Bachelor of IT (Computer Science)
Assignment 2 - Creative Coding Project
DXB211 - Creative Coding

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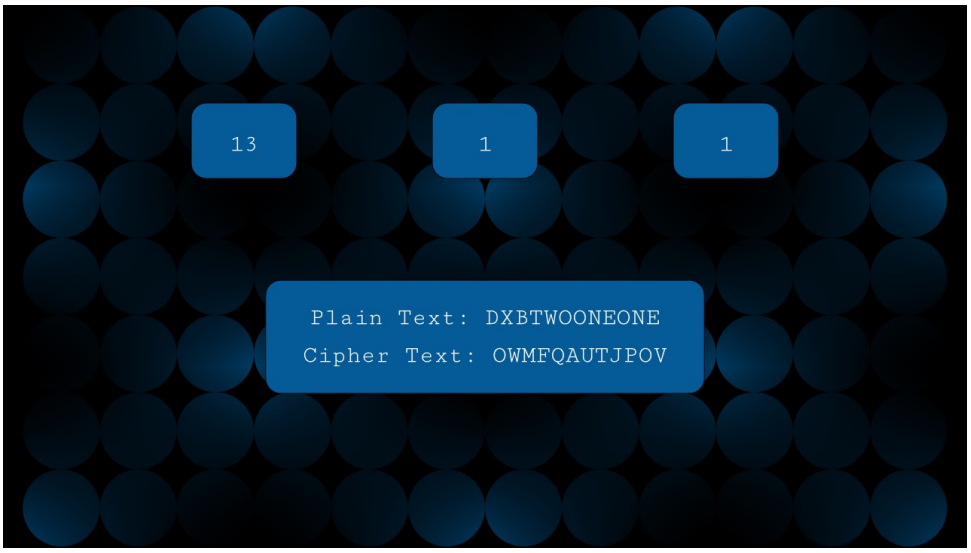
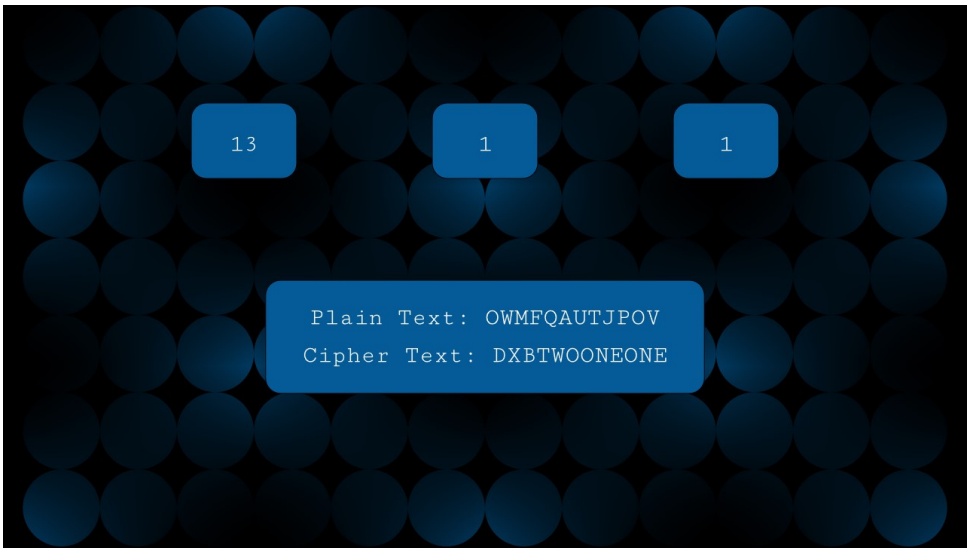
1 Introduction

In WWII Germany, Enigma was an instrumental tool in the German war effort. Enigma was a machine used to encrypt and decrypt intelligence communications between German forces. The sketch created for this assignment aims to simulate the Enigma machines encryption and decryption process.

To run this sketch you will need to run `python -m http.server` in the `src` folder of the project. Then navigate to `localhost:8000` in your web browser and open the `entry.html` file.

