Edinburgh Napier UNIVERSITY

Coursework Report

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Edinburgh Napier University - Module Title (SET08101)

1 Introduction

The aim of this assignment is to design and implement a website consisting of a set of pages about classical ciphers which will showcase my knowledge of HTML, CSS & Javascript. This should not only be a functional website but a site that is simple and easy to use.
The ciphers I have chosen to use are the Caesar Cipher (with the ability to change the shift), Reverse Cipher (Which flips each letter of the alphabet) and Morse Code. I have programmed these with javascript using the rot13 cipher given in week 5's practical class as a base and adding features to completely change the function. I chose these ciphers as they are all substitutional which replaces letters with either other letters or symbols. Substitute ciphers were the first methods of encryption used so I felt they were fitting for a website about classic ciphers and that my site would make more sense if there were a common theme between the ciphers.

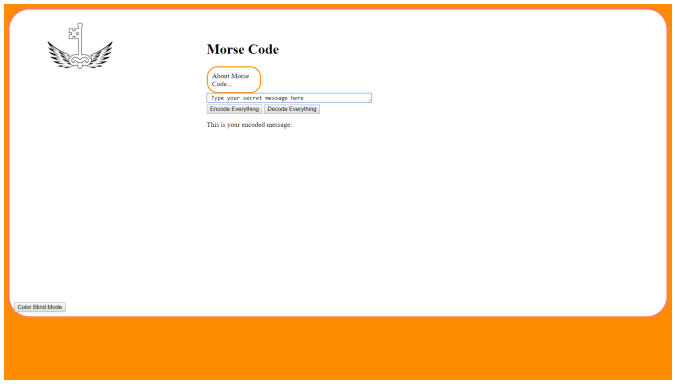

Figure 1: **Morse Code** - The Morse Code page of my site (without hovering)

2 Software Design

2.1 The HTML

The general look and feel of my site will be very simplistic with only a few items on screen at a time. This declutters the display and ensures that your reader's attention is focused on one item at a time. To do this I will make use of the display:hidden tag in css and a variety of divs each with an id relevant to them making the Css implementation more straight forward. All of the relevant information will be centered on the screen with a logo at the left corner. The logo should be a link to the index page. it is a widely used feature that is both aesthetically pleasing and easier to see than a small "Index" link. To make use of hidden menus and text I will first inspect websites that I use myself in order to see how they have implemented similar features. I will also make use of the W3 schools tutorials.

2.2 The Javascript

I have chosen to make a site dedicated to classical substitution ciphers which all make use of similar theories. With the Caesar Cipher I will modify the rot13 cipher from week 5's practical to allow you not only to encode and decode but to choose the number of rotations or shifts that you make.

The second cipher I have decided to implement is the reverse cipher which changes each letter to the opposite one in the alphabet. To achieve this I will add a second alphabet array which will be arranged from Z¿A. From here it will be a similar process to the Rot13 Cipher where each letter's position in the alphabet is found but instead of adding to that number it will simply replace the letter with the letter in the same position in the flipped array.

The third cipher that I will implement is Morse Code. This works in a similar way to the reverse cipher where the position of the letter is found and replaced with another value in the same position in another array however instead of letters this will be a series of dots and dashes (.-). This will make decoding the cipher far more difficult as I will need to separate the series of dots and dashes into their respective letters. To do this I will add a space after each completed letter and break the string taken by the user into an array splitting each string by a space (" "). This will allow me to find the position of the code sequence in the array and ultimately decode it.

2.3 The CSS

The color scheme I have chosen to go with is a dark orange border with a white background, black text and light blue accents inside the text boxes. This theme was chosen as I have used it with other university projects in the past, namely the ISO presentations, and have received very positive feedback on it's simplicity and overall pleasing aesthetics.
The border on my webpage should be dynamic so that if anyone is using a higher or lower resolution display than myself that it will still look the same. As well as that I would like my text to remain in the center of the page.
The only fixed portions of my page should be my logo, home button and drop down menu in the top left corner, as it is the most common place for websites to keep their navigation menus making my site accessible to first time users, And the Color blind button in the bottom left corner. My

site should already be suitable for color blindness however if anyone has any difficulties they can have the site switch to a monochrome color scheme for easier reading.

