ASSIGNMENT 4

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Problem ID	Captured Flag	Steps
P1	flag{3V1L_817_3xf1l7R4710N_4_7H3_W1N_51D43c8000034d0c}	Open the pcap file in Wireshark. Apply a filter to display only packets with the reserved bit set to 0. Examine each filtered packet and record the last character from each packet, as it represents part of the flag.
P2	flag{74573_Y0u_c4N_533}	Open the file in Wireshark. Apply a filter to display traffic with the specified source and destination IP addresses. Locate and extract the 6th stream. Use CyberChef to decode the contents and obtain an image. Convert the image from hexadecimal format to retrieve the flag.
P3	flag{9ebd4718347e389aaa2a3241624a 15}	Mount the disk image. List all hidden files. Locate the .docx file and open it in CyberChef. Extract all contents from the .docx file. Utilize the image containing a QR code and input the extracted text into CyberChef. Decode the text from base64 and hexadecimal to obtain the flag.
P4		

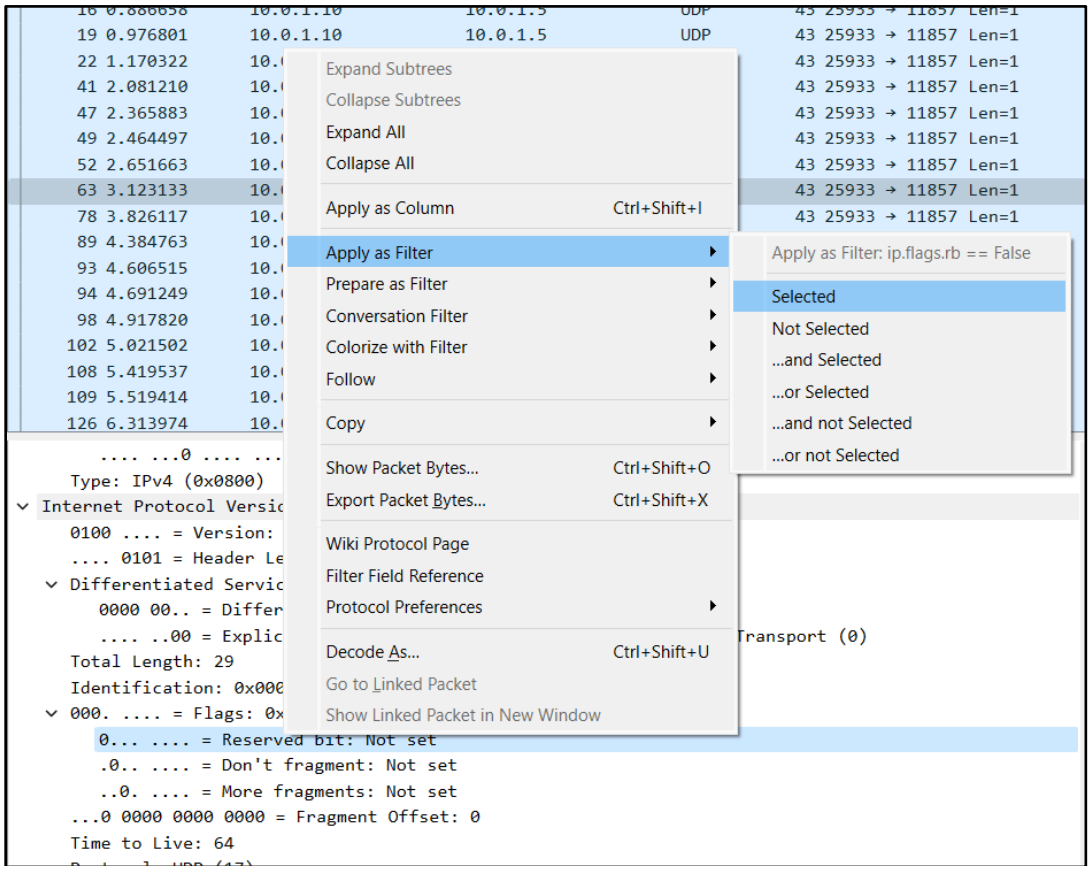
Detailed Explanations (Including Screenshots)

Q1.

