

# Pico CTF Report

(Forster Boateng)

18.7.2023

## 1 Introduction

Write short introduction here.

The picoCTF report is part of the Introduction to Information Security Course exercises. This report tells how the picoCTF challenges were solved and with supporting screen shots. The solve challenges can be found in the link below:

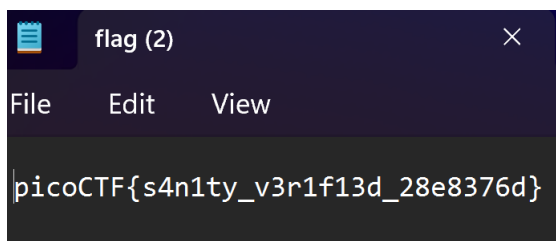
<https://play.picoctf.org/practice?page=1>

## 2 Solved challenges /

### 2.1 Name of solved challenge here / Obedient Cat

Write here shortly how you solved the challenge. It was straight forward, downloaded the code and the flag was easy to find.

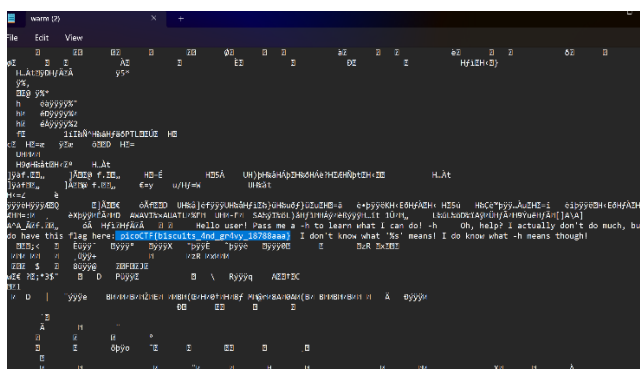
Place supportive screenshots regarding the problem-solving process here.



### 2.2 Name of solved challenge here /wave a flag

Write here shortly how you solved the challenge. Downloaded the file and carefully searched the flag.

Place supportive screenshots regarding the problem-solving process here.



### 2.3 Name of solved challenge here. Transformation

Write here shortly how you solved the challenge. Looked for the flag in via google search.

Place supportive screenshots regarding the problem-solving process here.

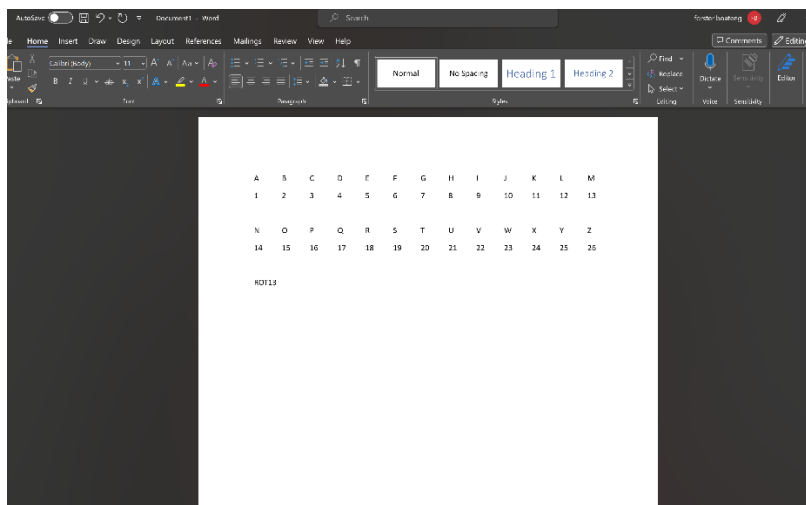
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```
Python
1 enc = '髙捌宏観の形穉瘠瘠瘠の瘠瘠瘠瘠瘠瘠瘠'
2 flag = ''
3
4 for i in range(len(enc)):
5     flag += chr(ord(enc[i]) >> 8)
6     flag += chr(ord(enc[i]) - (ord(flag[-1]) << 8))
7
8 print(flag)
9 # output: picoCTF{16_bits_inst34d_of_8_26684c20}
```

## 2.4 Name of solved challenge here /ROT13

Write here shortly how you solved the challenge. Solved it manually using the alphabet.

Place supportive screenshots regarding the problem-solving process here.



## 2.5 Name of solved challenge here /Mod 26

Write here shortly how you solved the challenge. Mod 26 was solved using the Rot 13 table.

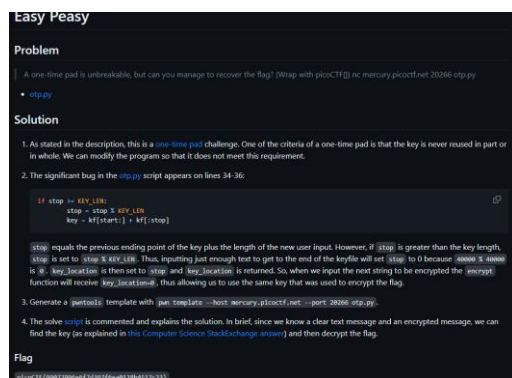
Place supportive screenshots regarding the problem-solving process here.

The screenshot shows the Microsoft Word interface. The ribbon is set to the 'Home' tab, with the 'Font' group selected. The document content is a table of letters and numbers.

A	S	C	D	E	F	G	H	I	J	K	L	M
1	2	3	4	5	6	7	8	9	10	11	12	13
N	O	P	Q	R	S	T	U	V	W	X	Y	Z
14	15	16	17	18	19	20	21	22	23	24	25	26

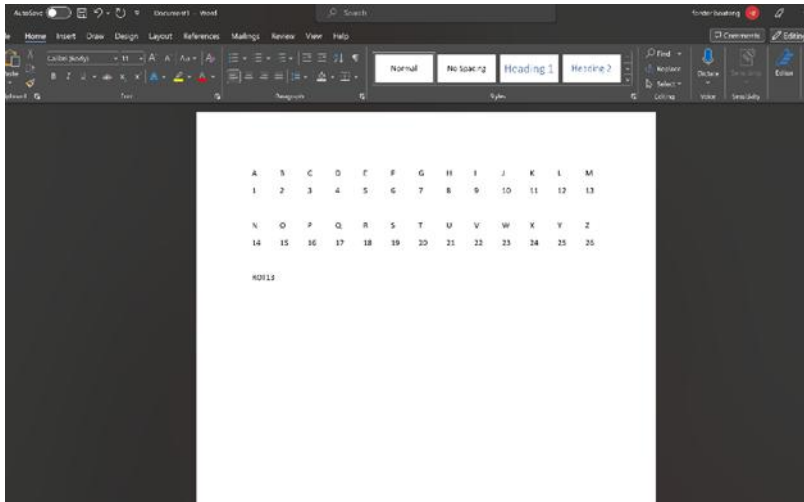
Below the table, the text 'K0115' is visible.

Place supportive screenshots regarding the problem-solving process here.



Place supportive screenshots regarding the problem-solving process here

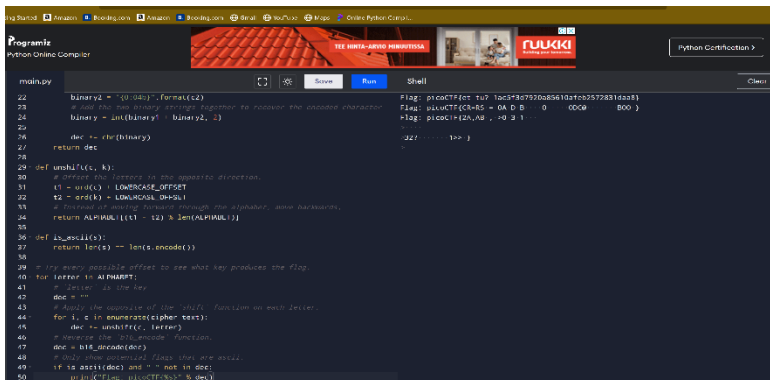
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2.8 Name of solved challenge here / New caesar

Write here shortly how you solved the challenge. I used python to generate the flag.

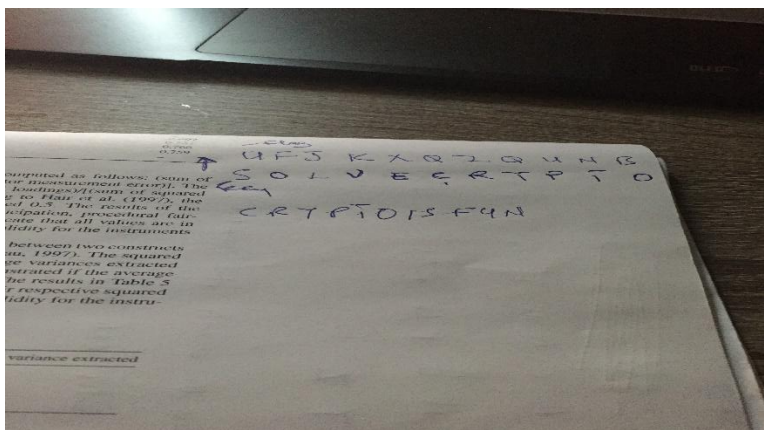
Place supportive screenshots regarding the problem-solving process here.



2.9 Name of solved challenge here / Easy 1

Write here shortly how you solved the challenge. Used the Vigenère's table to solve it manually.

Place supportive screenshots regarding the problem-solving process here.

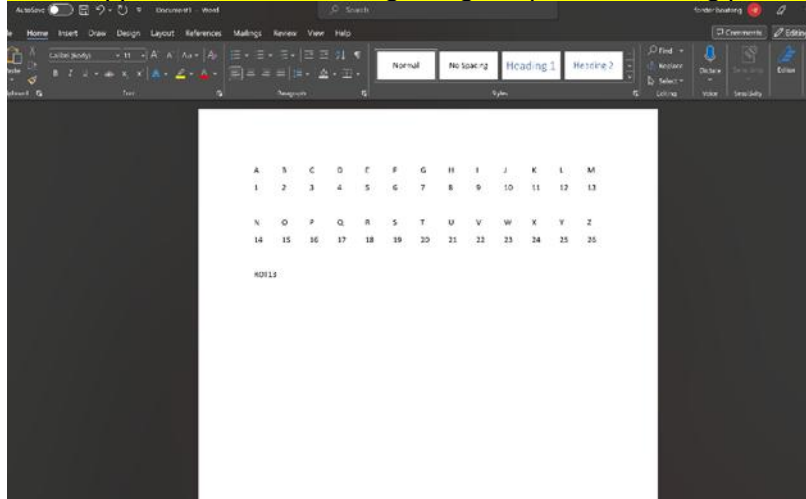


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## 2.10 Name of solved challenge here / 13

Write here shortly how you solved the challenge. Used the ROT 13 table to solved it.

Place supportive screenshots regarding the problem-solving process here.



## 2.11 Name of solved challenge here / Basic mode1

Write here shortly how you solved the challenge. Used python to generate the flag.

Place supportive screenshots regarding the problem-solving process here.

```
rogramiz
ython Online Compiler

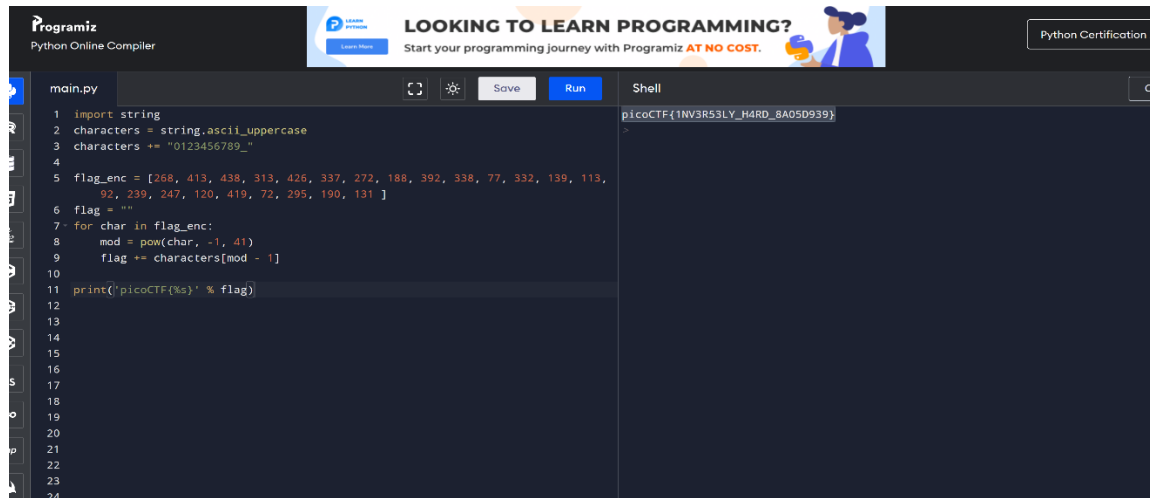
main.py  Save Run Shell
1 import string
2 characters = string.ascii_uppercase
3 characters += "0123456789_"
4
5 flag_enc = [165, 248, 94, 346, 299, 73, 198, 221, 313, 137, 205, 87, 336, 110, 186,
6             , 69, 223, 213, 216, 216, 177, 138 ]
7 flag = ""
8 for char in flag_enc:
9     mod = char % 37
10    flag += characters[mod]
11 print('picoCTF{ss}' % flag)
12
13
14
15
16
17
18
```

## 2.12 Name of solved challenge here / Basic mode 2

Write here shortly how you solved the challenge. Used python to generate the flag.

Place supportive screenshots regarding the problem-solving process here.

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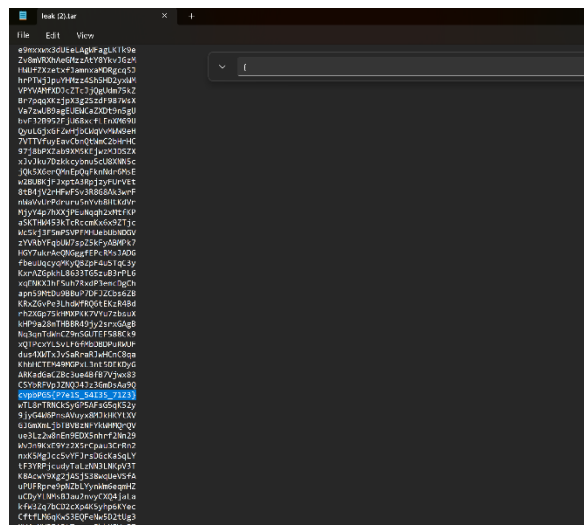


