Group 7

Step 2: Action

Team Members:-

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Memo: Implementation of Recursive Directory Encryption/Decryption Component

Objective:

This component's goal is to encrypt all files inside a given directory structure such that all its subdirectories and their contents are encrypted and then enable decryption of those files.

Implementation Details:-

Programming Language : python
Cryptography library: pycryptodome
Encryption Algorithm used: AES

We chose AES for its high security and performance. The AES encryption key which is required to encrypt/decrypt is to be 16 bytes in length, aligning with the AES-128 bit encryption standards. The component is designed to recursively navigate through the specified directory and its subsidiaries, applying encryption to every file it encounters. This is achieved through the os.walk function in python. Upon encryption, each file's extension is modified to '.enc' and the original file is deleted to ensure that only the encrypted version remains. During decryption, the process is reversed and the original file extensions are restored. The component includes detailed logging for both encryption and decryption and the script includes error handling to manage exceptions.

The program can be run using the command

python final.py <encrypt|decrypt> <directory> <key>

<encrypt|decrypt> specifies the operation
<directory> is the target directory for encryption or decryption
<key> is the 16 byte AES encryption key

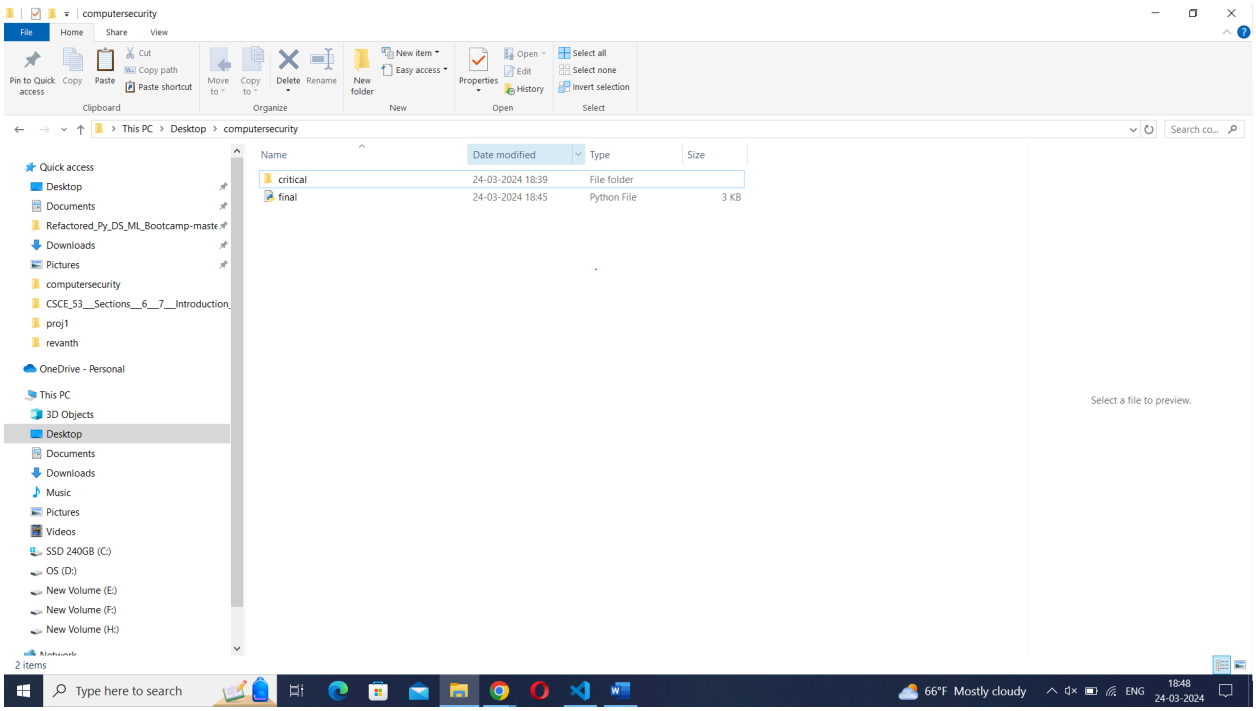
Note:- The same key should be given to Decryption which was given during Encryption, else the files won't be decrypted.