1. Open the pcap file in Wireshark.
2. Apply a filter to display only packets with the reserved bit set to 0.
3. Examine each filtered packet and record the last character from each packet, as it represents part of the flag.
4. After loading the PCAP file into Wireshark, I examined several packets and identified a distinct pattern in the reserve bit for a specific set of packets.
5. I discovered that certain packets had their reserve bit set to zero, while others had different values. Using Wireshark's filter option, I isolated packets with the reserve bit set to zero.
6. Once filtered, I observed that the last byte in the hexadecimal dump indicated a flag.

7. By systematically analyzing each filtered packet and recording the last characters, I compiled the following sequence of characters on my notepad.

```
        .... ...0 .... .... .... .... = IG bit: Individual address (unicast)
    Type: IPv4 (0x0800)
v Internet Protocol Version 4, Src: 10.0.1.10, Dst: 10.0.1.5
    0100 .... = Version: 4
    .... 0101 = Header Length: 20 bytes (5)
  v Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
      0000 00.. = Differentiated Services Codepoint: Default (0)
      .... ..00 = Explicit Congestion Notification: Not ECN-Capable Transport (0)
    Total Length: 29
    Identification: 0x0001 (1)
  v 000. .... = Flags: 0x0
      0... .... = Reserved bit: Not set
      .0.. .... = Don't fragment: Not set
      ..0. .... = More fragments: Not set
    ...0 0000 0000 0000 = Fragment Offset: 0
    Time to Live: 64
    Protocol: UDP (17)
```



Q2.

1. Open the file in Wireshark.
2. Apply a filter to display traffic with the specified source and destination IP addresses.
3. Locate and extract the 6th stream.
4. Use CyberChef to decode the contents and obtain an image.
5. Convert the image from hexadecimal format to retrieve the flag.

I analyzed the file in Wireshark to examine the generated packets, particularly focusing on those originating from 173.194.29.9 and destined for 192.168.1.111, which appeared to be repeated multiple times and part of internal traffic.

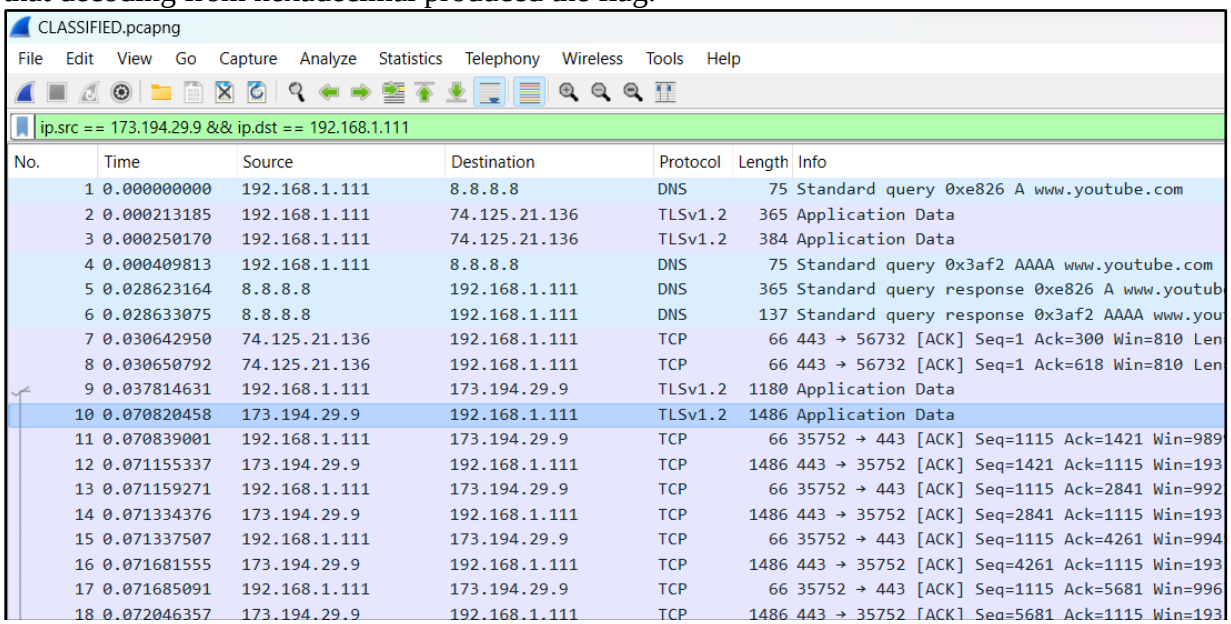
By applying a filter to isolate packets with the specified source and destination addresses, I refined my analysis to focus solely on relevant packets.