3 Implementation

The implementation of the site is extremely simplistic with only a few things on the screen at one time. To begin with I created a logo by combining two images sourced from Google's reuse label search. This logo can be found in the top left of each webpage besides the index where it is used instead of bullet points. Each cipher page has it's information hidden behind a drop down button. This is done so that the user has easier access to the encryption tool while they are not reading. This draws the user's attention to the correct information easier. The hidden cipher information is shown with a small border over the word about.

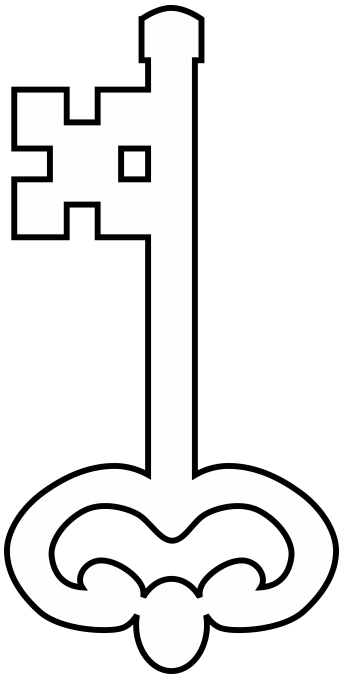

Figure 2: **Key Image** -The key picture used as a base for my logo)

Figure 3: **Wing Image** -The wings picture used as part of my logo)

4 Implementation Evaluation

4.1 Does It Meet The Spec?

The specification asks for two or more ciphers to discover of varying levels of complexity. I feel that my site exceeds this

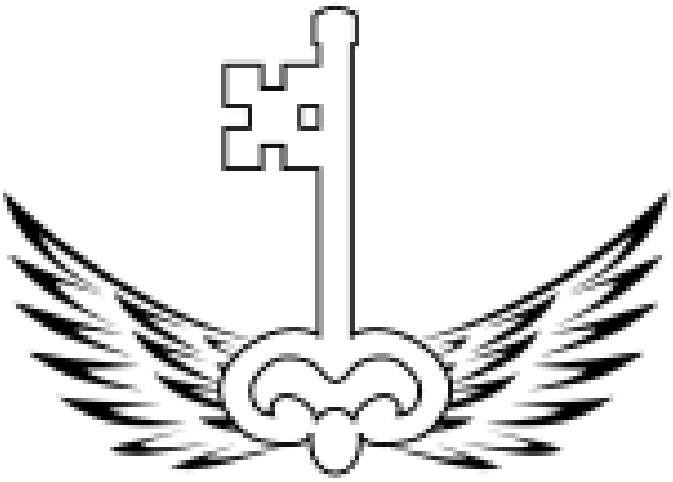

Figure 4: **My Logo** - The logo I made by combining two pre-made images

with three different ciphers for the user to enjoy. The Caesar cipher has the added complexity of being able to choose the shift while the Morse code has the complexity of decoding. These ciphers can all be decoded as well which meets the specification.

The feedback on the design on the site has been overwhelmingly positive. Each user has been able to navigate it easily without quarrels. I feel that this offers an excellent level of functionality with a rewarding user experience thus meeting the specification.

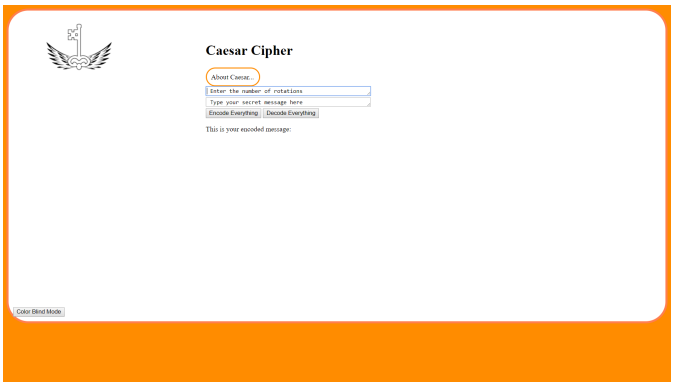

Figure 5: **Caesar Cipher Page** - The Caesar Cipher page of my site (without hovering)

The CSS and HTML used to achieve this high level of usability and functionality were discovered by inspecting websites that I deem aesthetically pleasing, finding the functions that are used to achieve this, for example the display:hidden and the hover tag, researching these until I was familiar with how they work and implementing them in my site. These advanced features and this level of research far exceeds what has been covered in the practical lessons and I feel exceeds the specification.