Requirements to run scripts:-

1. Python
2. Pycryptodome (pip install pycryptodome)

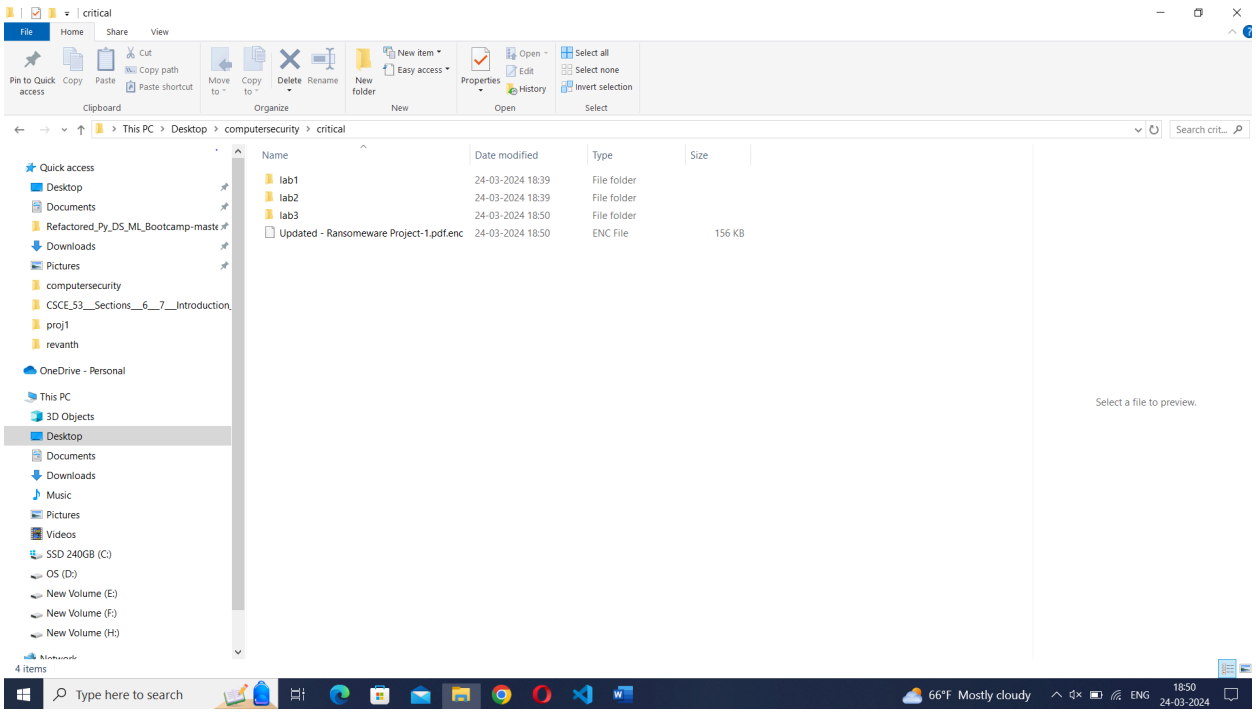
Screenshots:

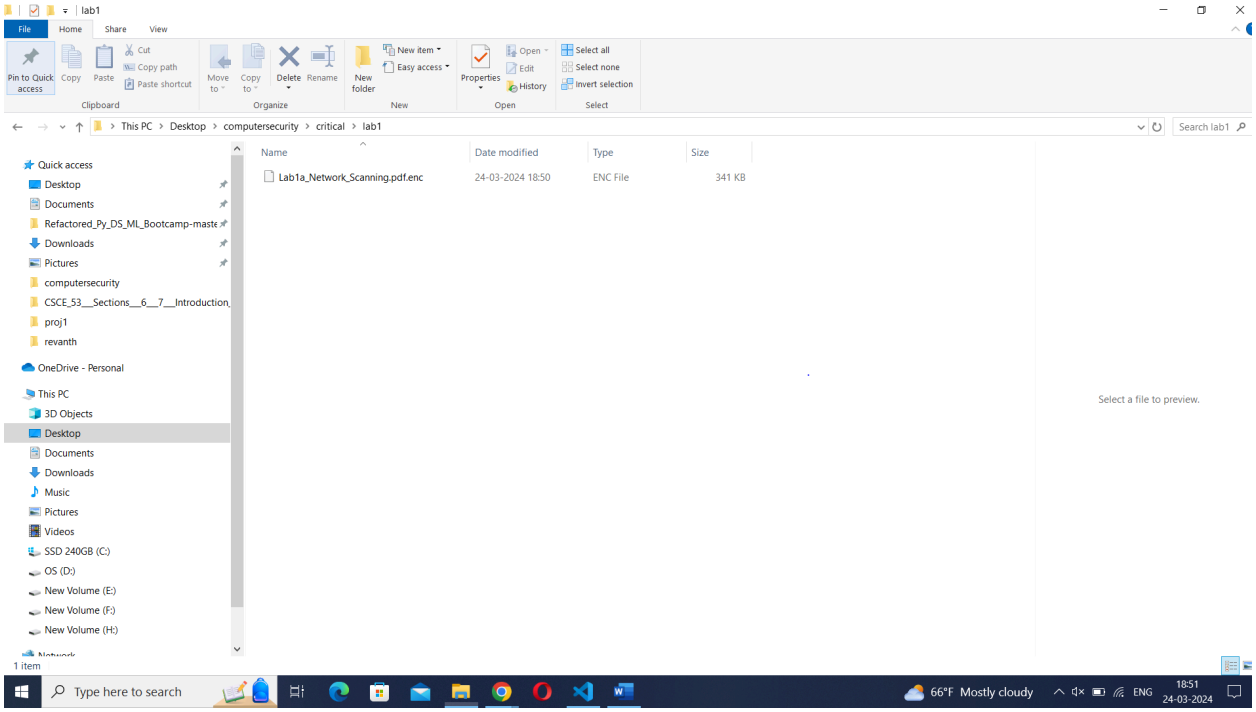
Project Structure:



After Encryption:

```
PS C:\Users\vamshi\Desktop\computersecurity> python final.py encrypt c://Users//vamshi//Desktop//computersecurity//critical 1122334455667788
INFO:root:File 'c://Users//vamshi//Desktop//computersecurity//critical\Updated - Ransomeware Project-1.pdf' encrypted successfully.
INFO:root:File 'c://Users//vamshi//Desktop//computersecurity//critical\lab1\Lab1a_Network_Scanning.pdf' encrypted successfully.
INFO:root:File 'c://Users//vamshi//Desktop//computersecurity//critical\lab2\Lab1b_Packet_Sniffing.pdf' encrypted successfully.
INFO:root:File 'c://Users//vamshi//Desktop//computersecurity//critical\lab3\Lab2_Firewalls_IDS.pdf' encrypted successfully.
```