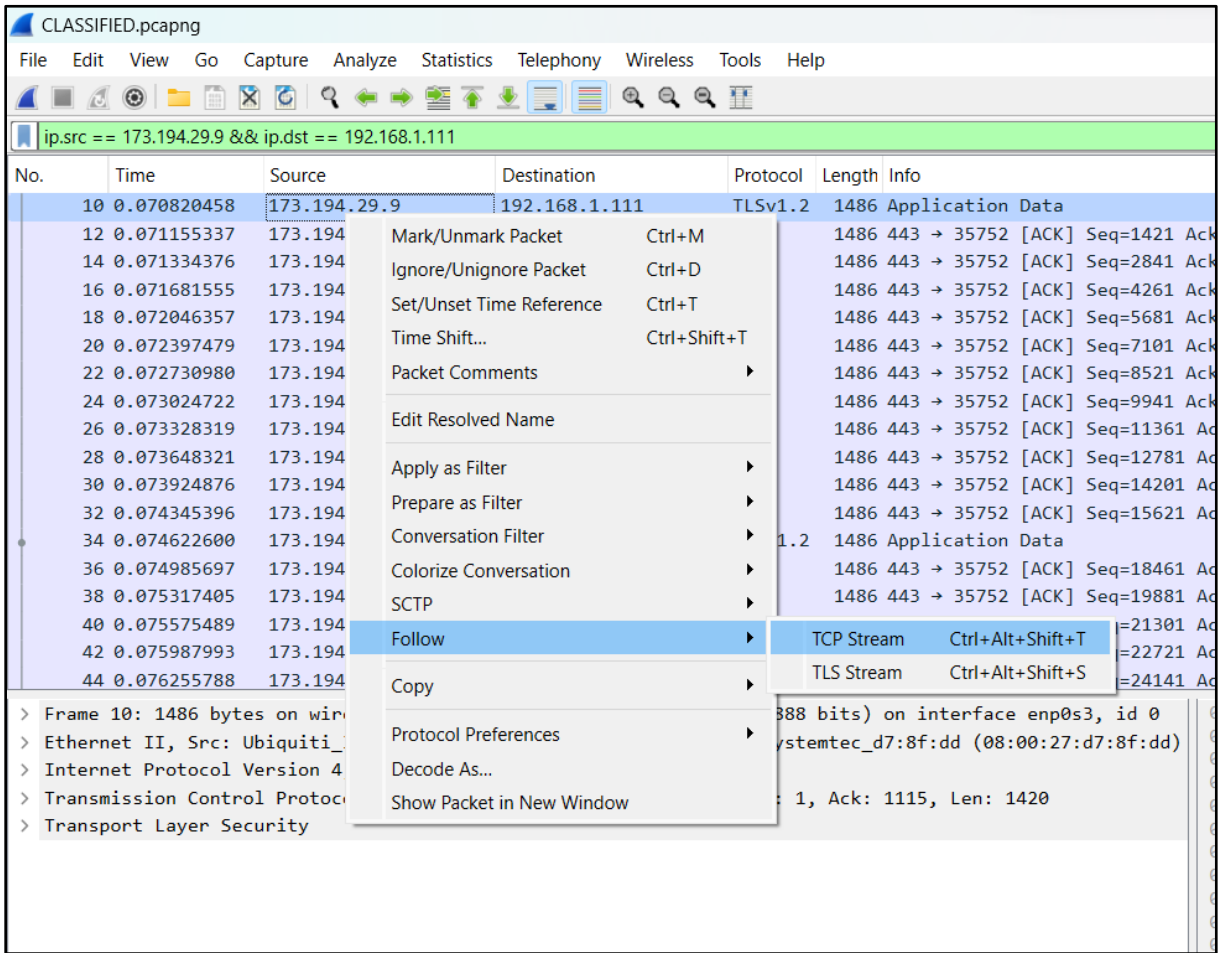
Upon inspecting the packet streams, I identified the sixth stream as containing substantial content. Notably, at the end of this packet's content, there was a string ending with an equals sign, indicative of a base64 representation.

