was authentic. However, this had not been created yet, so the process of "Greeking" was used. Lorem Ipsum was the chosen text, it had a fairly normal distribution of characters and was the size required to check the CSS padding was accurate.

The implementation all started with the home page, as soon as this was up and running the ciphers would just link to the already created CSS. From the home page it gives a brief description of ciphers and how they came to be, from there you can try your hand at any of the 3.

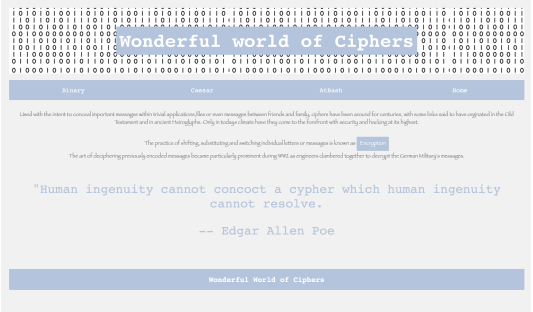

Figure 4: Homepage

The AtBash cipher, adjacent to the homepage in the navigation bar, was implemented using JavaScript, like all the ciphers within the website, and encrypts and decrypts the user's message.This cipher takes the user input and uses a reverse alphabet array to switch the letters around and display this new message back to the user. Due to the simplicity of the cipher, it didn't require a decode function, the decrypt button just recalls the encrypt function.

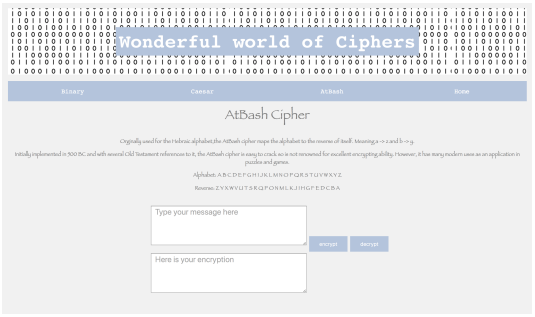

Figure 5: AtBash Cipher

The Caesar cipher uses a key to determine the shift change of the letters, the key is entered by the user. The way that was best to implement was to give the user the number input so they can select the number they wish and the script receives that input and shifts accordingly, this was implemented using arrays and not Unicode characters.

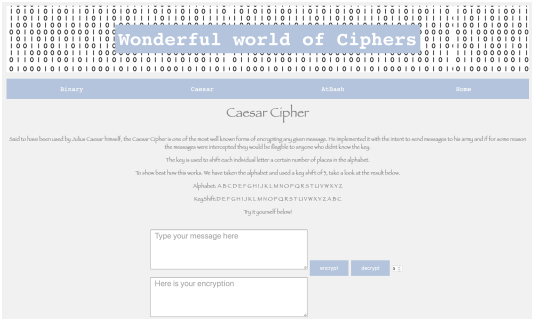

Figure 6: Caesar Cipher

The Binary Cipher works by taking the user's input and converting it into binary. Binary is represented by the digits 0 and 1. To my surprise, JavaScript has a built in function that is able to do this conversion in one statement, charCode, I was able to encode this fairly easily. However, the decode require more of a thought process than I had originally anticipated.

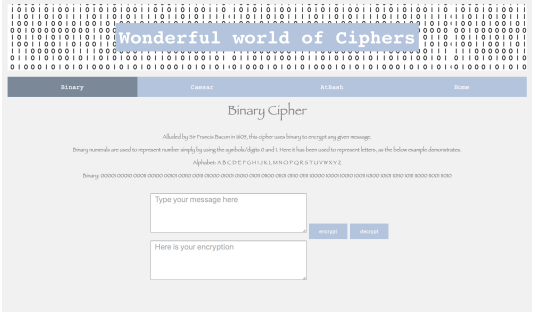

Figure 7: Binary Cipher

The above picture demonstrates the colour change when a button in the navigation bar has been hovered over, this works for all 4 items in the bar.

4 Critical Evaluation

In relation to the scope of this assignment, the website developed em-compasses them all. The set of classical ciphers have been implemented using JavaScript and provide a well rounded user experience.

In keeping with the brief, no additional libraries, frameworks or templates were used in the development of the website.

All pages are appropriately named and follow the correct format as provided in the specification. All 3 languages, HTML,CSS and JavaScript have been incorporated.

Each cipher HTML page is fully equipped with a definition of how it came to pass, an explanation on how it works and an area for them to encode and decode their chosen message.

The marking guideline also advises to gain a respectable mark it must provide an enjoyable and rewarding experience for the user. With the white, soft blue and greys recurring through each page it provides a bright and simplistic look. In order to achieve this, various links and resources given to us throughout the lectures were used to research design do's and don'ts.

Major design flaws in some websites can stem from their colour choice. All background reading resources that were looked into to avoid this have been cited within the introductory paragraph. [10]

However, although it includes all that was asked of it, there are a few details that would be altered/added if the site were to be developed again.

Firstly, the addition of some advanced ciphers. The ciphers developed on the website give the user an intermediate encounter with encoding and decoding ciphers. Due to certain time constraints it was important for the website to be

Secondly, the use of some more intricate features such as in-page sound effects. The idea of being able to have the encoded and decoded message enunciated out to the customer was very appealing. It would add a more inclusive feel to the website as people who struggle to see screens or text could get interactive audio feedback. Although, it was not successfully included on this site, it is most definitely something that will be looked into and put into practice by myself in the next coming weeks.

A personal critique that has been picked up on one of the web pages is the size of the step box in my Caesar Cipher. Although the text area sizes were able to be increased the input number box was not, meaning comparatively size wise the step box is significantly smaller. So if the site was to be developed again, this is a key feature that would be amended.

5 Personal Evaluation

Reflecting on what I have learned from this assignment I realized I have gained a great deal of new skills to add to my belt. As well as building on my previous knowledge of HTML I was able to successfully integrate it with both CSS and JavaScript in one site.

I feel I performed well within the project, however as previously stated in section 4, there are definite areas of improvement.

Despite this, I was able to complete the brief to a high standard and within the designated time scale and provide all the relevant information outlined in the specification.

6 References

Background reading:

Belongs to the book :

Practical Web Design for Absolute Beginners By Adrian W. West

[1]-https://link-springer-com.ezproxy.napier.ac.uk/content/pdf/10.1007

[2]-https://link-springer-com.ezproxy.napier.ac.uk/chapter/10.1007/978-1-4842-1993-5$_8$

[3]-https://link-springer-com.ezproxy.napier.ac.uk/chapter/10.1007/978-1-4842-1993-5$_6$

Referenced sites, that have been spoken about in previous sections.

[4]-https://www.google.com/drive/

[5]-http://supernatural.buzz/wp-content/uploads/2015/09/binary-code-pattern.png

[6]- https://www.w3schools.com/css/default.asp

[7]- https://www.w3schools.com/css/css$_n avbar.asp$

[8]- https://www.w3schools.com/css/css$_b ackground.asp$

[9]- https://www.w3schools.com/cssref/css$_c olors.asp$

[10]-http://www.color-hex.com/color-palettes/

Inspiration for the design.html page

[11]-http://oli.jp/2011/style-guide/