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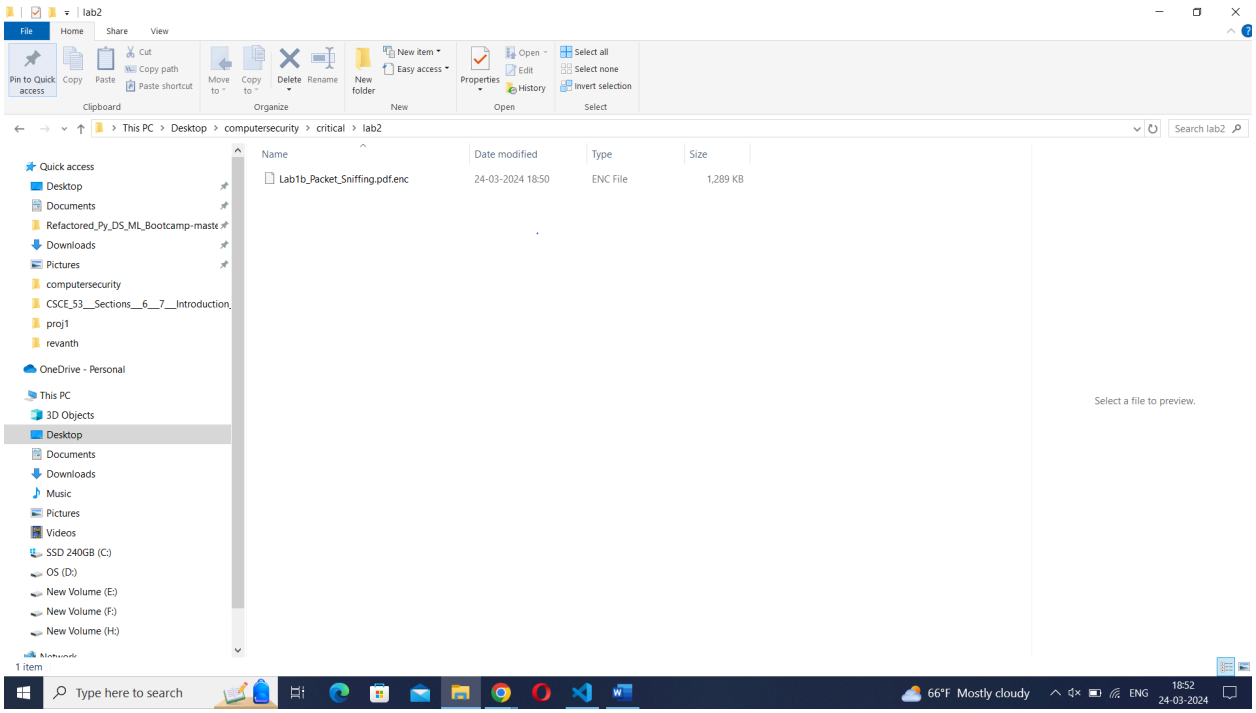