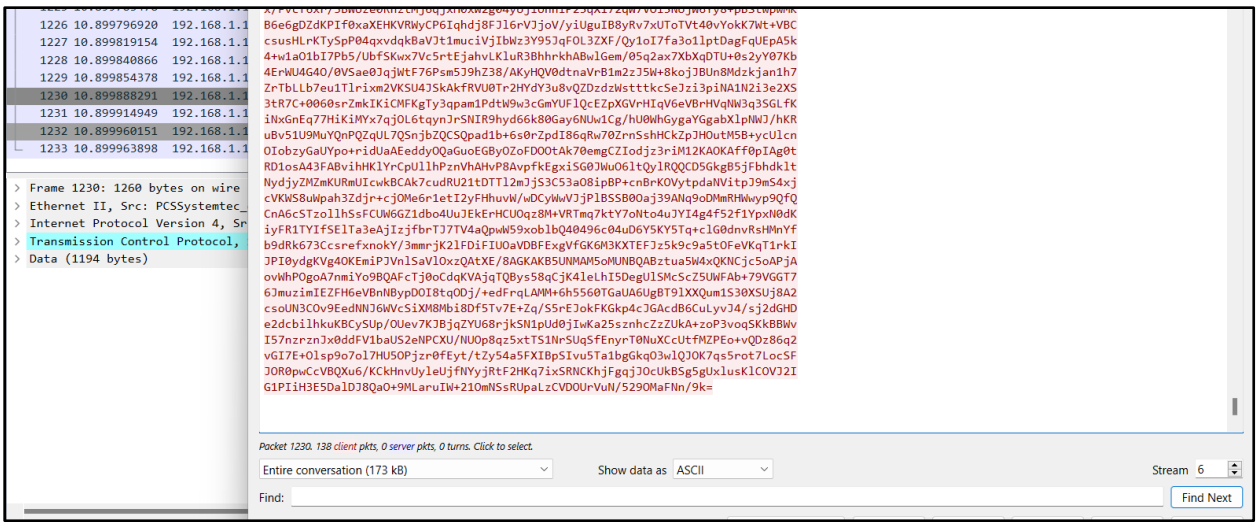
Using CyberChef, I decoded the base64-encoded string and discovered the presence of a JFIF file signature, signaling an image file. Consequently, I utilized text-to-image translation to obtain the image.

