

# Cypher Site Report

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## Introduction

Cypher Site is the product of a coursework assignment for Web Technologies, where four different cyphers have been explored and implemented into the website(s) to enable the user to type in a message, encode this message, and also decode this message. The site has been developed with a strong emphasis on retaining a simple, and user friendly experience.

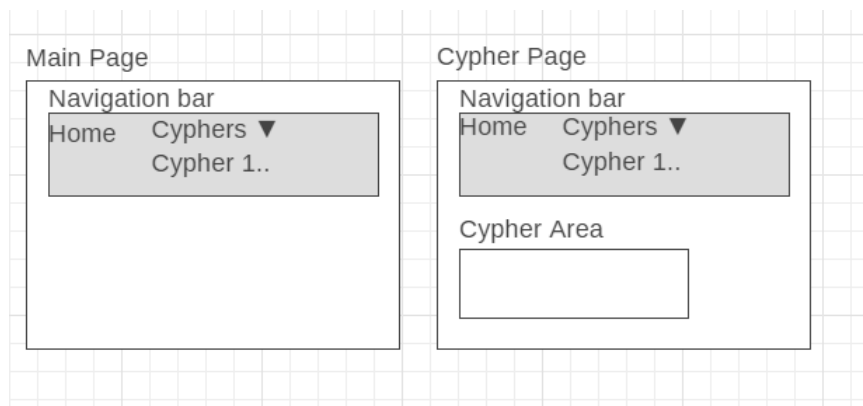
Each webpage consists of a header banner, that offers navigation through different links and a drop down menu to choose which cypher the user would like to use. When the user navigates to a page which is not the 'Home' page, this header becomes smaller to allow more space for the cyphers, further increasing the readability of the cypher area, and showing that the emphasis of that particular page is on the cyphers.

The cyphers used include the 'Rot13' cypher, which was used as a starting point to build upon for future cyphers. The 'Base64' cypher was used to show how simply something can be implemented when using a method which is already built into JavaScript. The 'Morse code' cypher is possibly the most well-known cypher included, the implementation shows how useful the JavaScript 'dictionary' is in a simple substitution solution. The final cypher used is the 'Atbash' cypher, which is simply the alphabet backwards, the implementation is similar to the Morse code one, but includes regular expressions (regex) to make it work correctly.

Many websites provided background reading which proved useful in the production of Cypher Site. A site which helped towards understanding different JavaScript and CSS features was W3Shools, I also took some ideas away from solutions posted on Stack overflow. The web technologies lab 05 also gave me a strong starting point with JavaScript, the rot13 solution shown was an incredibly helpful starting point.

## SOFTWARE DESIGN

The design process first began through looking at successful, elegant and simple webpages. For example, Google, where I noticed that the page makes good use of white space and uses a main 'bar' to search from. I went on to search for some well worked HTML and CSS designs, through resources such as YouTube, and Google images, I found a few examples of webpages which featured a navigation bar, drawing inspiration from this I knew that I needed to implement something like that in my webpage, as it seemed a perfect fit to have a menu which would link to different pages that hold different cyphers. I went on to use the website wireframe to create a mockup of what I had envisioned.



*Figure 1 shows an early design, detailing how key elements would be positioned on the page, featuring a drop down menu to choose between cyphers.*

I decided to put my cyphers on different pages, linking to them through the main page. In order to properly plan what each page would display, I created lists for the main page and the cypher page(s) detailing what I wanted to include on each page, key aspects of the list included the navigation bar being present throughout each page, I also wanted to include some sort of background picture to the navigation bar to make the site more vibrant.

On the cypher pages I planned to implement at least three different cyphers, including the Morse code cypher, and the ROT cypher. The output from each encode or decode would be generated using button(s), with the encoded or decoded text appearing in a separate text area to the one which took the users input.

## IMPLEMENTATION

Cypher Site's implementation features a navigation bar on each page which offers the user the ability to navigate between each webpage easily. This was created through mostly CSS, using HTML tags to split the page into what would be the header, and then setting the background picture of this header to be the background picture seen below. CSS was used to show only a specific part of this background picture, and also to determine how large the header would be through the padding and height features.

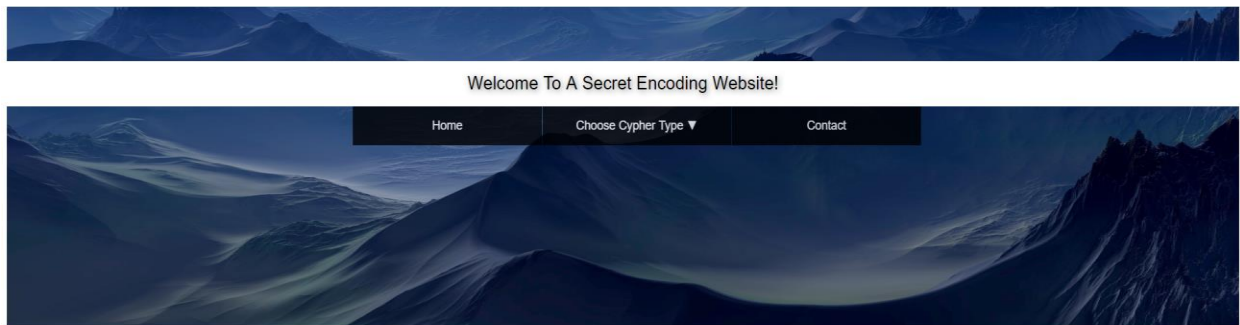


Figure 2 shows the heartbeat of the site, the header and navigation bar.

