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OSCTF 2024 - Forensic

OSCTF Writeup Command and Control Powershell Blue Team

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All solved forensic challenges_

Hi guys, this time I joined HITCON CTF with my team: World Wide Union, but because of no forensic challenges, I had to go here and try to solve some challenges. Now it's my writeup for them, let's go!

The Lost Image Mystery

They gave us a corrupted image and we need to recover it. I used **xxd** to check hex values inside:

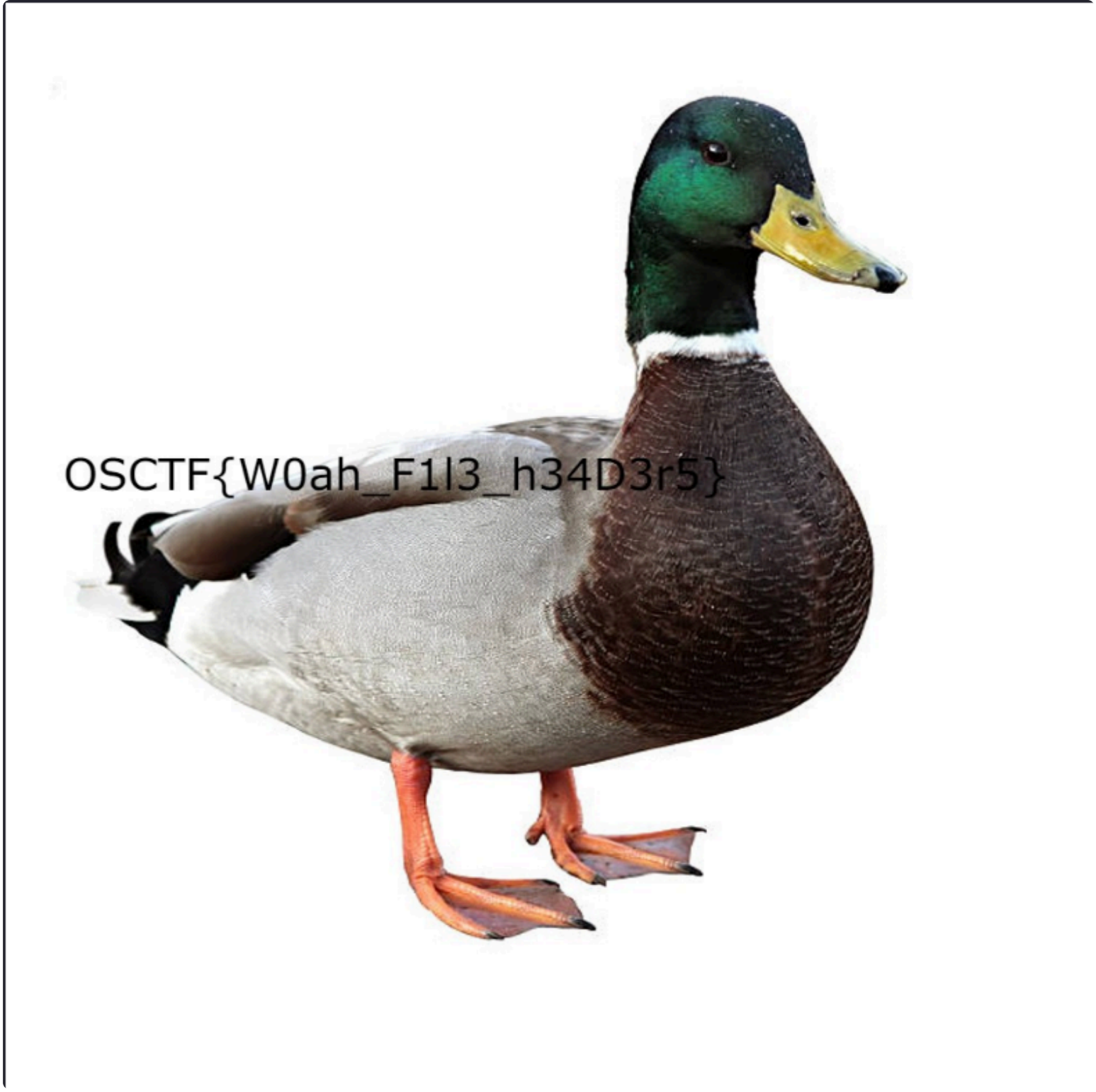
```
┌──(odin㉿DFIR)-[~/Downloads]
└─$ xxd image.png | head -n 10
00000000: d8e0 0049 4600 0101 0000 0100 0100 00ff   ...IF...........
00000010: e201 d849 4343 5f50 524f 4649 4c45 0001   ...ICC_PROFILE..
00000020: 0100 0001 c800 0000 0004 3000 006d 6e74   ..........0..mnt
00000030: 7252 4742 2058 595a 2007 e000 0100 0100  rRGB XYZ .......
00000040: 0000 0000 0061 6373 7000 0000 0000 0000   .....acsp.......
00000050: 0000 0000 0000 0000 0000 0000 0000 0000   ................
00000060: 0000 0000 0100 00f6 d600 0100 0000 00d3   ................
00000070: 2d00 0000 0000 0000 0000 0000 0000 0000   -...............
00000080: 0000 0000 0000 0000 0000 0000 0000 0000   ................
00000090: 0000 0000 0000 0000 0000 0000 0000 0000   ................

┌──(odin㉿DFIR)-[~/Downloads]
└─$
```

You can guess easily it must be JPG or JPEG file because of ...IF. From here you can use this list to check the signature for the file:

FF D8 FF DB	ÿØÿÛ	0	jpg jpeg	JPEG raw or in the JFIF or Exif file format[16]
FF D8 FF E0 00 10 4A 46 49 46 00 01	ÿØÿà NULDLE JFIF NULSOH			
FF D8 FF EE	ÿØÿî			
FF D8 FF E1 ?? ?? 45 78 69 66 00 00	ÿØÿá??Exif NULNUL			

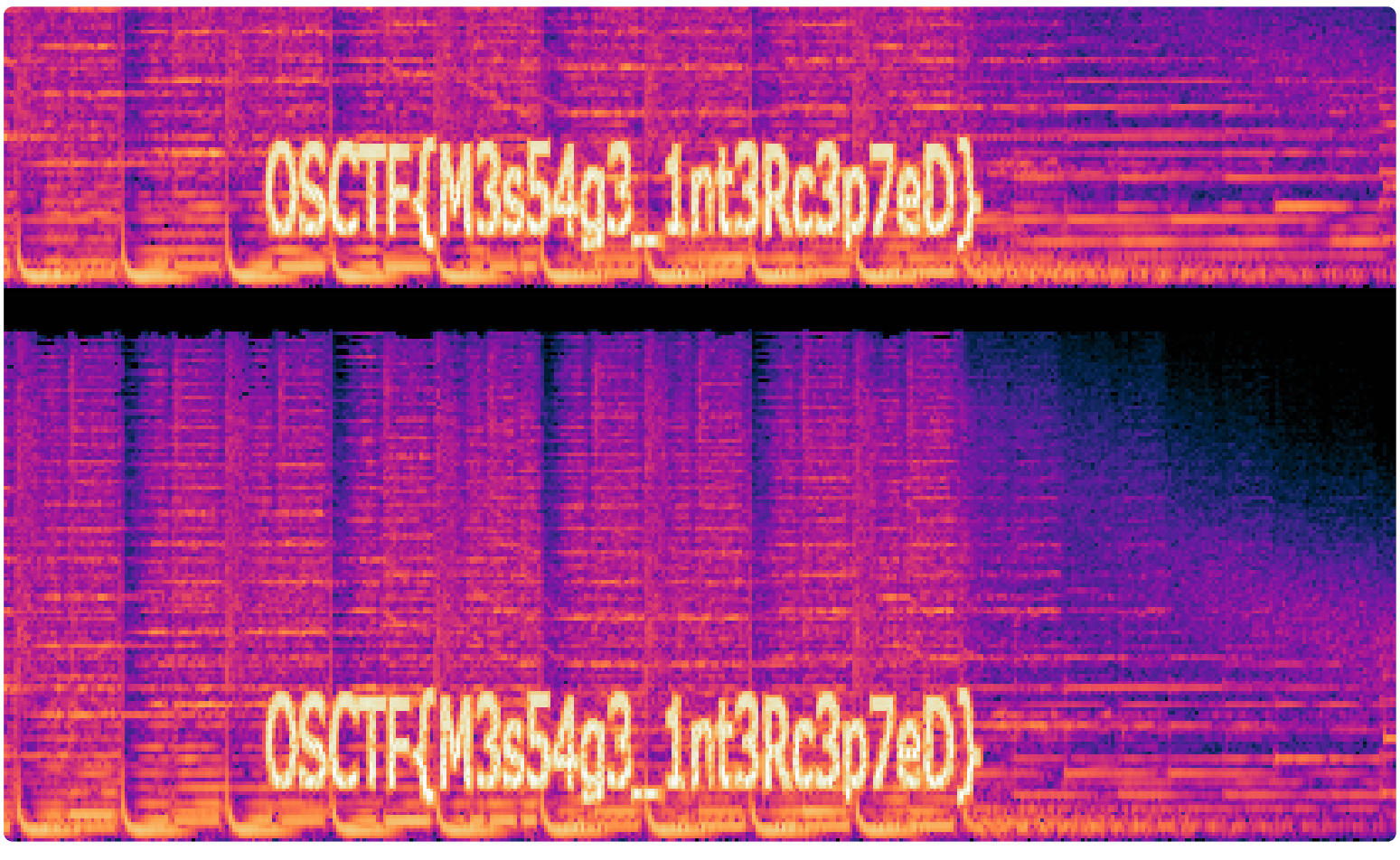
Use **hexedit** to edit hex value, open the file again and enjoy your result:



Flag: OSCTF{W0ah_F1l3_h34D3r5}

The Hidden Soundwave

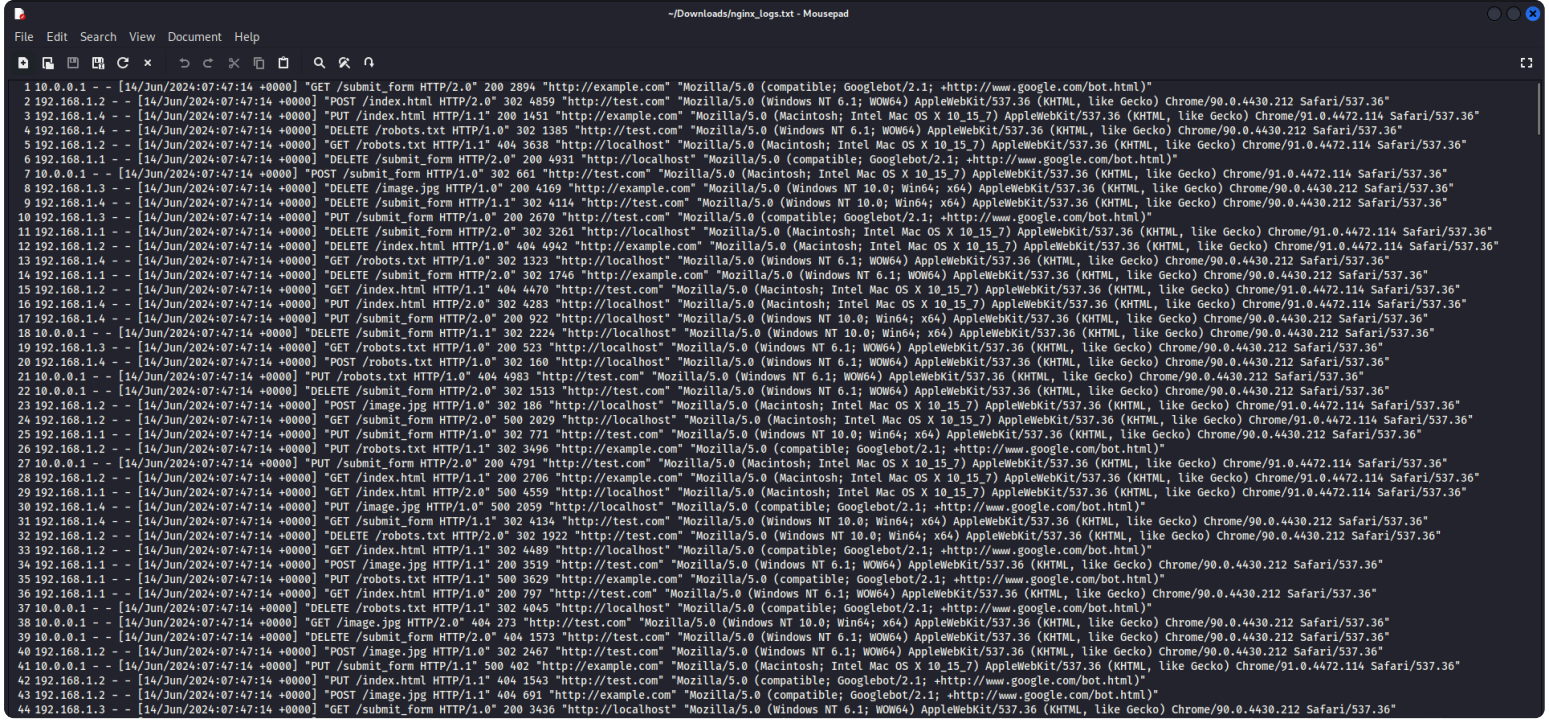
We got an audio file, and as the title, you need to find hidden information inside the audio file. Very basic, I always check spectrogram because it appeared in many CTFs 😂 😂 😂. From here I used audacity to open audio file, change to spectrogram view and I got the flag:



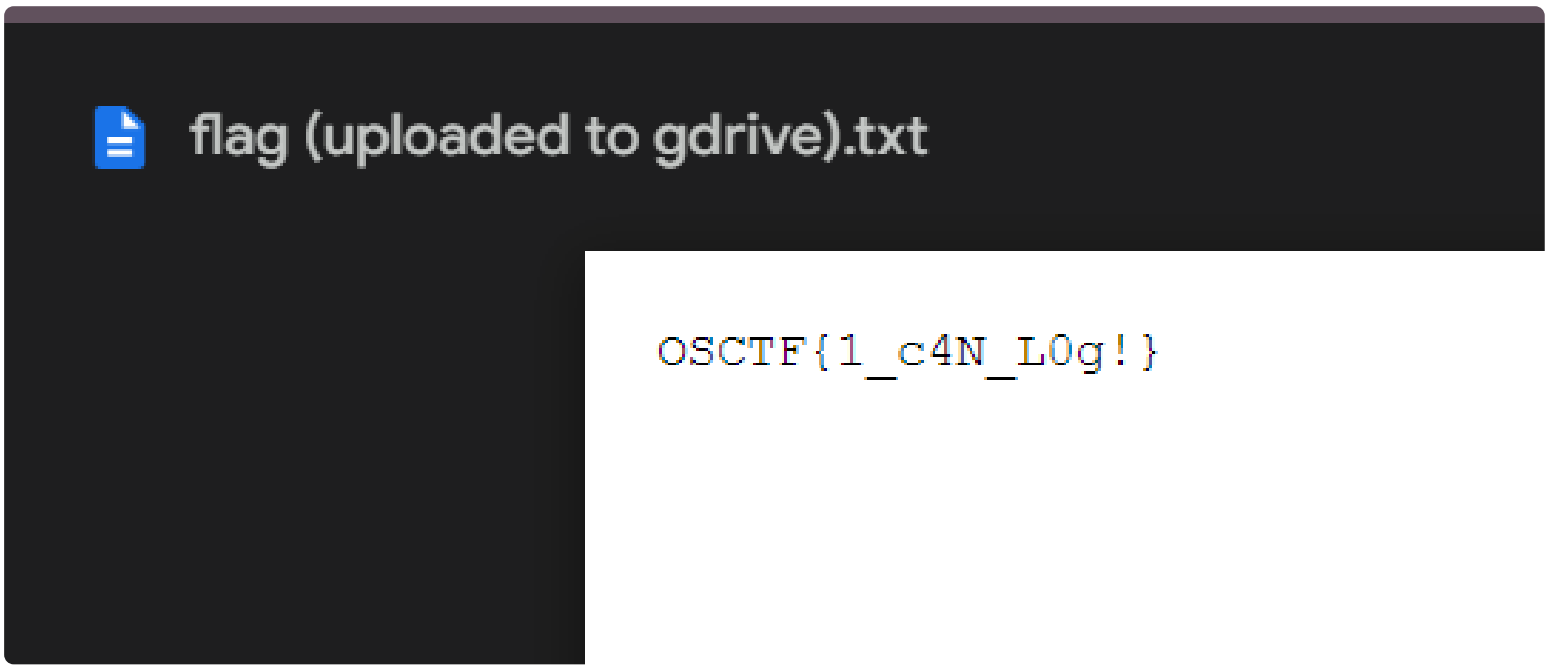
Flag: OSCTF{M3s54g3_1nt3Rc3p7eD}

Mysterious Website Incident

Now we had a nginx log, and very simple, we just open in text editor and analyse it:



After searching, I found a GG drive link, open it and I got the flag:



Flag: OSCTF{1_c4N_L0g!}

Phantom Script Intrusion

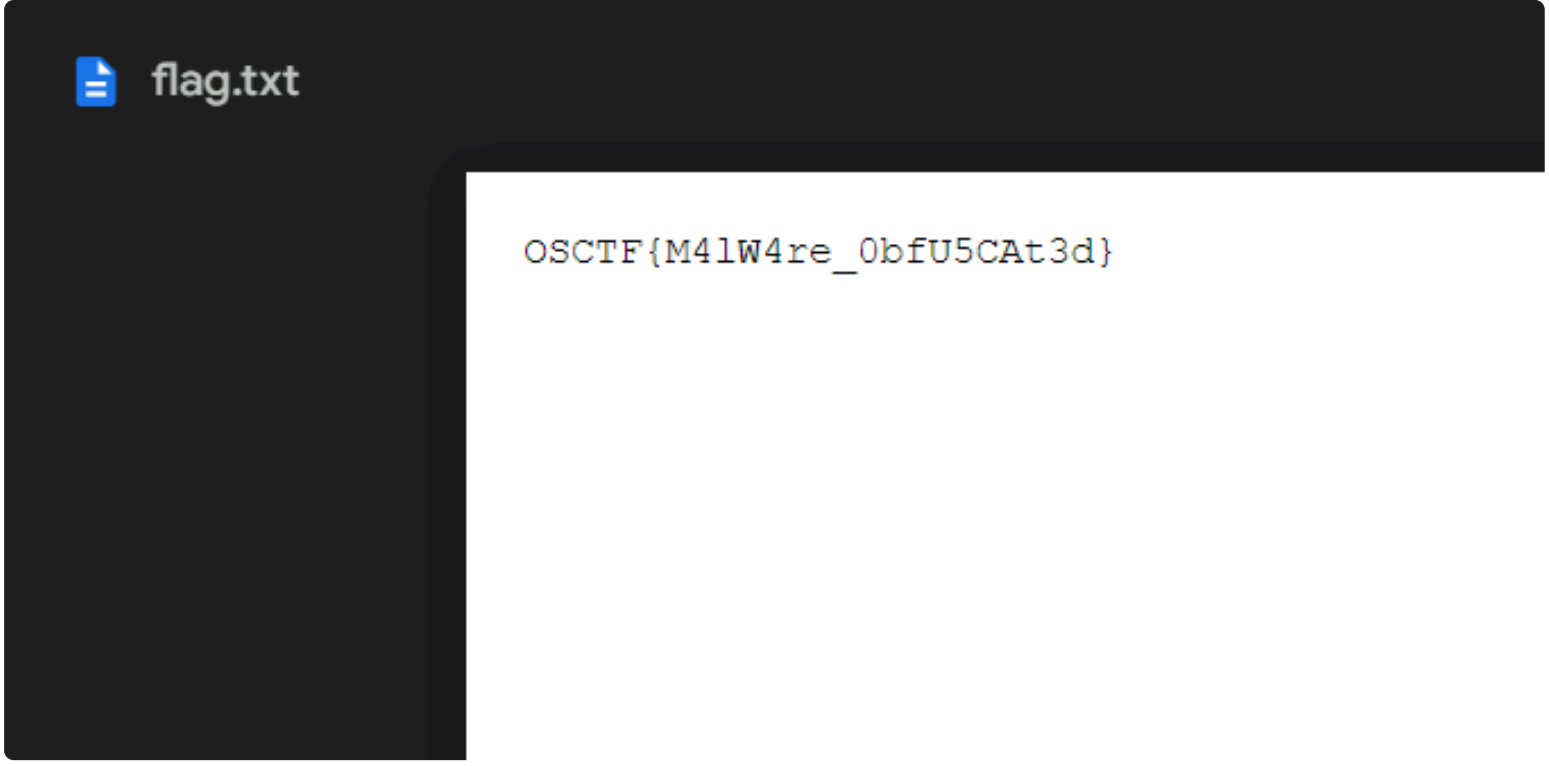
For this challenge, they gave us a PHP code, and it was obfucated:

```
<?php
 goto Ls6vZ; apeWK: ${"\x76\141\x72\61"} = str_rot13("\x24\x7b\x22\134\x78\x34\x37\134\x78\x34\143\x5c\x78\64\x66\x5c\170\x34\x32\134\x78\64\61\x5c\170\x34\x63\134\x78\x35\x33\x42\x7d"); goto G9fZX; Ls6vZ: ${"\x47\x4c\x4f\x42\101\114\123"} = "\150\x58\x58\x70\x73\72\x2f\57\163\150\x30\162\164\x75\x72\x6c\56\x61\164\x2f\x73\x31\146\x57\62"; goto apeWK; XT2kv: if (strlen(${"\x76\141\x72\x32"}) >= 0) { ${"\166\x61\x72\x33"} = ${"\x76\x61\x72\x32"}; } else { ${"\166\141\x72\63"} = ''; } goto ZYamk; V2P3O: foreach (str_split(${"\166\141\x72\x33"}) as ${"\166\x61\x72\x35"}) { ${"\166\141\162\x34"} .= chr(ord(${"\166\141\162\65"}) - 1); } goto Ly_yq; G9fZX: ${"\x76\141\162\x32"} = base64_decode(${${"\166\x61\162\x31"}}); goto XT2kv; Ly_yq: eval(${${"\x76\x61\x72\x34"}}); goto IFMxz; ZYamk: ${"\166\141\162\64"} = ''; goto V2P3O; IFMxz: ?>
```

To make it easier to follow, I deobfucated it and this is my final script:

```
${"GLOBALS"} = "hXXps://sh0rturl.at/s1fW2";
${"var1"} = str_rot13("${\"\\x47\\x4c\\x4f\\x42\\x41\\x4c\\x53\"}");
${"var2"} = base64_decode(${${"var1"}});
if (strlen(${"var2"}) > 0) {
    ${"var3"} = ${"var2"};
} else {
    ${"var3"} = "";
}
${"var4"} = "";
foreach (str_split(${"var3"}) as ${"var5"}) {
    ${"var4"} .= chr(ord(${"var5"}) - 1);
}
eval(${${"var4"}});
```

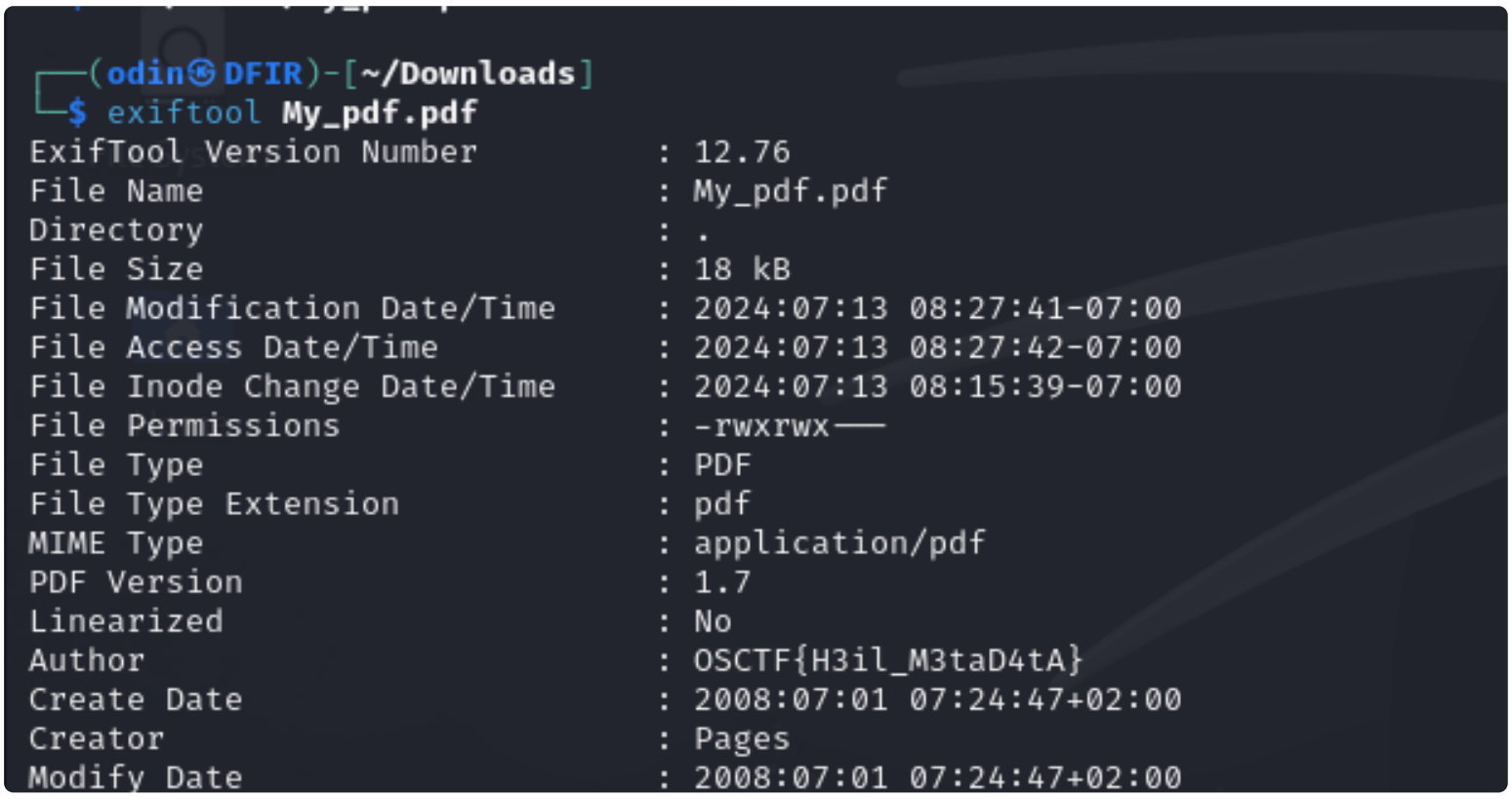
There's a shorturl link, access it and got the flag:



Flag: OSCTF{M4lW4re_0bfU5CAt3d}

PDF Puzzle

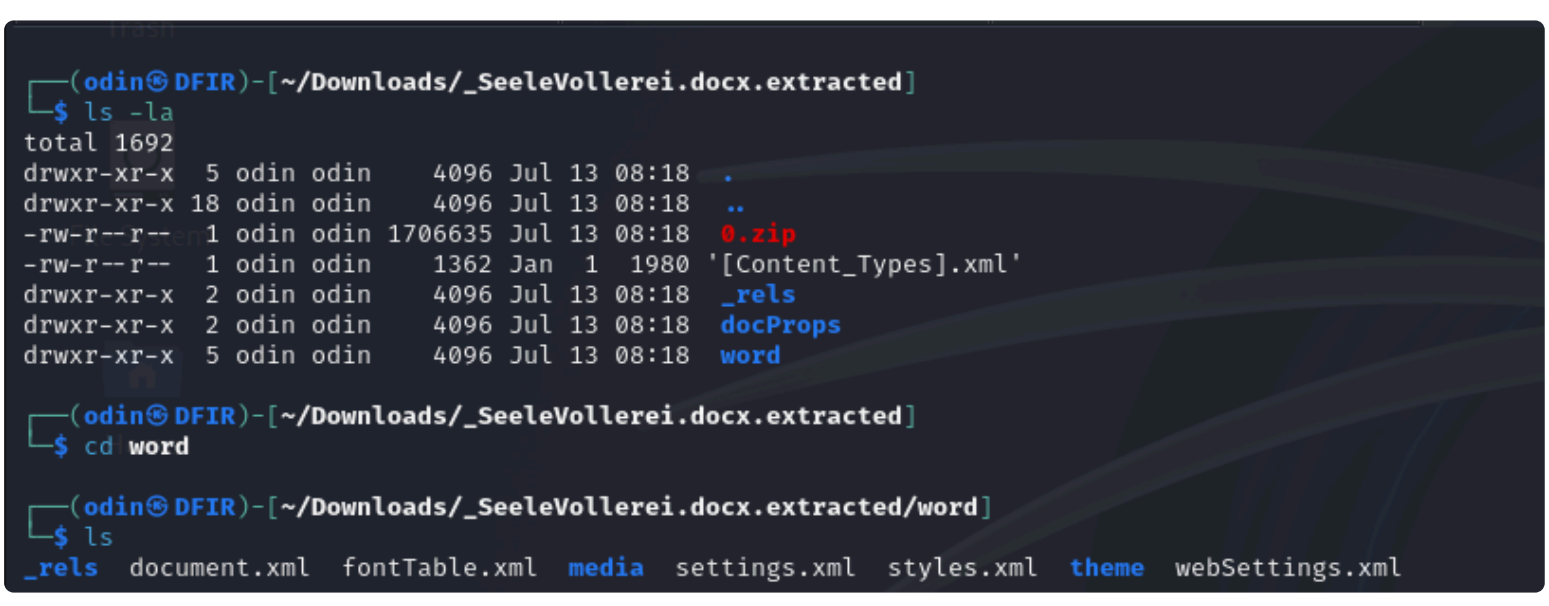
Just check the metadata of the file => get the flag:



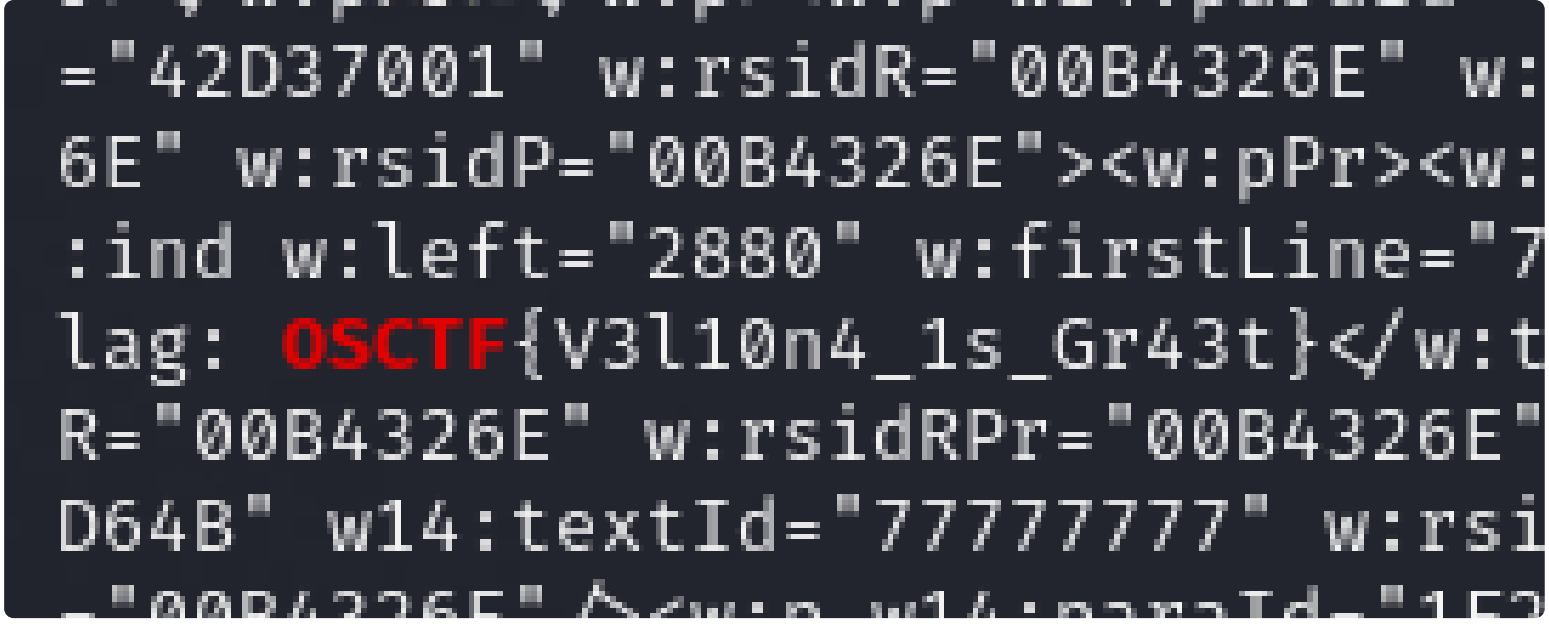
Flag: OSCTF{H3il_M3taD4tA}

Seele Vellorei

In this challenge we had a docx file. At first I tried to find out VBA code inside, but there's nothing, so I think maybe flag was hidden somewhere inside the file. Because word structure is same with zip file, you can use **binwalk** to extract all files inside:



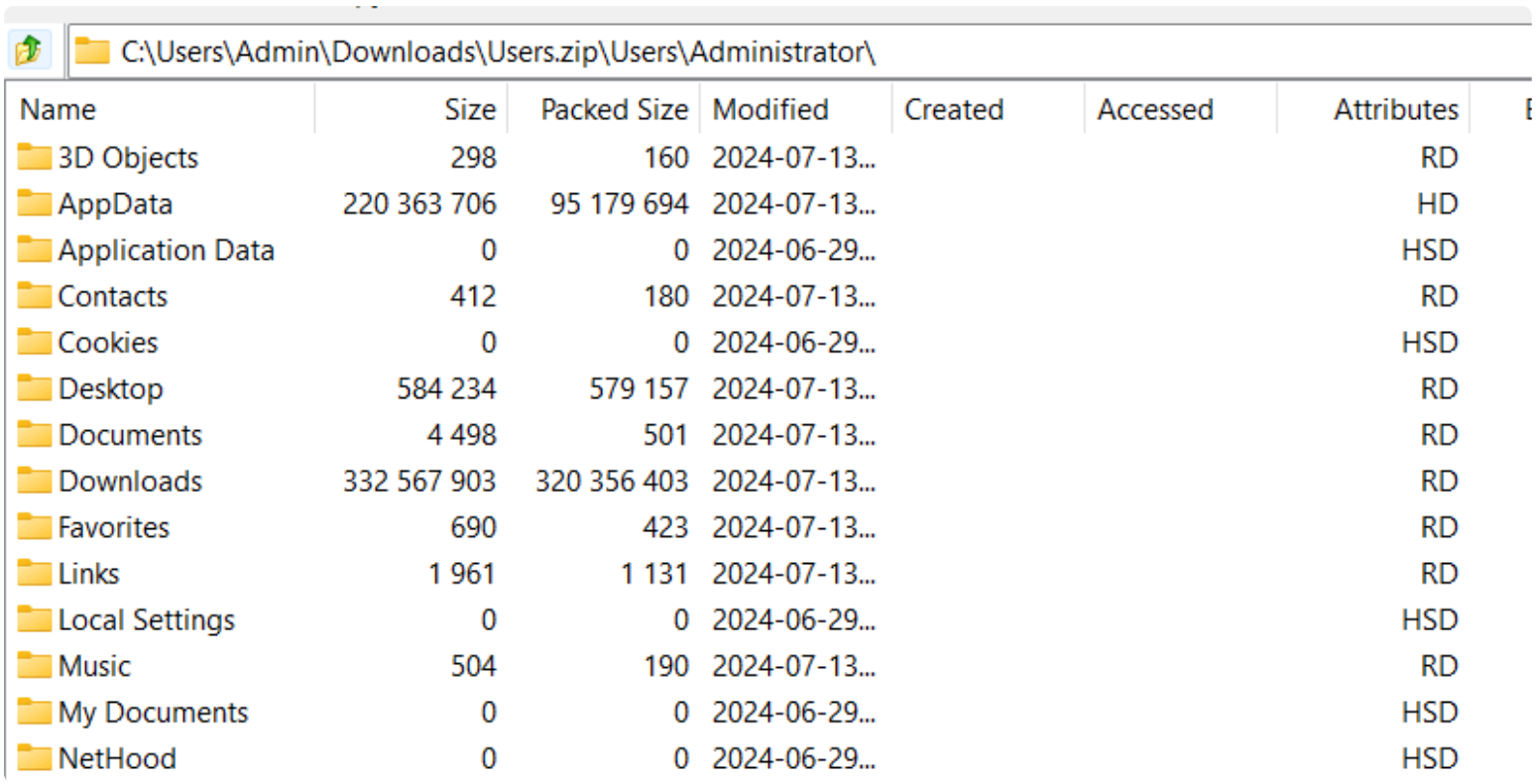
Navigate to **document.xml** where content of file was stored, use **grep** and I found the flag:



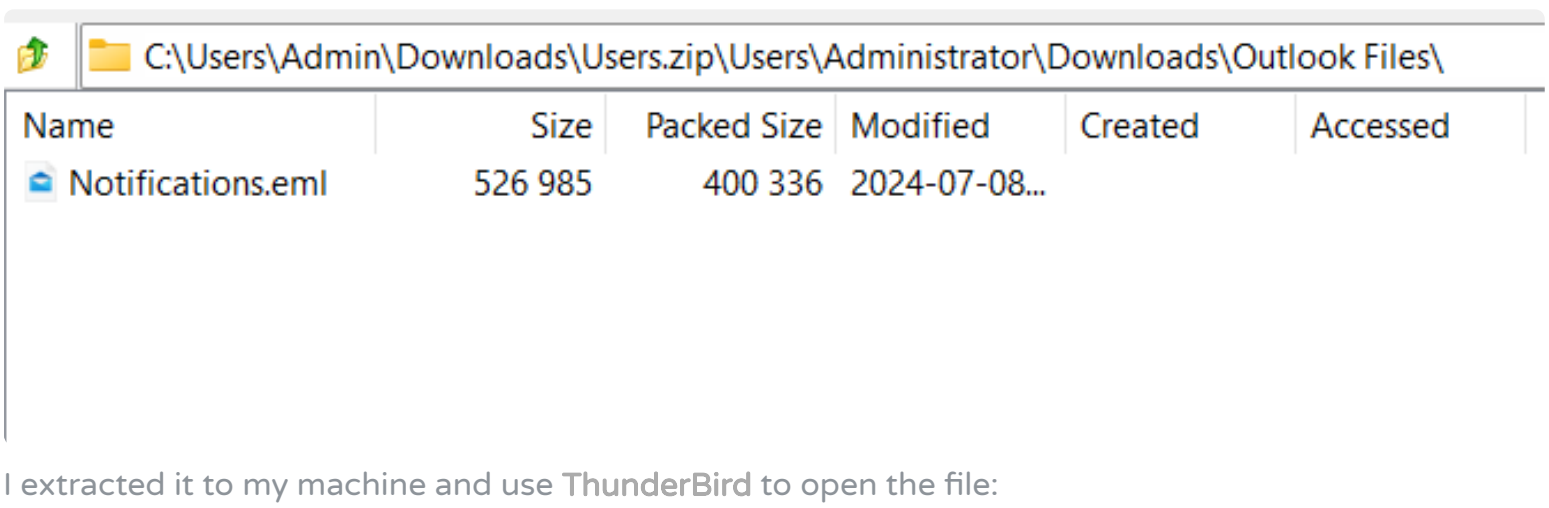
Flag: OSCTF{V3l10n4_1s_Gr43t}

FOR101

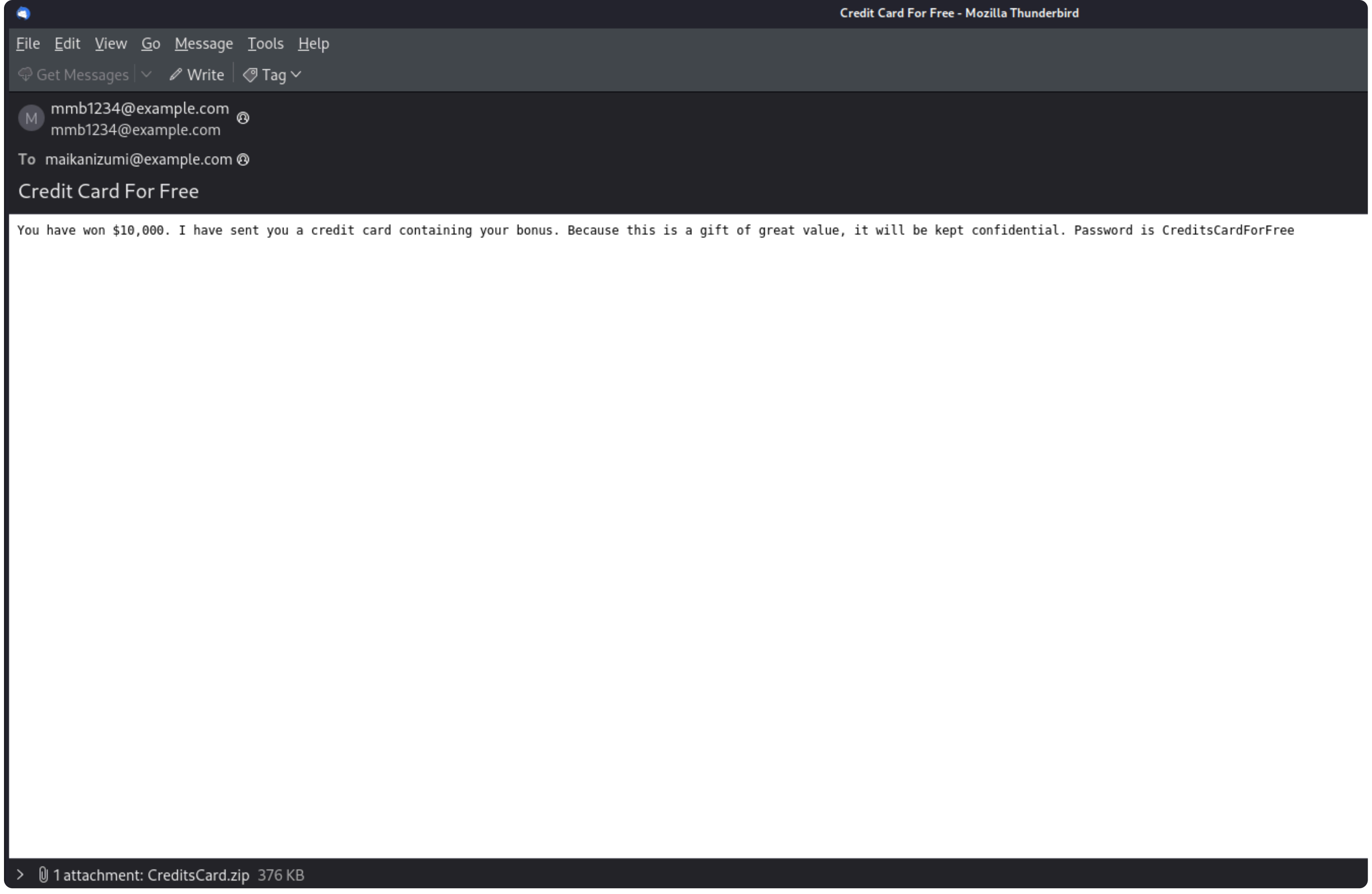
I love this challenge most, so I will explain it carefully. In this challenge we had a zip file contains datas inside an User directory. I opened it by 7z:



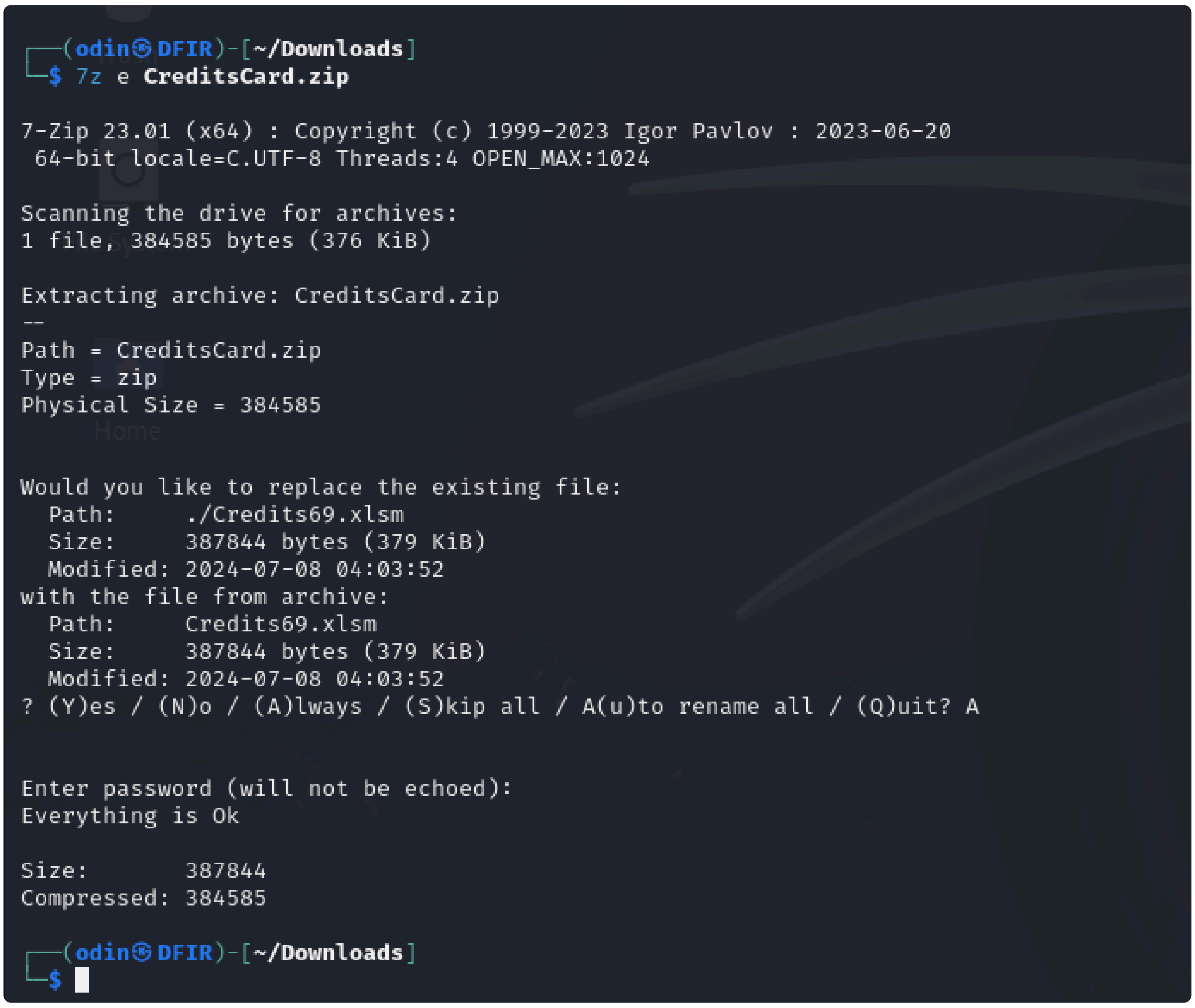
After searching, I found an .eml file at \Users\Administrator\Downloads\Outlook Files named Notifications.eml:



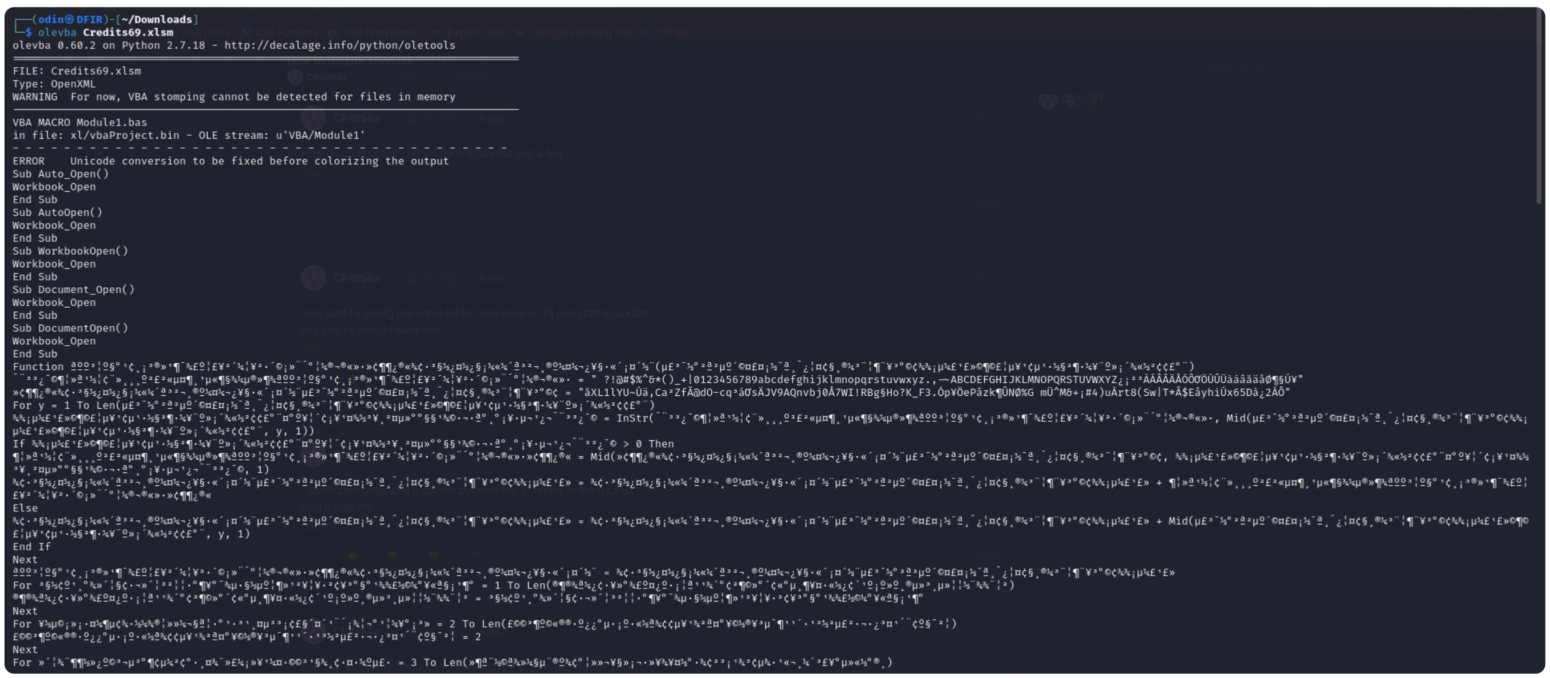
I extracted it to my machine and use ThunderBird to open the file:



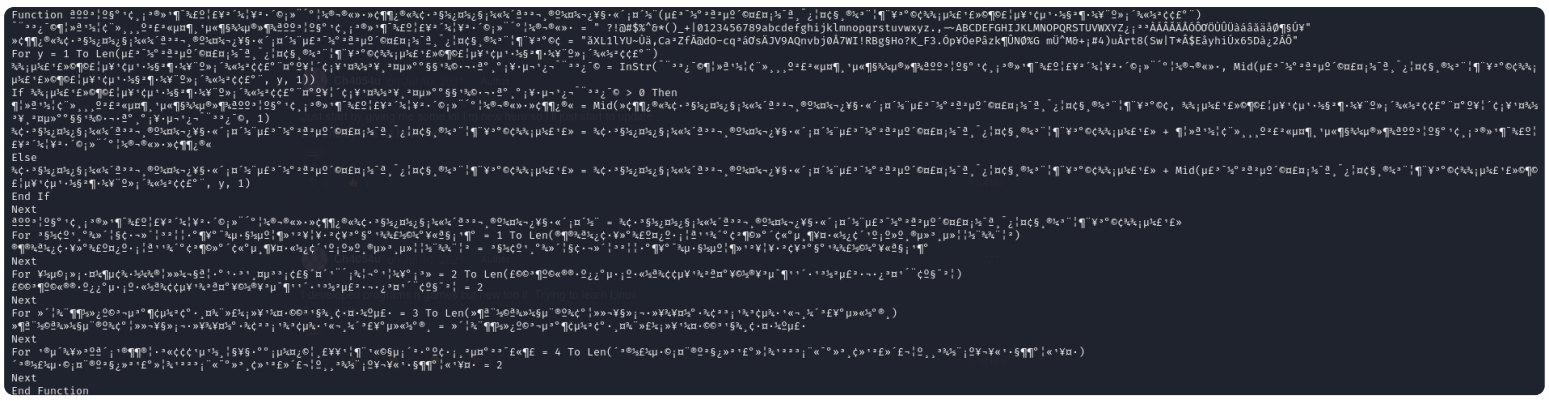
You can see that there's a zip file and the password is CreditsCardForFree. Now let's open this file and see what inside:



There's a xlsm file, and as usual, I always check VBA code inside by using olevba:

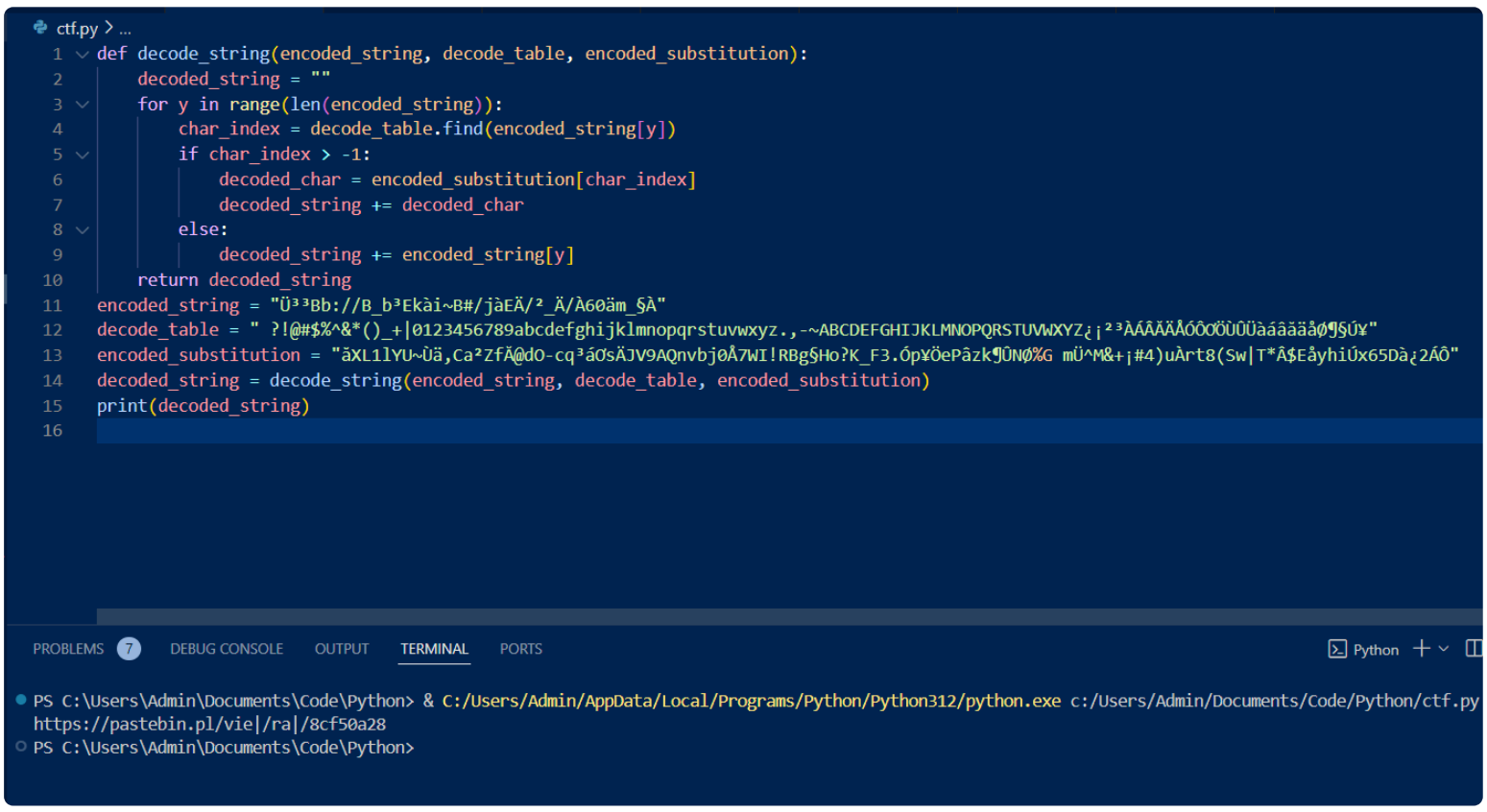


You can see that there's a VBA code and it's obfucated, and we don't any choice except deobfucate it by your hand or you can read code by Ctrl+F+the_name_of_func. After this I found that function will process a string looks like URL:



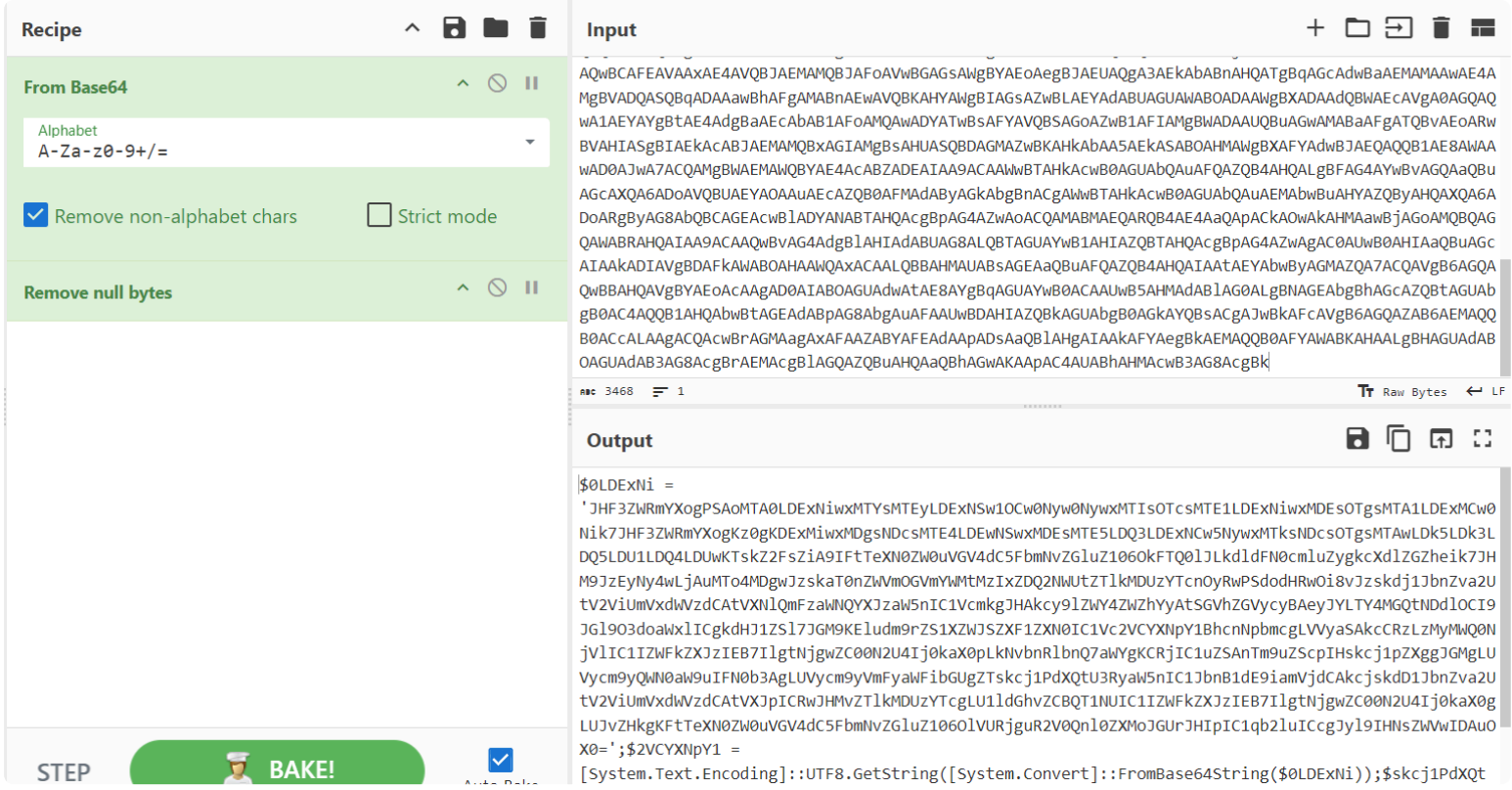
From here I can realise that our function are trying to decode that string. Based on their function, I rewrote a Python script for automatic decoding:

```
def decode_string(encoded_string, decode_table, encoded_substitution):
    decoded_string = ""
    for y in range(len(encoded_string)):
        char_index = decode_table.find(encoded_string[y])
        if char_index > -1:
            decoded_char = encoded_substitution[char_index]
            decoded_string += decoded_char
        else:
            decoded_string += encoded_string[y]
    return decoded_string
encoded_string = "Ü³³Bb://B_b³Ekài~B#/jàEÄ/²_Ä/À60äm_§À"
decode_table = " ?!@#$%^&*()_+|0123456789abcdefghijklmnopqrstuvwxyz.,-~ABCDEFGHIJKLMNOPQRSTU
encoded_substitution = "ăXL1lYU~Ùä,Ca²ZfĂ@dO-cq³áƠsÄJV9AQnvbj0Å7WI!RBg§Ho?K_F3.Óp¥ÖePâzk¶ÛNØ
decoded_string = decode_string(encoded_string, decode_table, encoded_substitution)
print(decoded_string)
```

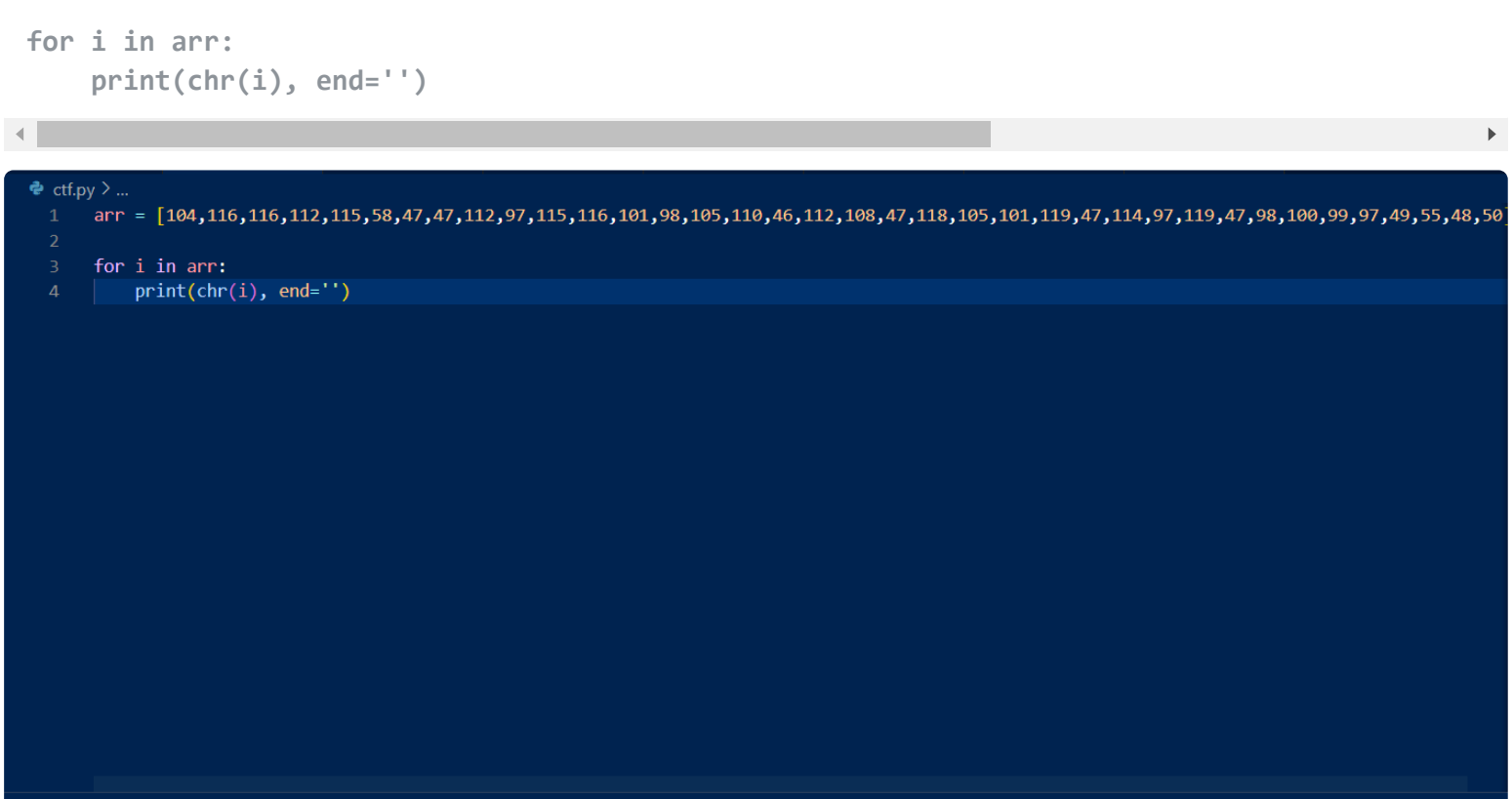


I got a link, now let's open it and see what inside:

You can see that there's a Powershell script and it will execute a command that was encoded by base64. Now we continue to decode base64 string:



There's a base64 string again. I decoded it and got one more script:

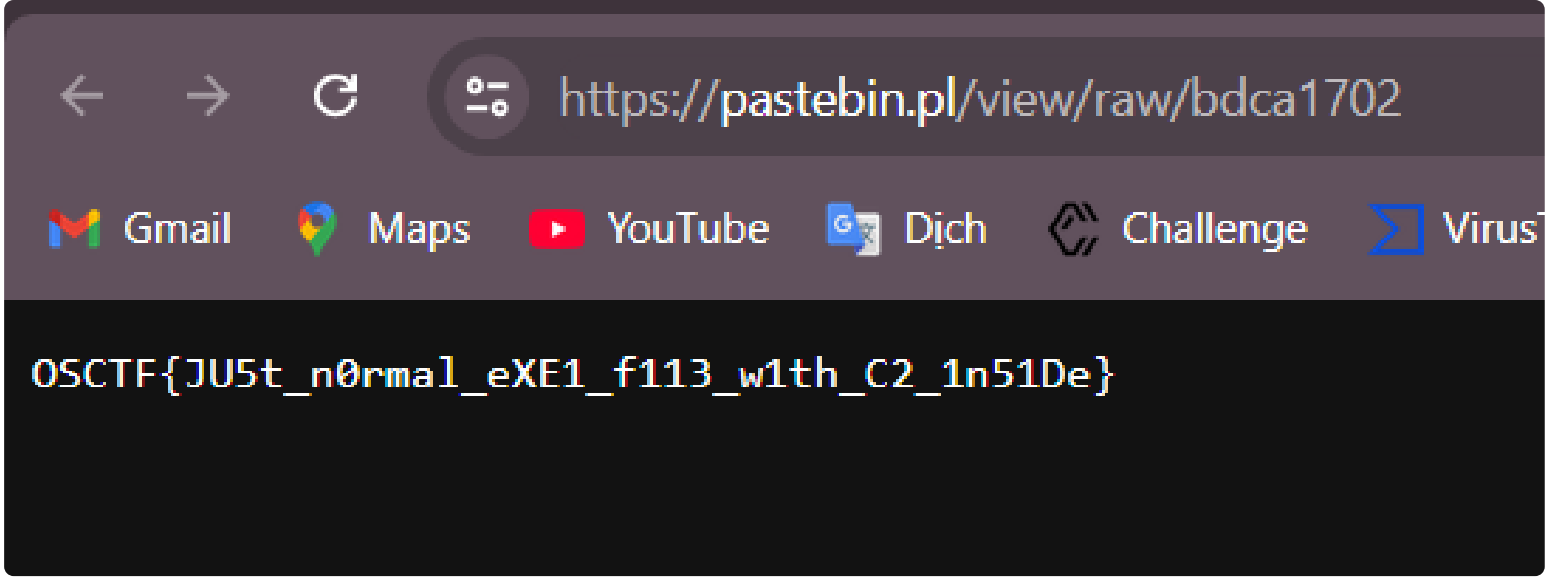


In $galf variable, it will take each elements in $qwedfaz and decode it to ascii character. From here I wrote a Python script again:

```
arr = [104,116,116,112,115,58,47,47,112,97,115,116,101,98,105,110,46,112,108,47,118,105,101,

for i in arr:
    print(chr(i), end='')
```


I got a link again, opened it and I got the flag:



Flag: OSCTF{JU5t_n0rmal_eXE1_f113_w1th_C2_1n51De}

Thank you for watching, hope you enjoy this. I solved other challenges but I still love forensic so I just wrote writeup for it 😂😂😂. See you in other CTFs, bye!!!

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