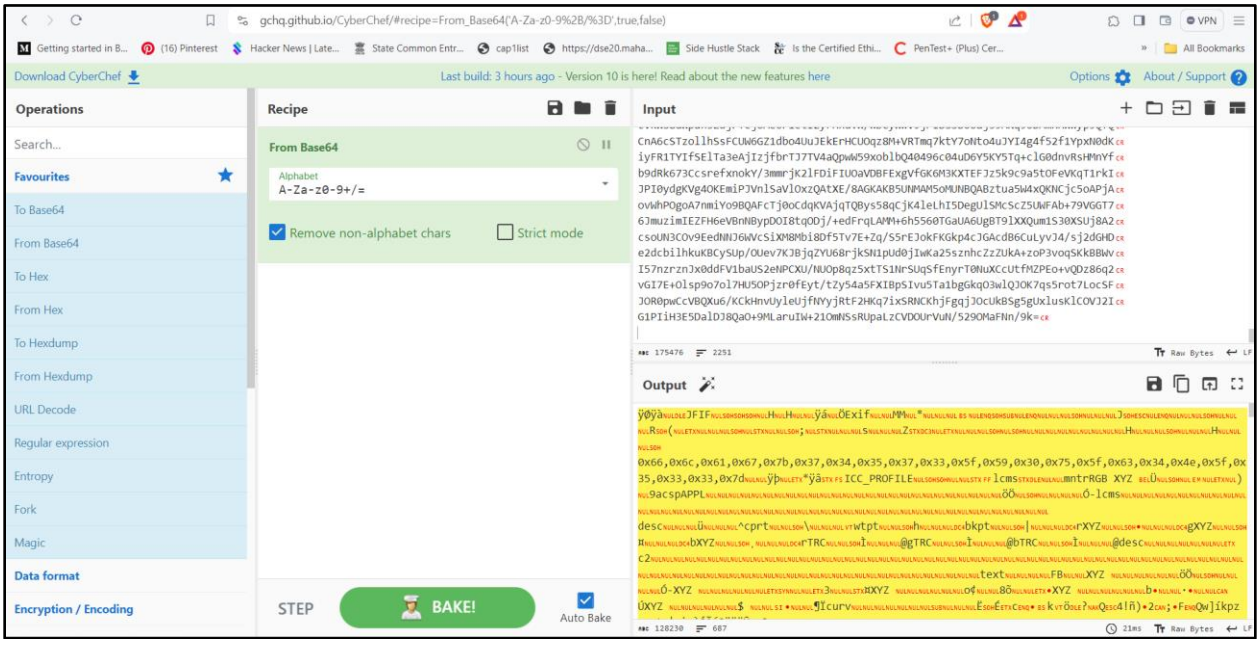
Despite considerable efforts to decode the image using techniques like steganography, no meaningful information was revealed. However, further experimentation in CyberChef revealed

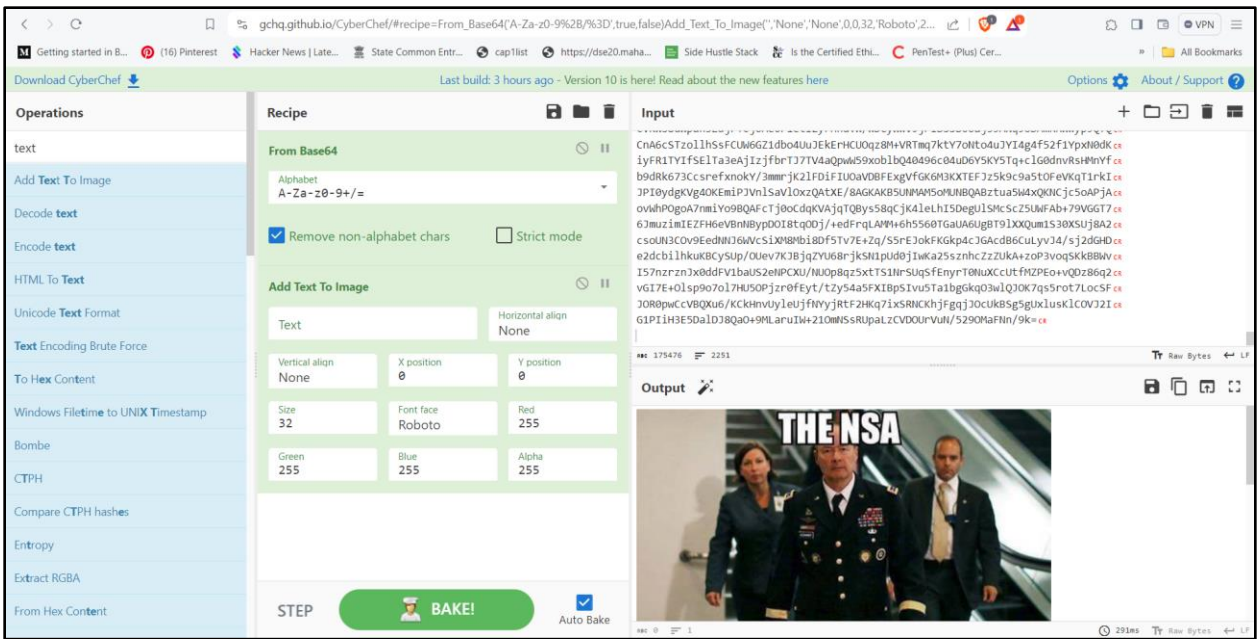
that decoding from hexadecimal produced the flag.

