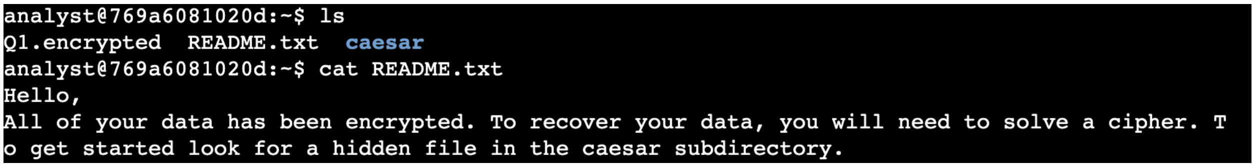
DECRYPTING DATA USING CIPHER AND OPENSSL

Project Description

The task was to recover encrypted data by working through a series of steps that involved exploring directories, reading files, decoding a classical cipher, and finally decrypting the target file using OpenSSL. This exercise combined file system navigation, cryptography, and Linux command-line tools to restore the file to its original state.

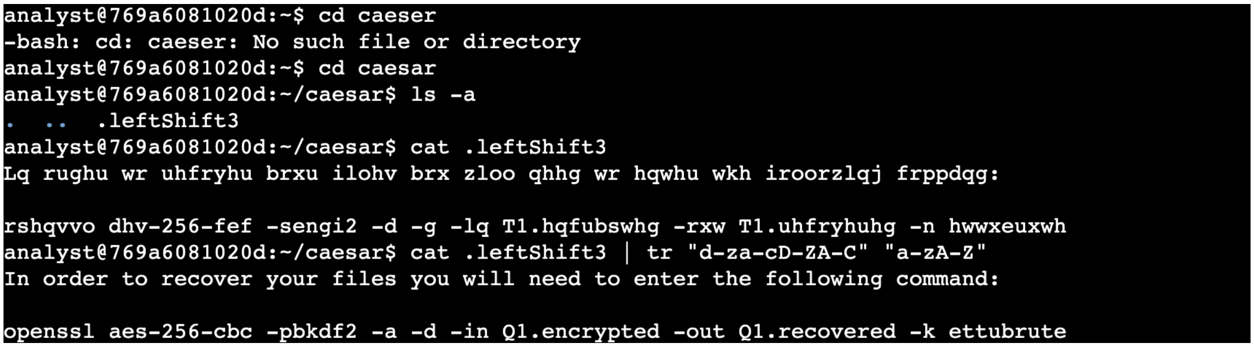
Steps Performed

I started by listing the contents of the working directory, where I found three items: Q1.encrypted, README.txt, and a folder named “caesar”. Reading the README.txt file revealed instructions that all the data had been encrypted and that I needed to solve a cipher. The note directed me to look for a hidden file inside the “caesar” directory.



```
analyst@769a6081020d:~$ ls
Q1.encrypted  README.txt  caesar
analyst@769a6081020d:~$ cat README.txt
Hello,
All of your data has been encrypted. To recover your data, you will need to solve a cipher. T
o get started look for a hidden file in the caesar subdirectory.
```

Next, I navigated into the “caesar” subdirectory and used “ls -a” to reveal hidden files. This uncovered “.leftShift3”, which contained text encoded with a classical Caesar cipher. By using the “tr” command to shift the alphabet three places to the left, I successfully translated the ciphertext into plaintext instructions.

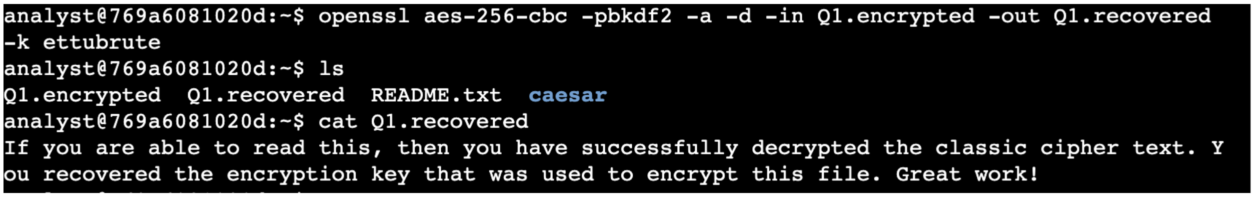


```
analyst@769a6081020d:~$ cd caeser
-bash: cd: caeser: No such file or directory
analyst@769a6081020d:~$ cd caesar
analyst@769a6081020d:~/caesar$ ls -a
.  ..  .leftShift3
analyst@769a6081020d:~/caesar$ cat .leftShift3
Lq rughu wr uhfryhu brxu ilohv brx zloo qhhg wr hqwhu wkh iroorzlqj frppdqg:

rshqvvo dhv-256-fef -sengi2 -d -g -lq T1.hqfubswhg -rxw T1.uhfryhuhg -n hwwxeuxwh
analyst@769a6081020d:~/caesar$ cat .leftShift3 | tr "d-za-cD-ZA-C" "a-zA-Z"
In order to recover your files you will need to enter the following command:

openssl aes-256-cbc -pbkdf2 -a -d -in Q1.encrypted -out Q1.recovered -k ettubrute
```

The decoded message provided the exact “openssl” command and decryption key required to restore the encrypted file. Using these details, I ran the OpenSSL command, which decrypted Q1.encrypted and produced a new output file, Q1.recovered.



```
analyst@769a6081020d:~$ openssl aes-256-cbc -pbkdf2 -a -d -in Q1.encrypted -out Q1.recovered
-k ettubrute
analyst@769a6081020d:~$ ls
Q1.encrypted  Q1.recovered  README.txt  caesar
analyst@769a6081020d:~$ cat Q1.recovered
If you are able to read this, then you have successfully decrypted the classic cipher text. Y
ou recovered the encryption key that was used to encrypt this file. Great work!
```

Finally, I opened Q1.recovered and confirmed that it contained a readable confirmation message. This verified that the decryption was successful and that the file had been restored to its original state.

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Summary

In this project, I practiced listing directories, reading file contents, applying Linux commands to decode a Caesar cipher, and using OpenSSL to decrypt a file. These steps demonstrated how classical cryptography and modern encryption tools can be combined to securely protect and successfully recover data.