



King Abdul-Aziz University
Faculty of Computing and Information Technology
Computer Science Department
CPCS 425 Information Security Course Fall 2023
Project



Cipher Application

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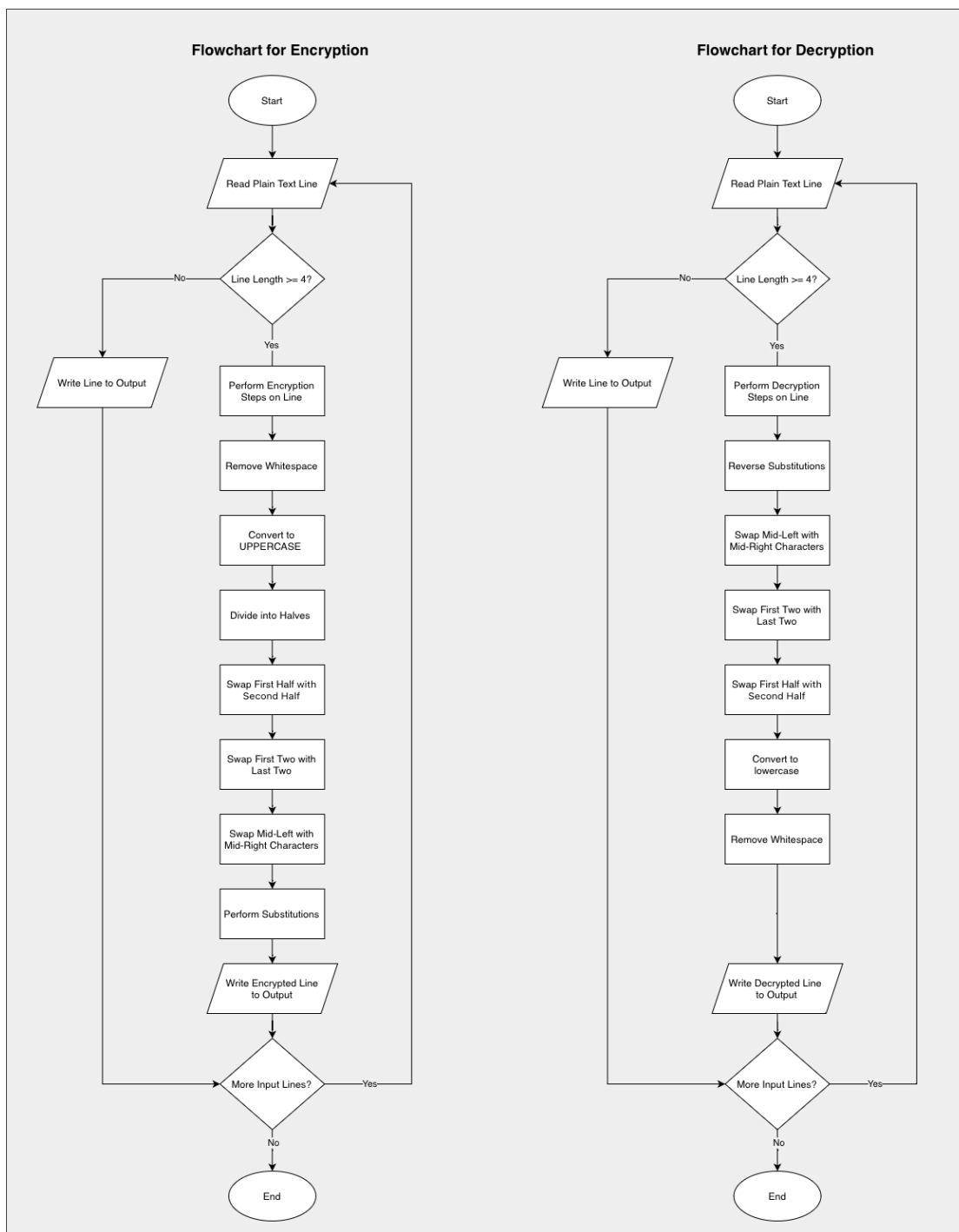
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1. Introduction

