Message Encryption Report

Introduction:

This report covers the development of a Message Encryption website that allows users to encrypt and decrypt messages using various coding mechanisms, including the ROT13 Caesar Cipher and Morse Code. The goal of this project was to create a user-friendly interface for encrypting and decrypting messages, while also exploring the implementation of different encryption algorithms. The background research for this project involved understanding the fundamentals of cryptography, including the history and principles of the ROT13 Caesar Cipher and Morse Code. This research provided the necessary foundation for designing and implementing the website's functionality.

Software Design:

Before starting the implementation, I planned the approach to the website's design and functionality. This included the following steps:

Requirements Gathering: I identified the key requirements for the website, which included the ability to:

1. Encrypt and decrypt messages using the ROT13 Caesar Cipher
2. Encrypt and decrypt messages using Morse Code
3. Provide a user-friendly interface for inputting and displaying the messages

Design: I created a simple Design to visualize the layout and structure of the website. This included the placement of the input field, dropdown menu for selecting the coding mechanism, and the output display.

Navigation Diagram: I sketched a basic navigation diagram to show how the different pages (or sections) of the website would be organized and connected.

Pseudocode: I wrote pseudocode to outline the high-level logic for the encryption and decryption functions, as well as the overall flow of the website's functionality.

Implementation

The website was implemented using HTML, CSS, and JavaScript. The main features of the website include:

Input Field: A text input field where the user can enter the message they want to encrypt or decrypt.

Coding Mechanism Dropdown: A dropdown menu that allows the user to select the coding mechanism they want to use (**ROT13 Caesar Cipher, Morse Code, Decryption for ROT13 Caesar Cipher, Decryption for Morse Code**).

Convert Message Button: A button that triggers the conversion of the input message based on the selected coding mechanism.

Output Display: A section that displays the encrypted or decrypted message.

The **JavaScript** code includes the following functions:

1. `rot13(text, decrypt) `: Applies the ROT13 Caesar Cipher to the input text, with an optional `decrypt` parameter to handle decryption.
2. `toMorseCode(plainText)`: Converts the input plain text to its Morse code representation.
3. `fromMorseCode(morseCode)`: Converts the input Morse code back to plain text.
4. `convertMessage()`: The main function that handles the conversion of the input message based on the selected coding mechanism.

Testing

To evaluate the implementation, I conducted the following tests:

Functional Testing:

1. Verified that the input field accepts text input correctly.
2. Tested the functionality of the dropdown menu to ensure that the correct coding mechanism is selected.
3. Checked that the "Convert Message" button triggers the conversion of the input message.
4. Validated the accuracy of the encrypted and decrypted messages for both the ROT13 Caesar Cipher and Morse Code.

Usability Testing:

1. Gathered feedback from a few users on the website's layout, ease of use, and overall user experience.
2. Incorporated their suggestions to improve the interface and make it more intuitive.

Edge Case Testing:

1. Tested the website's behavior with various input scenarios, including empty input, special characters, and unexpected input.
2. Ensured that the website handles these edge cases gracefully and provides appropriate feedback to the user.

Overall, the testing process helped identify and address any issues or areas for improvement in the website's implementation.

Personal Evaluation:

Through the development of this Message Encryption website, I gained valuable experience in the following areas:

Cryptography Fundamentals: I deepened my understanding of the ROT13 Caesar Cipher and Morse Code, including their history, principles, and practical applications.

Web Development Skills: I improved my proficiency in HTML, CSS, and JavaScript, particularly in the areas of DOM manipulation, event handling, and algorithm implementation.

Problem-Solving and Critical Thinking: Implementing the encryption and decryption functionalities required me to break down complex problems, design efficient algorithms, and troubleshoot any issues that arose during the development process.

User-Centric Design: Incorporating user feedback and focusing on the website's usability helped me develop a more user-friendly and intuitive interface.

The main challenge I faced was ensuring the accuracy and robustness of the encryption and decryption algorithms, especially for the Morse Code implementation. Handling edge cases and providing meaningful feedback to the user also required careful consideration.