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CS 405

August 3, 2025

**Module Five Encryption Activity – Process Summary**

To complete this activity, I developed a C++ program that demonstrates secure XOR-based encryption and decryption. The program reads a formatted text file containing a student name and body of text, encrypts the content using a password key, and saves the encrypted result to a new file. It then decrypts the encrypted content using the same key and writes the result to a second output file, ensuring the original data can be fully restored.

The file loading was implemented using ifstream and stringstream to read the entire input into a string. The XOR encryption function was designed to handle any key length by cycling through the key using the modulo operator. I added input validation throughout the program to prevent issues like missing files, empty strings, or failed file writes. I also included logic to generate the current date in yyyy-mm-dd format and wrote it to the output file along with the student name, key, and the encrypted or decrypted content.

To verify the functionality of the program, I added a conditional check to compare the original input string to the decrypted output. If they did not match, the program would display a warning; otherwise, it confirmed that the encryption and decryption worked correctly. I tested this by temporarily modifying the key during decryption to force a mismatch and confirm that the error message appeared as expected.

One challenge I encountered was ensuring the input file was recognized at runtime. I resolved this by adding the file to the project and setting it to copy to the output directory. I also renamed the decrypted output file correctly to avoid any issues with inconsistent file names. Overall, the program runs successfully and produces both output files in the required format. The console output confirms that all steps completed without errors, and a screenshot of this output is included with the submission.

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AI-generated content may be incorrect.