This report provides an overview of the Cipher Application project, which focuses on implementing encryption and decryption functionalities for text messages. With the increasing importance of data security and privacy, cryptography plays a crucial role in safeguarding sensitive information. The Cipher Application project aims to introduce the practical aspects of encryption and decryption by developing a Java program. This report will outline the project's objectives, discuss the encryption and decryption processes, present visual flowcharts and pseudocode, showcase screenshots of the application, and conclude with critical findings. By the end of this report, readers will have a clear understanding of the Cipher Application project and its relevance in information security.

2. Flowchart



3. Pseudocode

// Cipher Application Pseudo Code

```
class Cipher {  
  function encrypt(inStream, outStream):  
    while there is data in inStream:  
      read a line from inStream  
      if the line length is at least 4 characters:  
        remove leading and trailing whitespace from the line  
        convert all letters in the line to UPPERCASE  
        divide the line into two halves (first half contains one more character for odd-length lines)  
        swap the first half with the second half  
        swap the first two characters with the last two characters  
        swap the two characters immediately to the left of the middle with the two characters that follow them  
        perform character substitutions (A->@, E->=, I->!, etc.)  
  
        write the encrypted line to outStream  
      else:  
        write the line as it is to outStream  
  
  function decrypt(inStream, outStream):  
    while there is data in inStream:  
      read a line from inStream  
      reverse the character substitutions (e.g., @->A, =->E, !->I, etc.)  
      remove leading and trailing whitespace from the line  
      swap the two characters immediately to the right of the middle with the two characters that precede them  
      swap the first two characters with the last two characters  
      divide the line into two halves (first half contains one less character for odd-length lines)  
      convert all letters in the line to lowercase  
  
      write the decrypted line to outStream  
}  
  
// Create a new instance of the Cipher class  
cipher = new Cipher()  
  
// Call the encrypt() function to encrypt a file  
// inputStream is the input stream containing the data to be encrypted  
// outputStream is the output stream where the encrypted data will be written  
cipher.encrypt(inputStream, outputStream)  
  
// Call the decrypt() function to decrypt a file  
// inputStream is the input stream containing the data to be decrypted  
// outputStream is the output stream where the decrypted data will be written  
cipher.decrypt(inputStream, outputStream)
```

