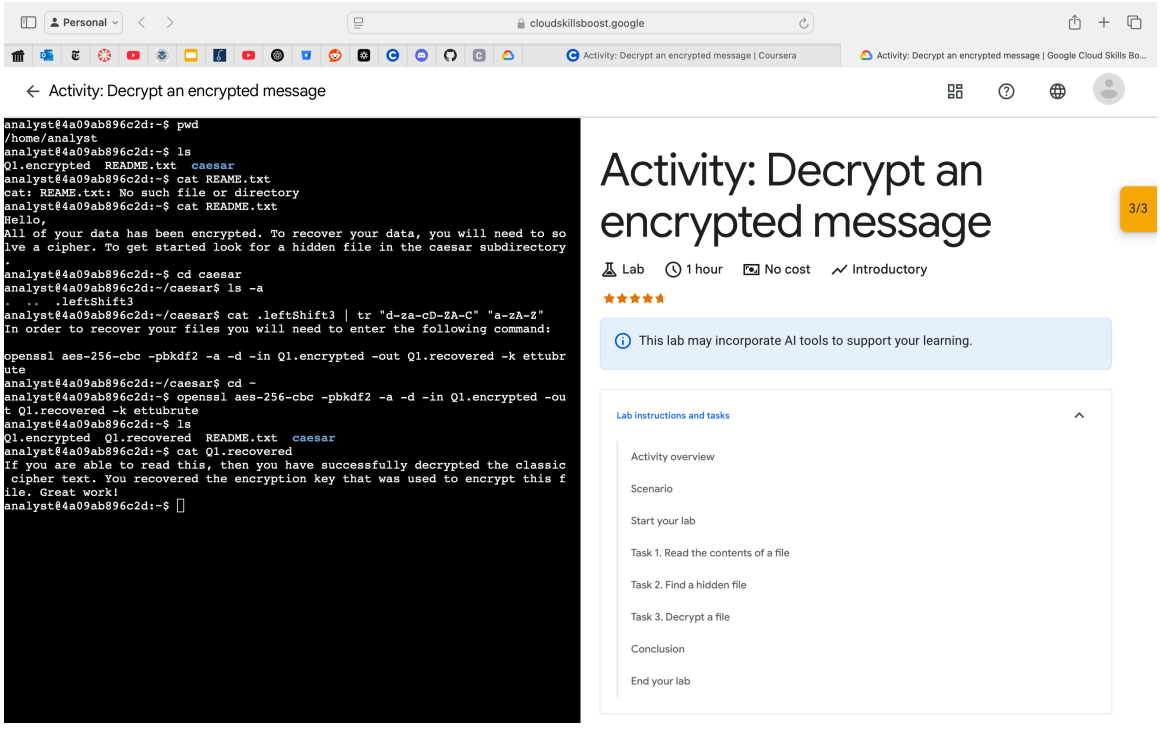
🔐 PROJECT 2: FILE ENCRYPTION & DECRYPTION (OpenSSL + Caesar Cipher)

📸 **Screenshot:**

```
analyst@4a09ab896c2d:~$ pwd
/home/analyst
analyst@4a09ab896c2d:~$ ls
Q1.encrypted  README.txt  caesar
analyst@4a09ab896c2d:~$ cat REAME.txt
cat: REAME.txt: No such file or directory
analyst@4a09ab896c2d:~$ cat README.txt
Hello,
All of your data has been encrypted. To recover your data, you will need to so
lve a cipher. To get started look for a hidden file in the caesar subdirectory
.
analyst@4a09ab896c2d:~$ cd caesar
analyst@4a09ab896c2d:~/caesar$ ls -a
.  ..  .leftShift3
analyst@4a09ab896c2d:~/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 ettubr
ute
analyst@4a09ab896c2d:~/caesar$ cd ~
analyst@4a09ab896c2d:~$ openssl aes-256-cbc -pbkdf2 -a -d -in Q1.encrypted -ou
t Q1.recovered -k ettubrute
analyst@4a09ab896c2d:~$ ls
Q1.encrypted  Q1.recovered  README.txt  caesar
analyst@4a09ab896c2d:~$ cat Q1.recovered
If you are able to read this, then you have successfully decrypted the classic
 cipher text. You recovered the encryption key that was used to encrypt this f
ile. Great work!
analyst@4a09ab896c2d:~$
```

📸 Screenshot



🔧 Description: Hybrid Challenge — Symmetric AES-256 encryption + Caesar cipher decoding

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🧪 What I Did

This project simulates a real-world decryption task using:

- A hidden Caesar cipher to reveal a key.
- AES-256-CBC encryption with OpenSSL for secure file handling.

Step-by-Step Process:

1. **Read the warning from README.txt:**

   I saw a message stating that files had been encrypted and that I'd need to "solve a cipher" to decrypt them.

2. **Navigated to the caesar folder:**

Listed files and discovered .leftShift3, a text file used for Caesar cipher decoding.

3. **Used tr to decode the cipher:**

   Command used:

```
cat .leftShift3 | tr "d-za-cD-ZA-C" "a-zA-Z"
```

3. This translated the Caesar cipher back into readable instructions. It revealed the decryption key (ettubrrute) and how to use it.
4. **Ran OpenSSL AES-256 decryption command:**

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

4. **Recovered the file:**

   I opened Q1.recovered, which confirmed successful decryption of a file containing instructions or validation of the key used.

Skills Applied

Area	Description
Cipher Analysis	Practiced Caesar cipher decryption using Linux tools (tr)
OpenSSL Decryption	Ran a real-world symmetric encryption decryption using AES-256
File Forensics	Understood how attackers may encrypt data and how defenders can recover it if the key is leaked
CLI Navigation	Used bash commands to inspect, analyze, and decrypt files

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Real-World Benefits

- **Cryptography Awareness:** I now understand how both symmetric and classical encryption techniques work, especially in ransomware scenarios.
- **Blue Team Relevance:** If attackers encrypt files and leave ransom notes, I can investigate folders, decode ciphers, and try brute-force or leaked key decryption.
- **Tool Usage:** openssl is widely used in file encryption and SSL/TLS, so knowing how it works is essential in cyber defense.