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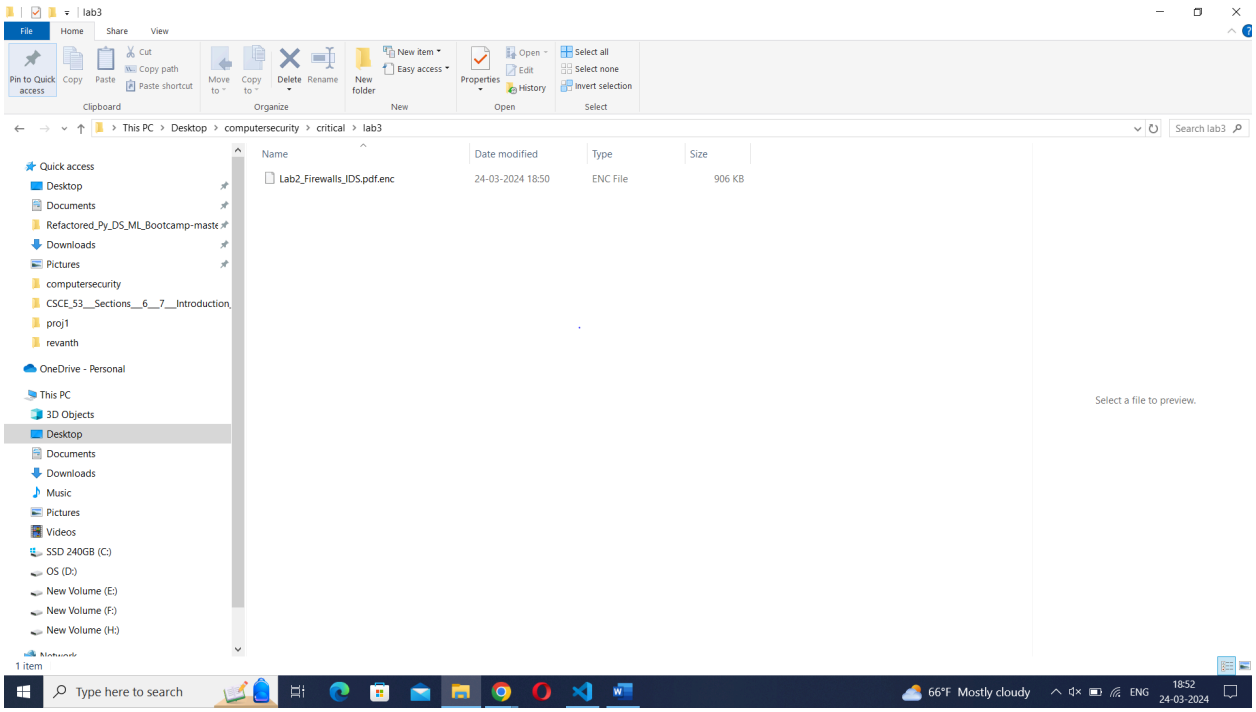
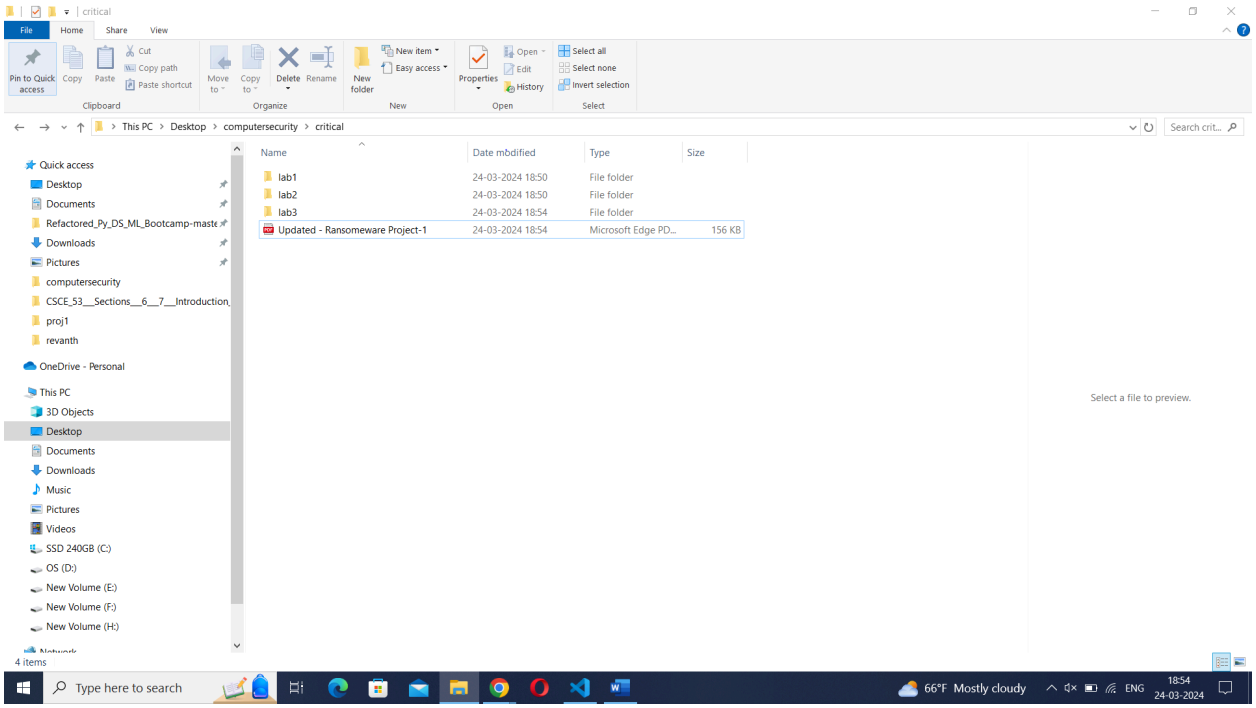