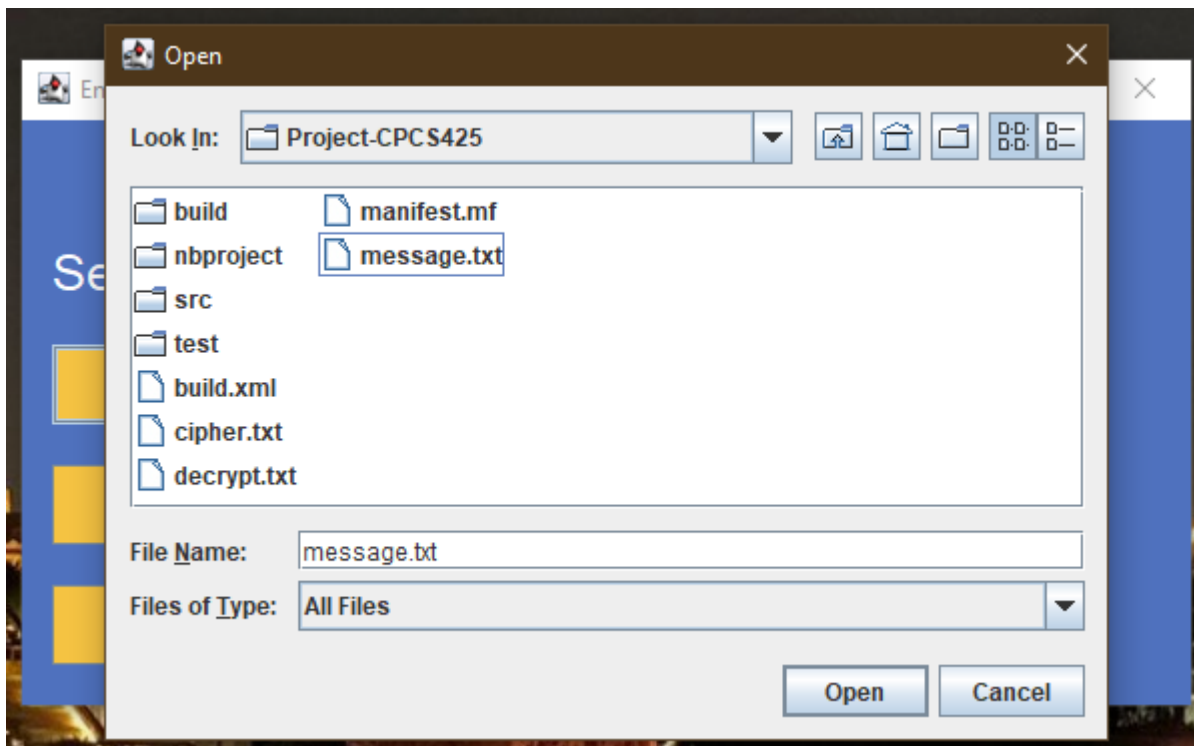
4. Screenshot

Step 1:

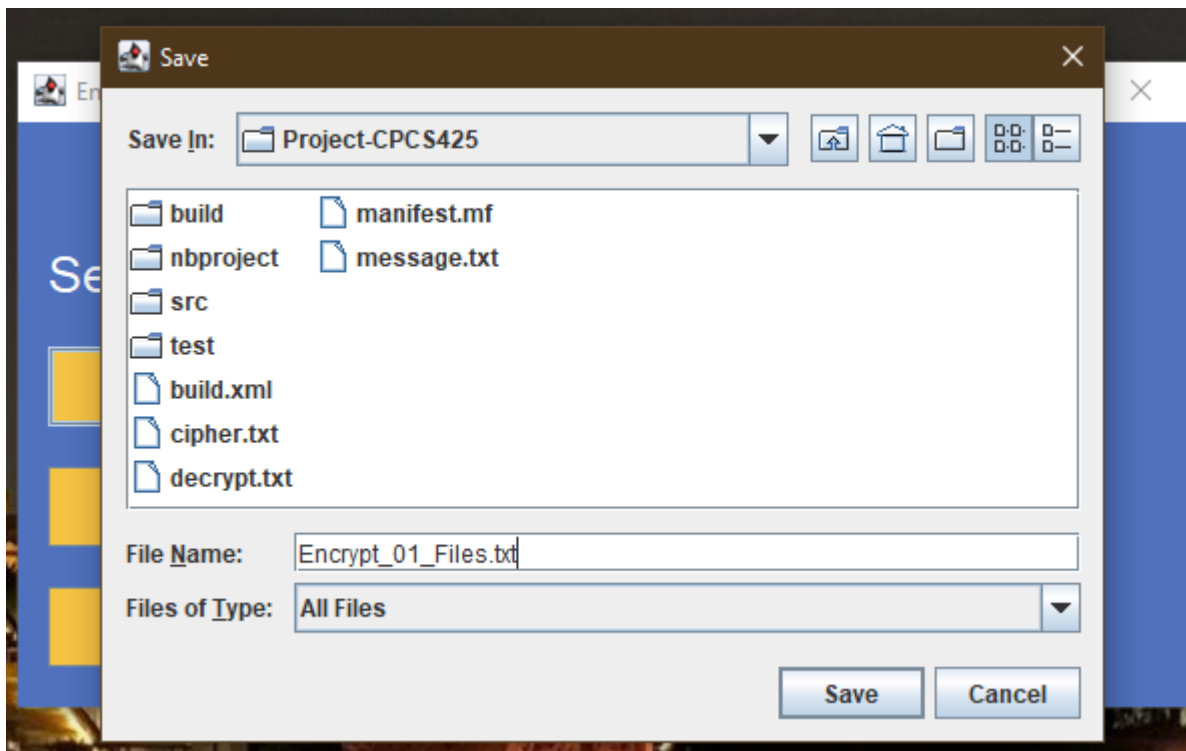


A) If the user select 1- Encrypt Files

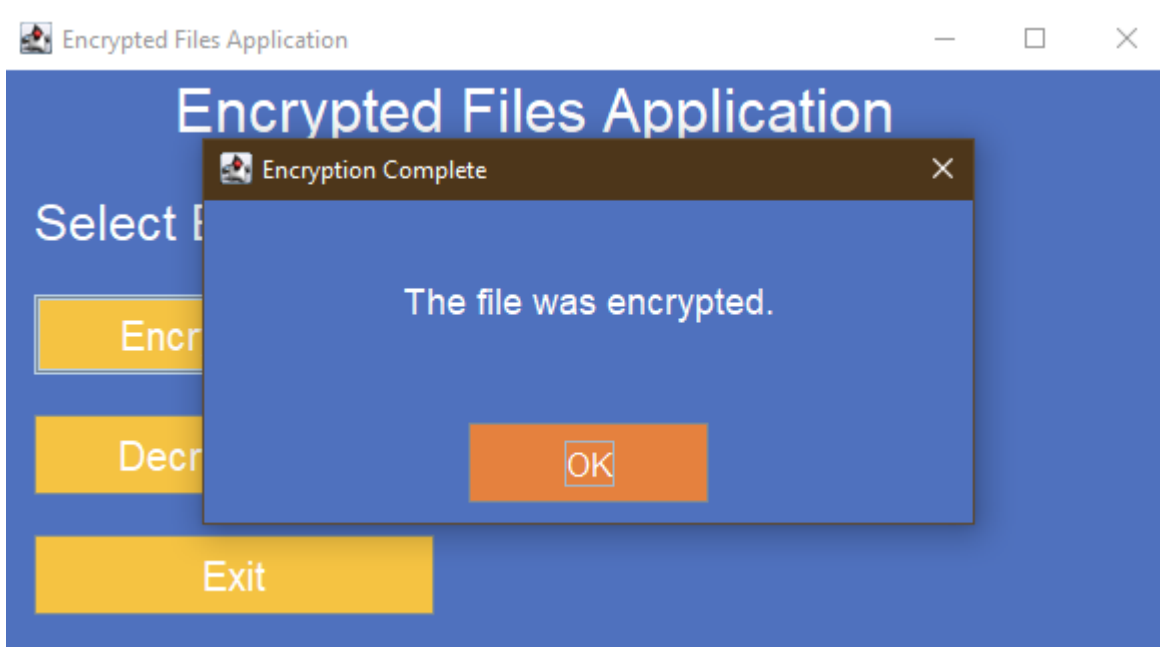
Step 2: Select the file.