To choose between different cyphers, there is a drop down menu which displays links to another webpage which features the type of cypher that the user clicks on. This dropdown menu was created with list and unordered list tags, which were then targeted in CSS to create a list which has a dynamic feel, as the colours will change slightly whenever the user hovers their mouse over a hyperlink on the navigation banner.

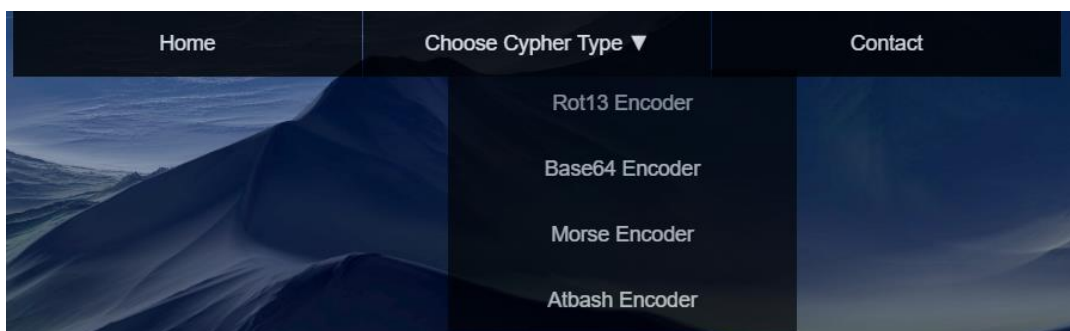


Figure 3 shows the dropdown menu.

When the user hovers over the 'Choose Cypher Type' area, a list will drop down revealing links towards the different cyphers, when the user highlights a selected link the background colour of that link changes colour slightly in order to make the user aware that they are in clicking-distance of following that link.

The different cypher pages all follow the same design, the only difference between them is the text displayed on the page to describe each cypher and the encoding and decoding methods used in JavaScript.

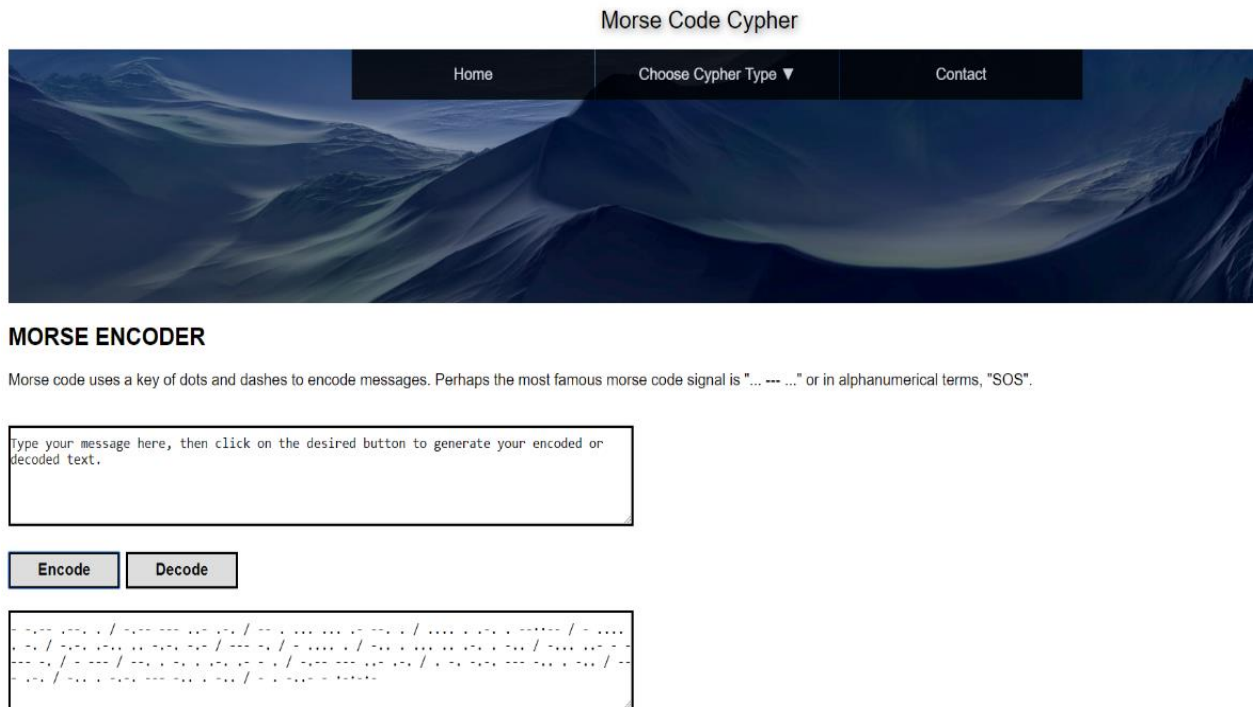


Figure 4 shows the design of the cypher pages, specifically the 'Morse code' cypher page.

The cypher page design implementation features two different text areas, one which holds the text to be encoded or decoded, and an area to show the output from the clicking of the button, the above image also shows the output from clicking the 'encode' button.

The design also features a 'Contact' page, which links to a webpage displaying contact information inside a bordered text area.

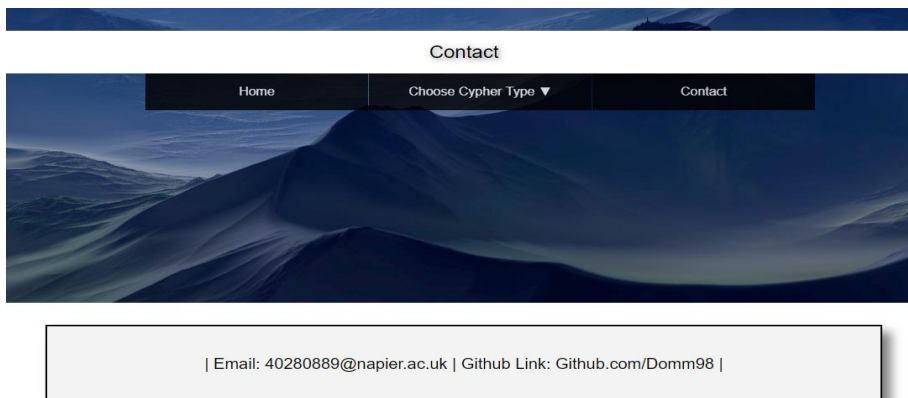


Figure 5 shows the 'contact' page

## CRITICAL EVALUATION

My implementation I feel is a good one, as for me it ticks all the boxes in comparison to the coursework specification. There is an area for the user to type in the message to be, and an area for this message's encoded or decoded result to be displayed. Different cyphers can be chosen from through the drop down menu in the navigation bar, and there is a way to process the cypher, in the form of buttons. The cyphers can also be deciphered to recover the user's original text.

The design I feel is also quite neat, with good use of colour and no overwhelming features which could hamper user experience. The design itself is quite simple yet effective, with clear instructions displayed on the page incase the user feels lost at any point. As should be expected, all cyphers function correctly.

The implementation could of course be improved, I failed to include any form of audio output, for example I could have included an option to have the output transmit through audio as well as text. I also planned for an additional page to be used to display some sort of gif or video, but in the end I felt as though the overall implementation would suffer with an addition of a silly video playing on a separate page. The cyphers I ended up implementing were also not incredibly complex, this could have been improved by adding an option on the 'Rot13' cypher to choose how many places you would like to rotate by.

## PERSONAL EVALUATION

At the beginning of this coursework I had very little practical skill when it came to developing a website, I had many ideas but no clue of how to implement them. Being forced to research more and dive deeper into HTML, CSS and JavaScript has given me a much wider toolset when it comes to web development, allowing me to recreate my ideas on a physical website successfully.

The areas I have learned the most in are definitely CSS and JavaScript. I only knew of CSS as something to change font sizes, colours etc. But now I have learned that it offers much more and is the key when it comes to designing a site, as everything can be altered and positioned through CSS with the use of elements such as padding, text alignment, shadowing, background pictures and colours. I found many challenges in CSS, which seen me spend hours playing with different features until I finally understood what each feature I have used actually does through a large amount of research on websites like YouTube and W3Schools. Overcoming my issues with CSS allowed me to implement a successful navigation bar, with a drop down bar which hides text until it is

needed through the 'display' method in CSS. Wrapping HTML elements in div tags was also a very powerful tool when using CSS, and I feel that I used tag wrapping well to isolate different areas of HTML to be altered through CSS.

JavaScript was the most difficult part for me, as I've never been great with Java coding and the course itself only had one lab on JavaScript. This meant that I had to really look into what I could do in JavaScript, and subsequently seen me waste what felt like days trying to do something that ended up having a simple solution, such as adding the punctuation and spacing back into the encoded or decoded message, in the end I found that regex provided the answer, after spending around four hours pointlessly playing with loops and arrays of course.

Overall I feel as though I performed quite well, with every specification being met and a few features which I feel went above the scope of the module. I feel as though the design is well executed and only increases the user experience throughout. I have definitely learned a large amount from this coursework, and had genuine fun in some areas when developing my website.

## References

Site used to create website plan: <https://wireframe.cc/>

JavaScript background reading: <https://www.w3schools.com/>

Stack overflow background reading: <https://stackoverflow.com/>

Background picture: <https://www.pexels.com/photo/abstract-background-bright-clouds-207130/>