After Decryption:-

```
PS C:\Users\vamshi\Desktop\computersecurity> python final.py decrypt  c://Users//vamshi//Desktop//computersecurity//critical 1122334455667788
INFO:root:File 'c://Users//vamshi//Desktop//computersecurity//critical\Updated - Ransomeware Project-1.pdf.enc' decrypted successfully.
INFO:root:File 'c://Users//vamshi//Desktop//computersecurity//critical\lab1\Lab1a_Network_Scanning.pdf.enc' decrypted successfully.
INFO:root:File 'c://Users//vamshi//Desktop//computersecurity//critical\lab2\Lab1b_Packet_Sniffing.pdf.enc' decrypted successfully.
INFO:root:File 'c://Users//vamshi//Desktop//computersecurity//critical\lab3\Lab2_Firewalls_IDS.pdf.enc' decrypted successfully.
```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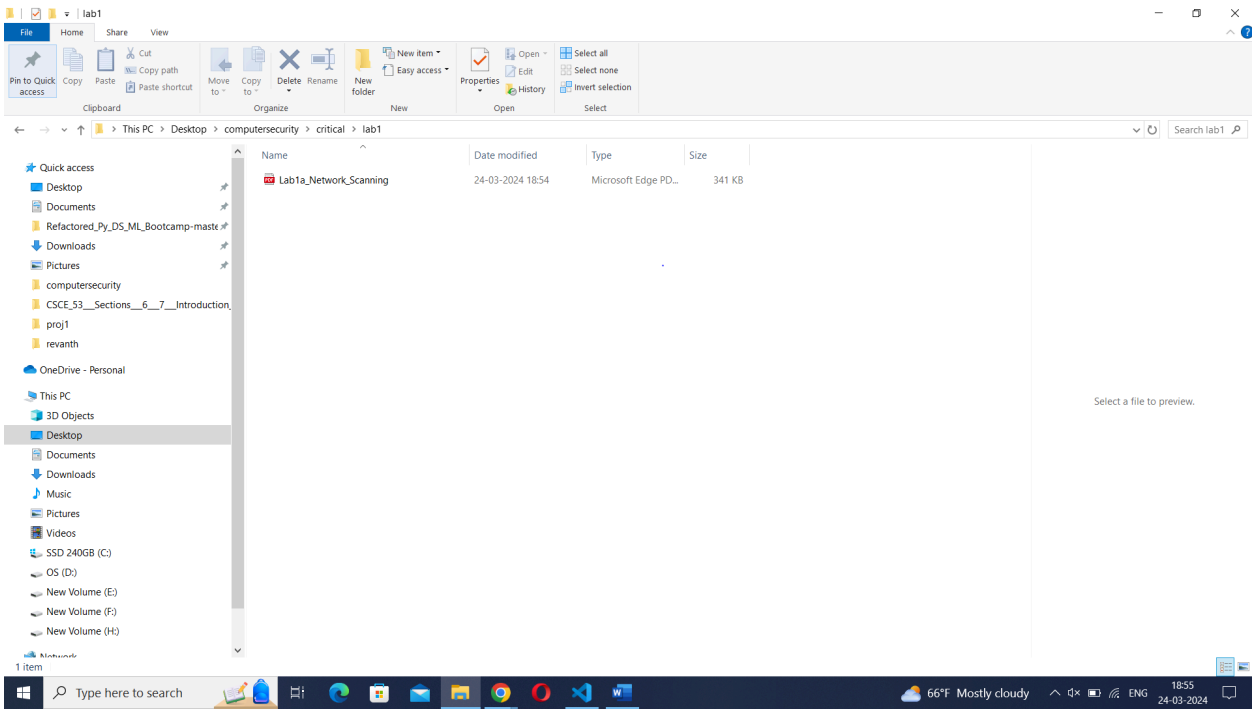
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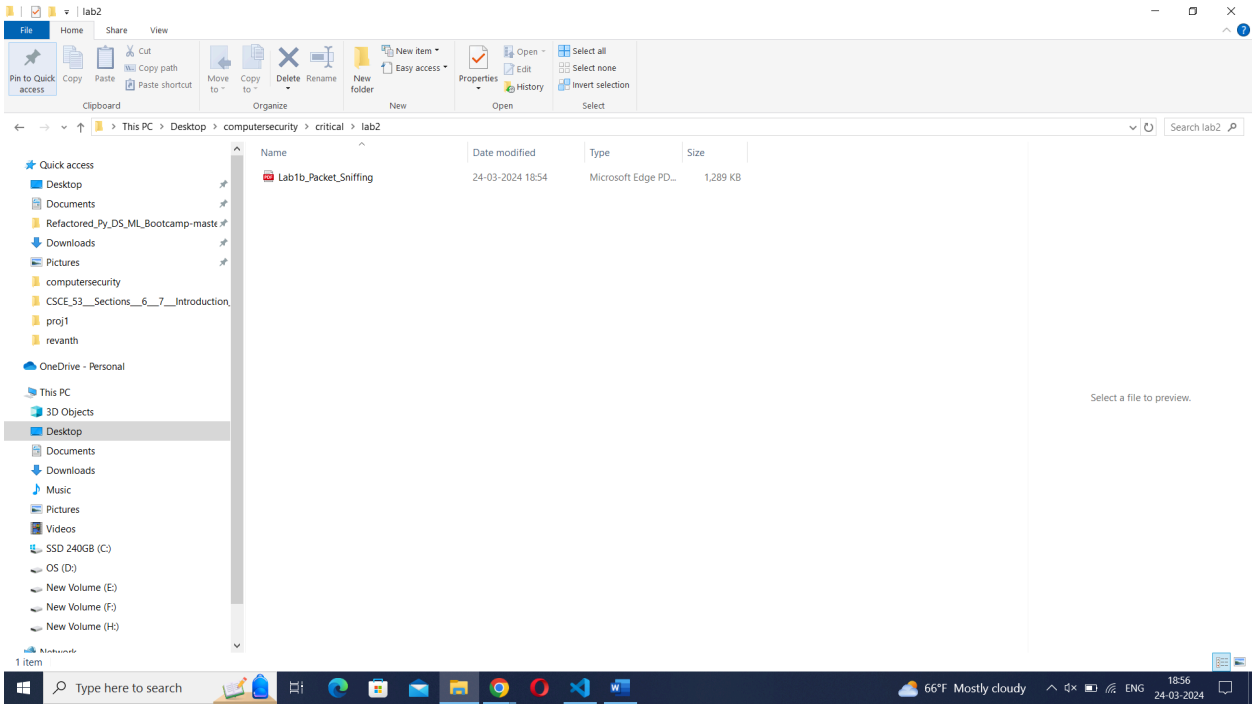
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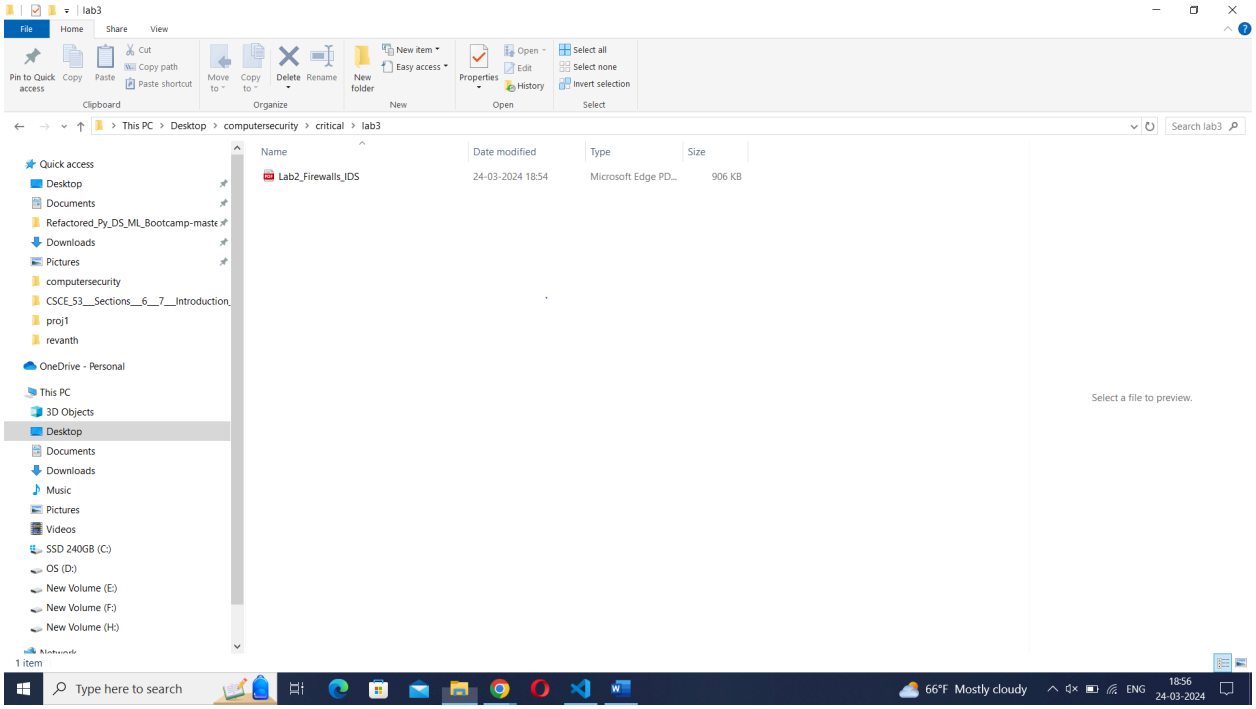
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