4.2 Possible Improvements?

If I were to publish this site I would add more codes and ciphers for the user to play with. I would also have liked to add in a test which would give the user an encoded message which would use multiple ciphers. This would make the user experience more engaging than the base site.

An improved index would be a good addition to the site but I do not see it as essential. It is currently very simple and I am getting praise for that but I would like it to have more pictures or colour. I did not implement this into my submitted site as I felt that without continuity between pages it would compromise the integrity of my website.

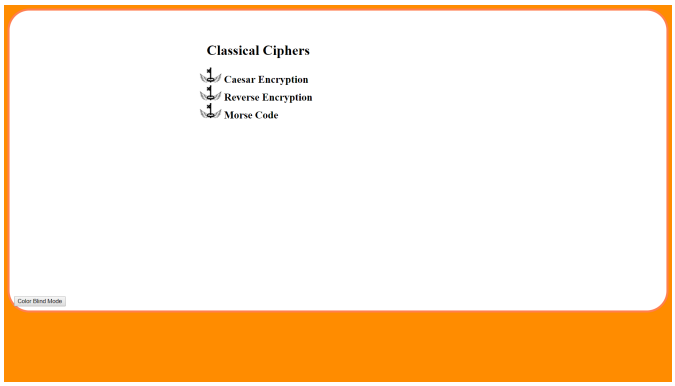

Figure 6: **The Index** - The Index page of my site (without hovering)

5 Personal Evaluation

Through this coursework alone I have gained a far greater understanding of style sheets and web layout through extensive research and product testing. Without a style sheet there would be no continuity between my web pages as seen in my previous lab exercises. This has shown me the importance of continuity between pages as if the colours or even the layout is different it is hard for the user to focus on the information on the screen.

The main challenges that I have faced through this coursework have been to do with design. Initially I struggled to select a colour for a background. On one hand I felt that a white background would be the easiest to read, the most minimal and aesthetically pleasing. This works well for sites like Apple's as there is a lot of content, each with different backgrounds and images whereas my site will have very little on the screen aiming to remove the clutter meaning that there should be another colour present. On the other hand, White is the default background for HTML pages which may make my site look lazy and not well thought out. Eventually I decided on the dark orange border with a white background as dark orange and white contrast in a pleasing and unobtrusive way. I know this as I have used this colour scheme in prior university assignments.

My second challenge was with dynamically shaping the background. to begin with everything was fixed meaning if you have a 1080p display you would find the website pleasing to use but if the site was windowed or used on a lower resolution display, the border will extend past the screen. This makes my site almost inaccessible to anyone with different specifications to myself. As I am unaware what computers my site will run on I had to make the border dynamically fill the screen. This caused me a multitude of problems as initially my border would fit in the screen but would shift my text too far to the right. In order to then center my text I had to put my background on a second div two above the body so that it would not affect the layout of the text.

Placing a drop-down menu under my logo was another challenge as it would not allow me to hover over the image id as I then wouldn't be able to select an option whereas if I were to set a div, the border that was surrounding the logo it would be an awkward shape and would still not fit the entire menu.
Eventually I set a div around the logo and drop-down menu, set an on hover which would make the drop down menu appear and removed the border which actually made the site look better.

The final challenge that I faced was the decoding of Morse code as I was not able to separate the sequence of dots and dashes into letters. I solved this by adding a space (" ") after each sequence that is printed to the screen. I then tried to run it and realized that it was separating the string into an array containing each individual character. I then had to separate it by the space that I had placed earlier. To do this I had to store the user's input into a string and split by the space character (" ").

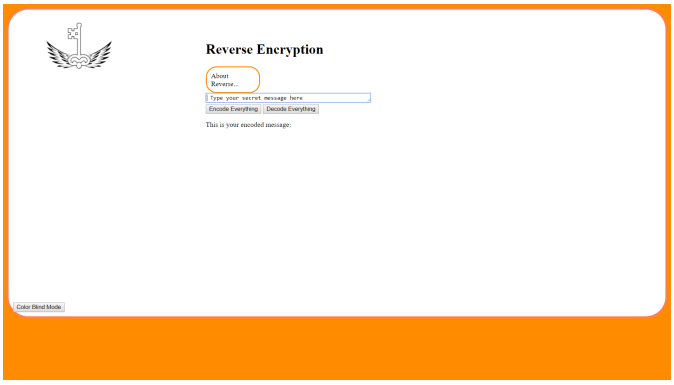

Figure 7: **The Reverse Cipher** - The Reverse Cipher page of my site (without hovering)