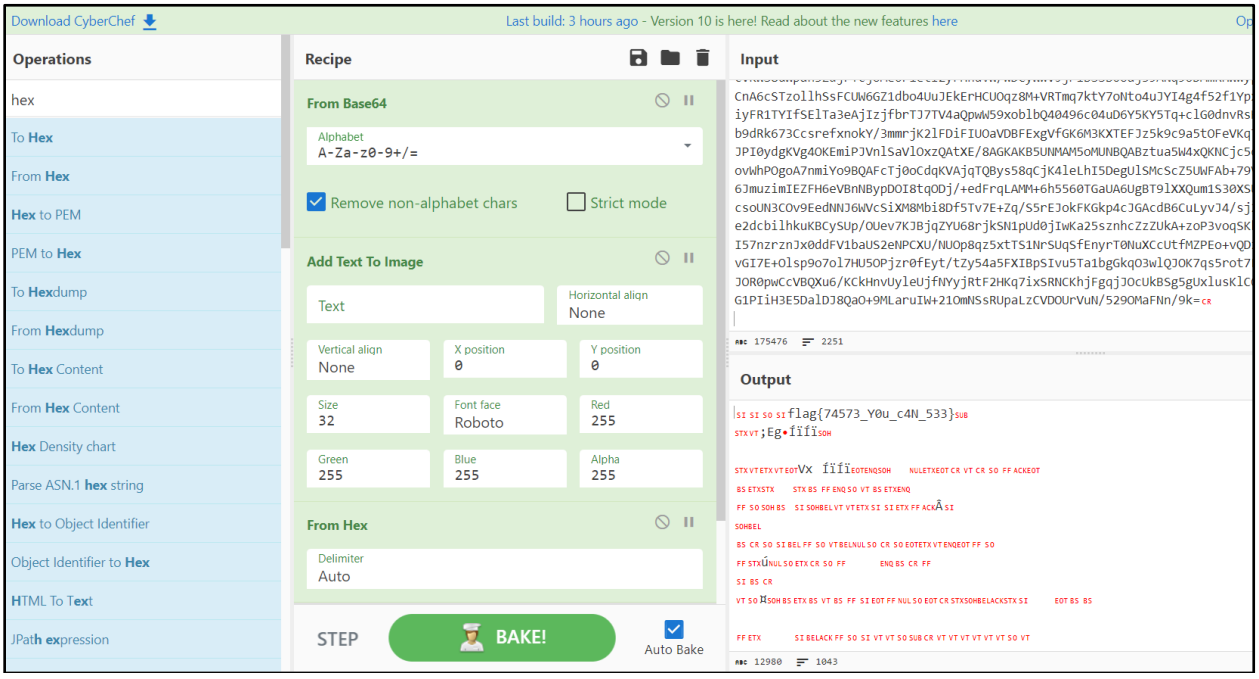





1226 10.899796920 192.168.1.1
1227 10.899819154 192.168.1.1
1228 10.899840866 192.168.1.1
1229 10.899854378 192.168.1.1
1230 10.899888291 192.168.1.1
1231 10.899914949 192.168.1.1
1232 10.899960151 192.168.1.1
1233 10.899963898 192.168.1.1
Frame 1230: 1260 bytes on wire
Ethernet II, Src: PCSSystemtec_
Internet Protocol Version 4, Sr
Transmission Control Protocol,
Data (1194 bytes)
Packet 1230. 138 client pkts, 0 server pkts, 0 turns. Click to select.
Entire conversation (173 kB)
Show data as ASCII
Stream 6
Find:
Find Next


