Secure File Transfer Simulation

Technology: C Programming (Win32 SDK, DLL)

Project Overview

A **Windows-based simulation project** that demonstrates the concept of **cryptography and system-level programming** using the **Win32 SDK**

The project implements **Caesar Cipher** and **XOR Cipher and Vigenère Cipher**

for encryption/decryption and performs file handling via **Windows system calls** instead of standard C library functions.

The cryptographic logic is modularized into a **Dynamic Link Library (DLL)**, making the functionality reusable by multiple client applications.

This project showcases **low-level programming, system calls, and DLL development** in a practical and secure context.

Key Features

- **File-based Encryption & Decryption**
  - Supports secure encryption/decryption of text files.
- **Multiple Algorithms Implemented**
  - **Caesar Cipher** (character shift-based substitution)
  - **XOR Cipher** (bitwise XOR with user-defined key)
  - **Vigenere Cipher** (polyalphabetic character shift using a repeating key)
- **System-Level File Handling**
  - Uses **Win32 SDK APIs** (CreateFile, ReadFile, WriteFile, CloseHandle) instead of high-level C functions.
- **DLL Integration**
  - Exported reusable functions through a **custom DLL**.
  - Client applications dynamically load and use encryption/decryption services
- **Low-Level Programming Practice**
  - Worked extensively with **pointers, buffers, and string processing**.
  - Strengthened debugging skills with **Visual Studio** and Windows tools.

Skills Highlighted

- Proficiency in **C programming** and **Win32 SDK system programming**.
- Experience in **DLL creation, exporting/importing functions**, and client integration.
- Strong understanding of **Windows API for file I/O** and process handling.
- Practical knowledge of **cryptographic techniques** (Caesar & XOR cipher & Vigenere cipher).
- Hands-on with **modular project development** and **secure file transfer concepts**.

GitHub Repository

Example Usage

Encrypt a file

encrypt.exe input.txt output.enc key

Decrypt a file

decrypt.exe output.enc recovered.txt key