UNIVERSITY PARTNER

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HERALD COLLEGE KATHMANDU

Module code:

4CS001

Module Name:

Introduction to Programming and Problem Solving

Module Assessment:

Coursework 1

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Introduction

Caeser cipher is an encryption technique used by Julius Caeser to send secret messages to his allies during war. In this technique, it involves shifting the letters in the plaintext message by a specific number of positions, referred to as the "shift" or "key." This technique was utilized to transmit covert messages to his supporters.

Implementation Overview

This code in Python demonstrates the implementation of the Caesar Cipher. It allows you to input the code manually or import it from a text file. There are two options available, encoding or decoding. The core functionality of the cipher lies within the 'encrypt' and 'decrypt' functions. These functions modify each letter based on the specified shift.

Questions

1. What are the most challenging aspect of the coursework task?

The most challenging aspect of the coursework task appears to be the implementation of file input and output functionality within the context of the Caesar Cipher logic. This complexity arises from the need to handle various scenarios associated with file operations. For instance, ensuring the program can gracefully handle situations where the specified file does not exist or contains unexpected content poses a challenge. Balancing the difficulties of file I/O while maintaining the overall integrity of the encryption and decryption processes introduces additional layers of complexity. Furthermore, the developer likely faced the task of validating and processing data from external files, requiring careful consideration of error-checking mechanisms. To ensure the program's reliability in real-world scenarios, this specific component of the assignment requires a solid understanding of Python file handling in addition to effective methods for locating and fixing mistakes.

2. How did you go about completing the task?

Finishing the task means following a step-by-step plan. I started with creating separate parts for the Caesar Cipher program. These parts can handle things like coding, decoding, checking files, and user inputs. These functions make the code easier to use again and more organized. They also make building the program step-by-step easier. The program uses loops to validate input, ensuring the user is prompted until valid input is received. This enhances the experience and prevents issues with wrong or unexpected inputs. Error handling was added, like checking for invalid shifts or non-numbers. The file processing involved checking filenames and encrypting/decrypting content line by line. Careful thought on errors and exception handling was needed.

3. What have you learned over the course of completing this coursework task?

By the completion of this coursework task, I have enhanced my understanding of Python programming, particularly in the context of cryptography with the Caesar Cipher. The task involved creating modular functions, handling user input, and implementing encryption and decryption logic. I learned to incorporate error handling for file operations, validate user inputs effectively, and structure code for readability and maintainability. Additionally, I gained insights into working with files in Python, using the 'with' statement for proper resource management. The task reinforced the importance of clear and concise commenting to enhance code comprehension. Overall, I have gained valuable expertise in problem-solving, implementing algorithms, and promoting effective programming methodologies. It has offered me practical knowledge in user interaction, input validation, and file management, which are vital proficiencies in the field of software development.

Conclusion

The Caesar Cipher is an important historical illustration of early encryption practices. While it is not considered secure for modern applications, understanding its principles is essential for studying the fundamentals of cryptology. The provided Python code serves as a practical real-world demonstration of the Caesar Cipher. It is a valuable educational resource for individuals interested in gaining knowledge about cryptology and coding.