gchq.github.io/CyberChef/#recipe=From_Base64('A-Za-z0-9%2B/%3D',true,false)
Download CyberChef
Last build: 3 hours ago - Version 10 is here! Read about the new features here
Options
About / Support
Operations
Search...
Favourites
To Base64
From Base64
To Hex
From Hex
To Hexdump
From Hexdump
URL Decode
Regular expression
Entropy
Fork
Magic
Data format
Encryption / Encoding
Recipe
From Base64
Alphabet
A-Za-z0-9+/=
Remove non-alphabet chars
Strict mode
Input
Output
STEP
BAKE!
Auto Bake





Q3.

1. Mount the disk image.
2. List all hidden files.
3. Locate the .docx file and open it in CyberChef.
4. Extract all contents from the .docx file.
5. Utilize the image containing a QR code and input the extracted text into CyberChef.
6. Decode the text from base64 and hexadecimal to obtain the flag.
7. Question 3:

I mounted the file and ran the ls command to list all the files present in the folder. Since the contents were not visible, I ran the command with the -a option to print all the hidden files.

```
┌──(kali㉿purva)-[/media/kali/E3E8-4B401]
└─$ ls

┌──(kali㉿purva)-[/media/kali/E3E8-4B401]
└─$ ls -la
total 12
drwxr-xr-x  3 kali kali 4096 Dec 31  1969 .
drwxr-x---+ 4 root root 4096 Feb 21 21:25 ..
drwxr-xr-x  4 kali kali 4096 Feb  4  2018 .Trash-1000
```

I entered the Trash-1000 folder. Here, I was able to find two directories named files and info:

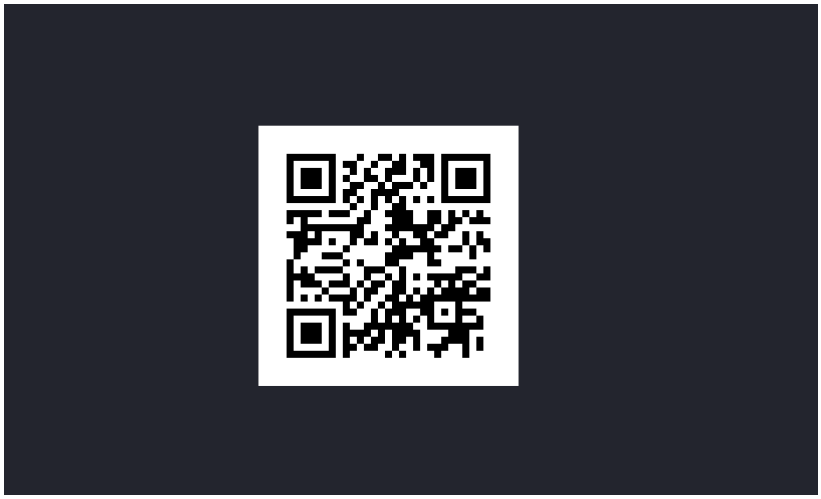
```
┌──(kali㉿purva)-[/media/kali/E3E8-4B401/.Trash-1000]
└─$ ls
files  info
```

Within the files folder, I found a document file name flag, hinting that this file relates to the flag:

```
┌──(kali㉿purva)-[/media/kali/E3E8-4B401/.Trash-1000]
└─$ cd files

┌──(kali㉿purva)-[/media/kali/E3E8-4B401/.Trash-1000/files]
└─$ ls
Flag.docx
```

I opened the file in cyberchef and had to unzip it to reveal the contents. Within, I found a QR image. I got a piece of text when I scanned this code.



I was able to extract the flag by converting from base 64: