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CS: 405 Secure Coding

5-2 Activity: Encryption Coding

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This activity is a program designed to encrypt and decrypt text using a basic XOR encryption algorithm. The main function of the program is within the encrypt\_decrypt function, which takes two parameters: the source string to be encrypted or decrypted and the key to be used for the operation. It first calculates the lengths of both the source string and the key. By looping through each character of the source string, it applies XOR encryption/decryption using the corresponding character of the key. This process transforms the input string, and the result is returned as the output.

In addition to encryption and decryption functionality, the program includes several auxiliary functions. The read\_file function is responsible for reading the content of a specified file. It utilizes the ifstream library to open the file, read its contents into a string, and then close the file. However, in its current implementation, it contains a placeholder default string. In a real-world scenario, this function should read the data from the specified file. Another function, get\_student\_name, is tasked with extracting the student's name from a given string of data. It achieves this by searching for the first occurrence of a newline character and extracting the substring before it as the student's name. This function appears to be designed to extract metadata from input data, presumably to be used for organizational purposes or to maintain records.

Furthermore, the program includes a save\_data\_file function responsible for saving data to a file with a specified filename. Before writing to the file, this function retrieves the current date and time, formatting it as YYYY-MM-DD. It then proceeds to write the student's name, date, encryption key, and data to the file. This function ensures that the processed data is properly stored for later use or reference.

Overall, the main function of the program controls the entire process. It initializes necessary variables such as file names, reads data from a file, and sets an encryption key. After encrypting and saving the data to a new file, it subsequently decrypts and saves it again. Finally, it prints out the file names for the original, encrypted, and decrypted data.

\*\* As a heads up, I am having trouble with the debugging tool. I have included screenshots of my code. The last screenshot shows that the debugging tool only allows an attachment. I am unsure as to how I can resolve this issue.

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Description automatically generatedA computer screen with text on it

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