To use the sketch, set the three rotors to the desired positions, then simply type and plain text will be displayed next to the `Plain Text` heading along with the encrypted / decrypted text next to the `Cipher Text` heading.



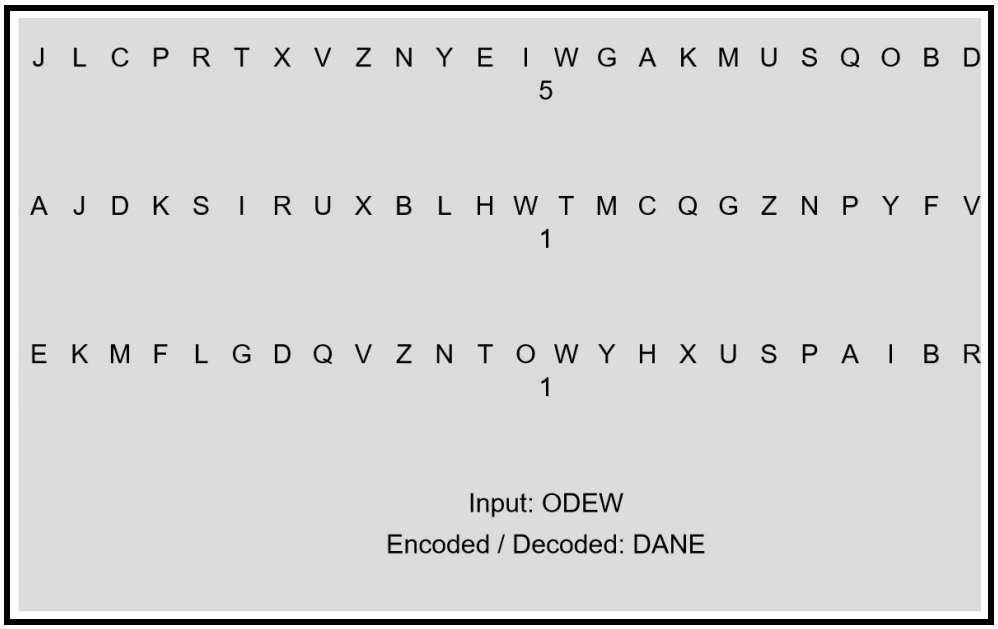


2 Design and Aesthetic

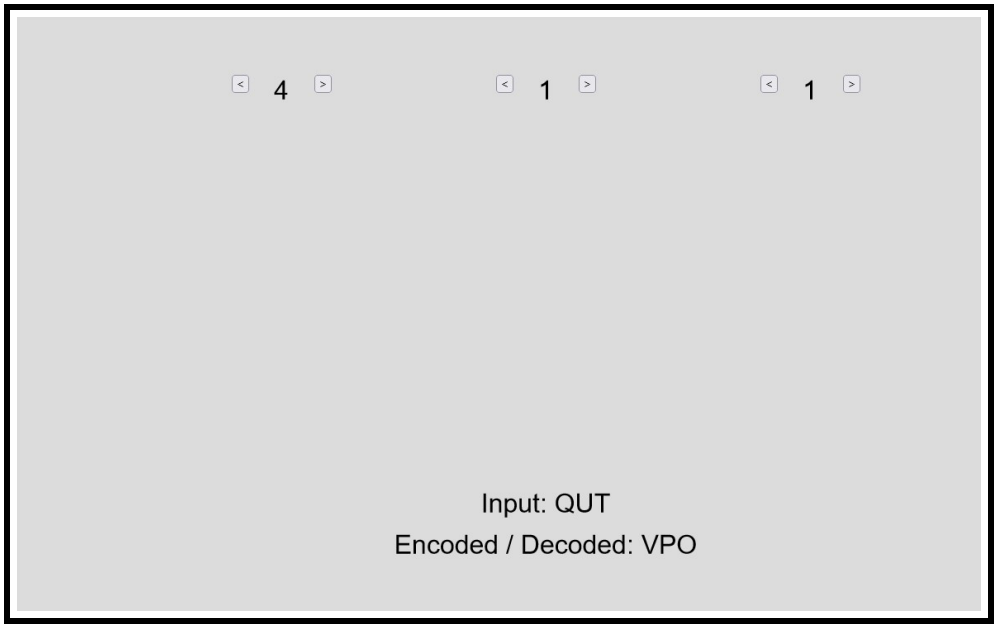
I chose to design a P5JS Enigma machine because I have always been interested in Cryptography and the cabinets in the brief reminded me of the Enigma machine. As such, creating a P5JS Enigma machine presented me with an opportunity to both learn more about cryptography whilst also creating an interesting and appealing sketch. I chose rounded boxes for the UI because i thought it made the sketch look more modern and visually apealing.

3 Design Process

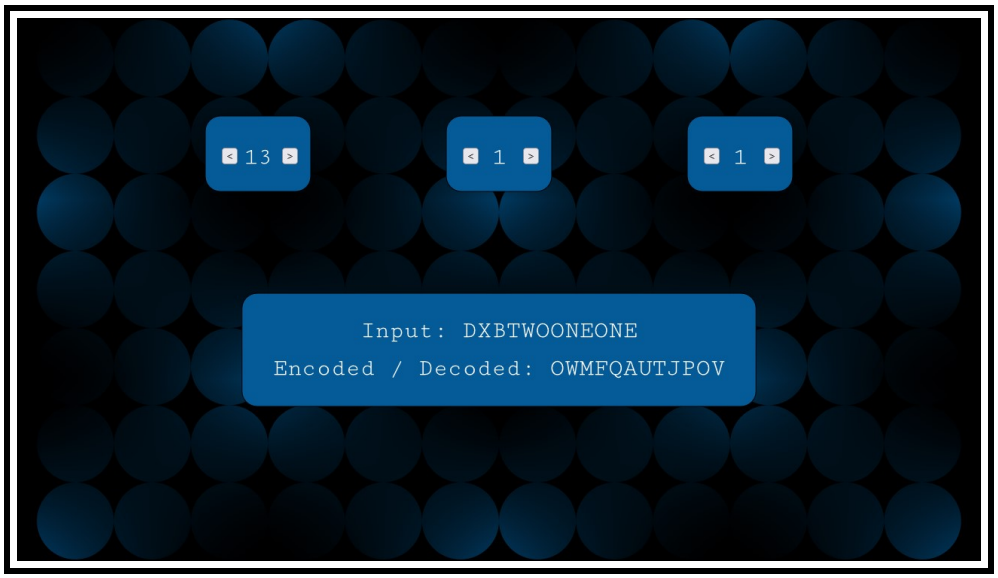
In the initial design of the sketch, I planned to have the rotors displayed stacked vertically in the center of the page. In this version of the sketch the actual values of the rotors would be displayed accross the page as strings of text and the user could only advance the rotor by clicking on it. There was not any way for the user to reverse the rotor at this point in time.



I thought this looked interesting but ultimately it served no purpose so I decided to remove it in favor of a more minimalistic design with a simple number to represent each rotor position. At this point I also took the liberty to chnage the arrangement of the rotor position numbers to be side by side at the top of the page.