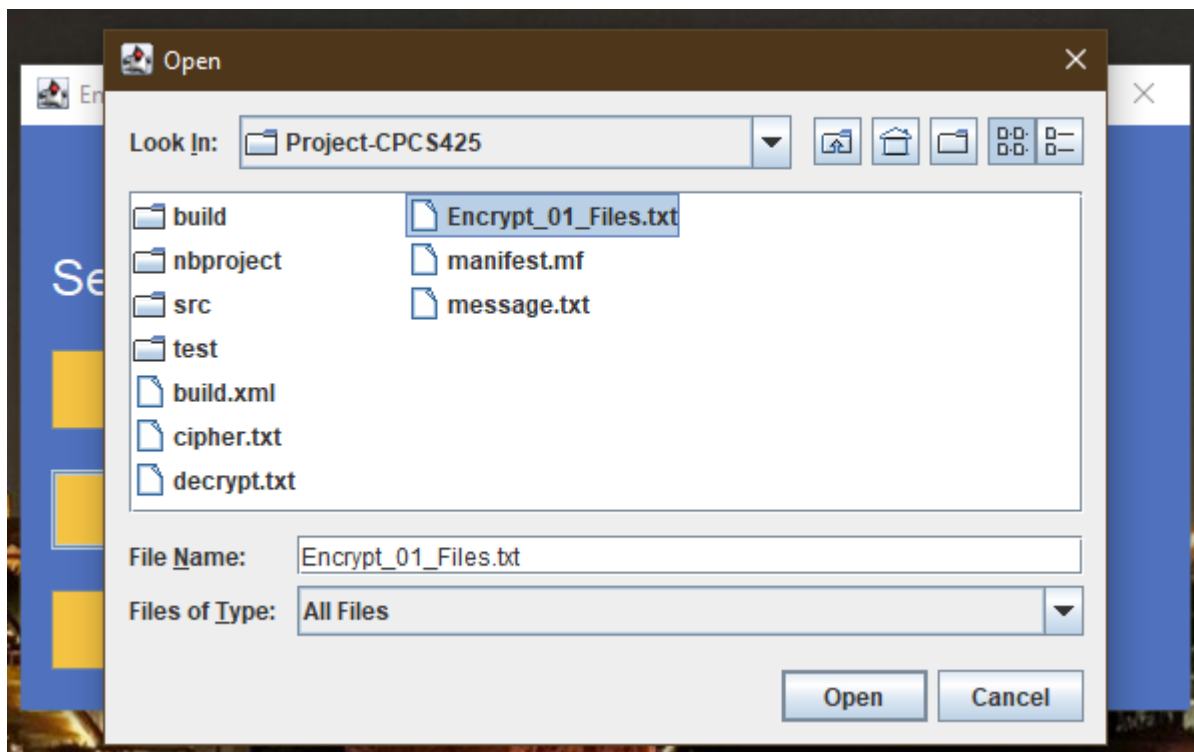
Step 3: Select the destination.



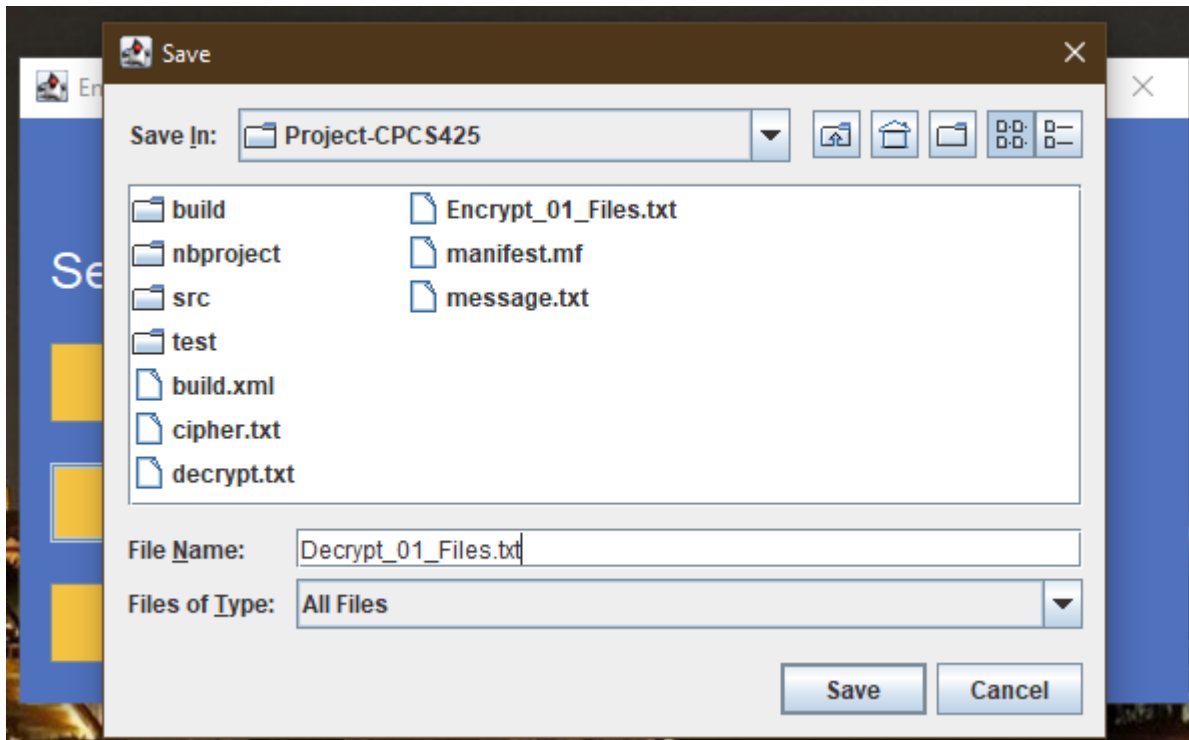
Step 4: Finish the encryption.



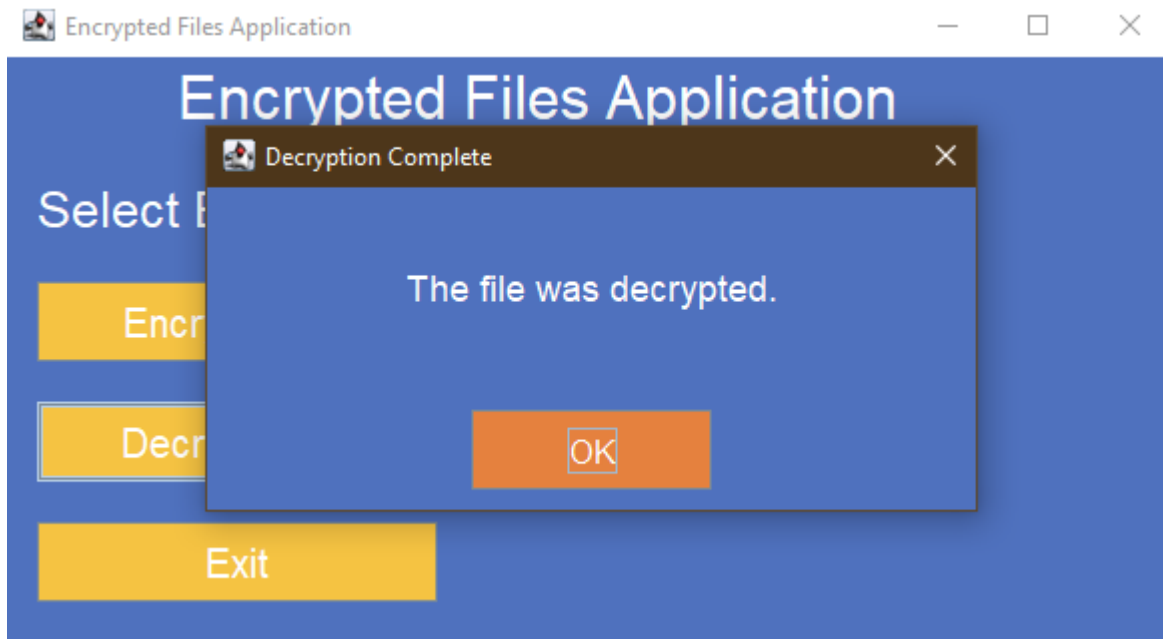
B) If the user select 2- Dncrypt Files
Step 1: Select the file.



Step 2: Select the destination.



Step 3: Finish the decryption.



5. Conclusion

In conclusion, the Cipher Application project has provided a practical understanding of encryption and decryption techniques for text messages. We have explored the fundamentals of cryptography and its role in data security by developing a Java program. The visual flowcharts, pseudocode, and screenshots have enhanced our comprehension of the encryption and decryption processes. This project has equipped us with the skills to encrypt and decrypt text messages using classical encryption techniques. We can apply this knowledge to protect sensitive information and contribute to a more secure digital environment.