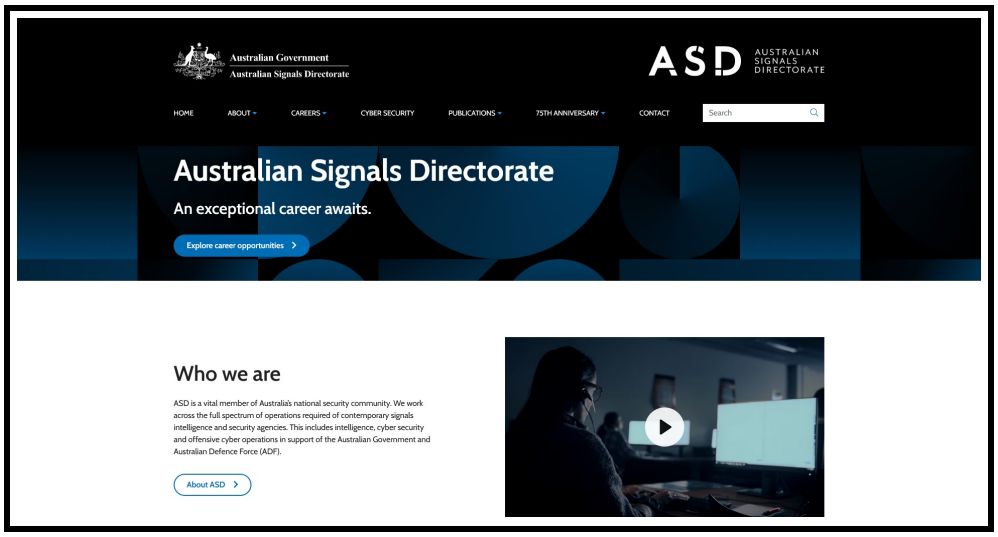


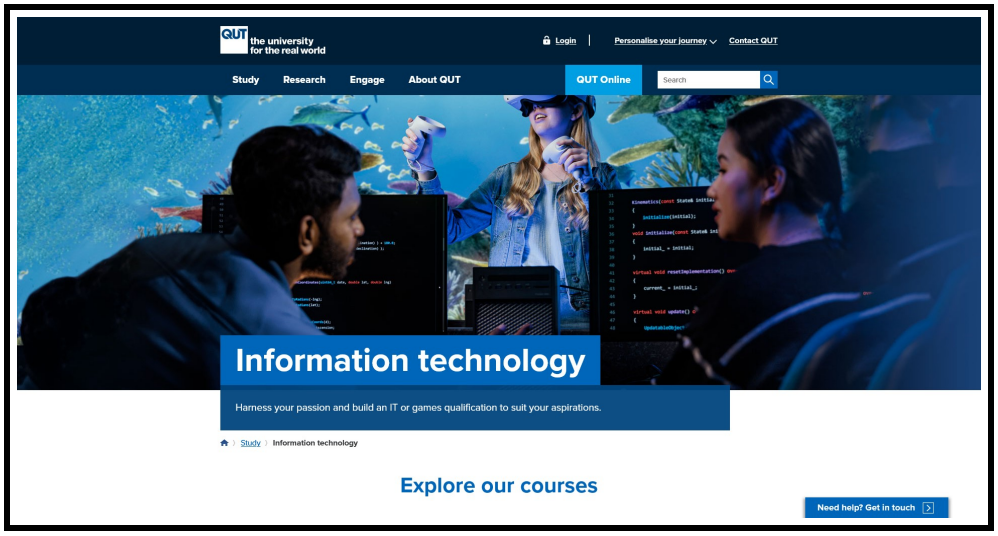
Finally I settled on the design shown in the introduction. I decided to move the text elements closer to the vertical center and added the background image and rounded squares to make the sketch look more interesting. At this point the sketch looks very similar to the final version with the only difference being the headings `Input` and `Encoded / Decoded`.



4 Creative Influences

The sketch has been designed to roughly resemble the style of the Australian Signals Directorate (2023) website. The ASD is the intelligence agency of Australia responsible for conducting signals intelligence on behalf of the Australian Government. As such, Cryptography is highly relevant to the ASD's work. Another source of styling was the website of Queensland University of Technology (2023), which shared a similar color scheme to the ASD website.





The last influence of the sketch was the Enigma machine itself. For my sketch I used the same number of rotors and reflector as the most common Enigma machine in WWII which I obtained from a website called Crypto Museum (2023).

5 References

Australian Signals Directorate. (2023). Australian Signals Directorate [Accessed: 2023-05-17]. https://www.asd.gov.au/

Crypto Museum. (2023). Enigma wiring [Accessed: 2023-05-17]. https://www.cryptomuseum.com/crypto/enigma/wiring.htm

Queensland University of Technology. (2023). Queensland University of Technology [Accessed: 2023-05-17]. https://www.qut.edu.au/study/information-technology?undergraduate