```
1 import string
2 characters = string.ascii_uppercase
3 characters += "0123456789_"
4
5 flag_enc = [268, 413, 438, 313, 426, 337, 272, 188, 392, 338, 77, 332, 139, 113,
6             92, 239, 247, 120, 419, 72, 295, 190, 131 ]
7
8 flag = ""
9 for char in flag_enc:
10     mod = pow(char, -1, 41)
11     flag += characters[(mod - 1)]
12
13 print('picoCTF{1NV3R53LY_H4RD_8A05D939}')
```

## 2.13 Name of solved challenge here / Credstuff

Write here shortly how you solved the challenge. ROT 13 table was used to decode the flag in the given text.

Place supportive screenshots regarding the problem-solving process here.

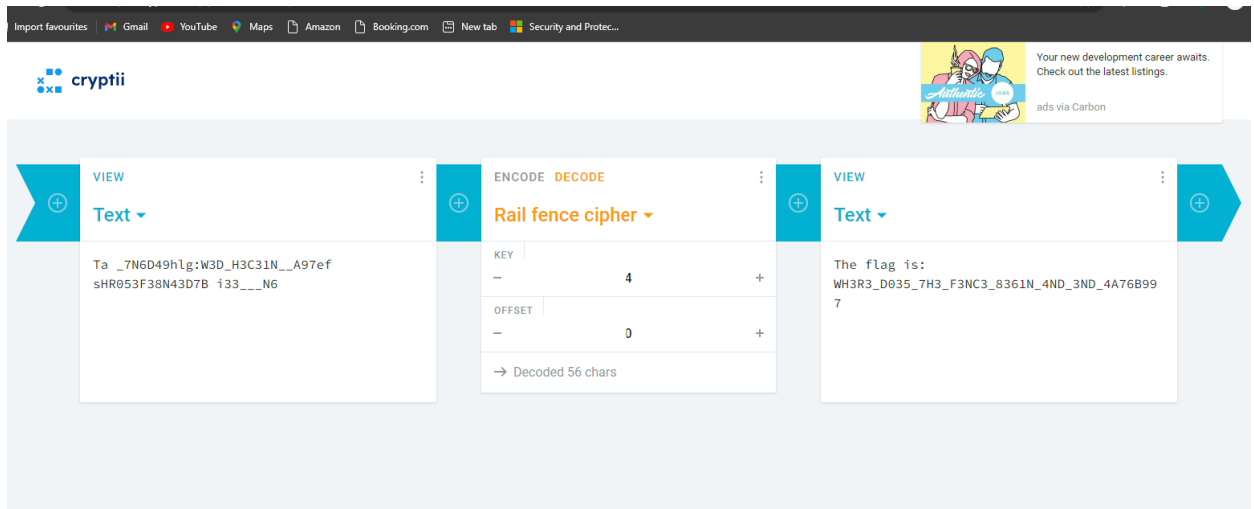


## 2.14 Name of solved challenge here / Railfence

Write here shortly how you solved the challenge. Crytli was used to generate the flag from the given text.

Place supportive screenshots regarding the problem-solving process here.

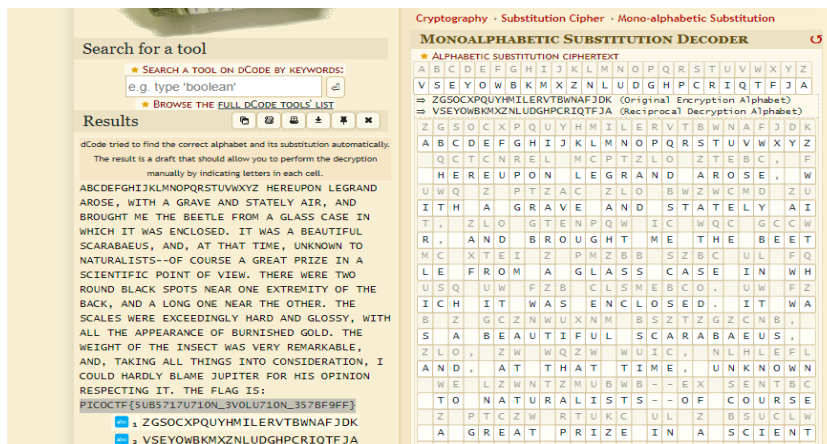
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2.15 Name of solved challenge here / Substitution 0

Write here shortly how you solved the challenge. Online tool named dcode was used to decode the text.

Place supportive screenshots regarding the problem-solving process here.



2.16 Name of solved challenge here / Substitution 1

Write here shortly how you solved the challenge. Online tool named quipquip was used to decode the text.



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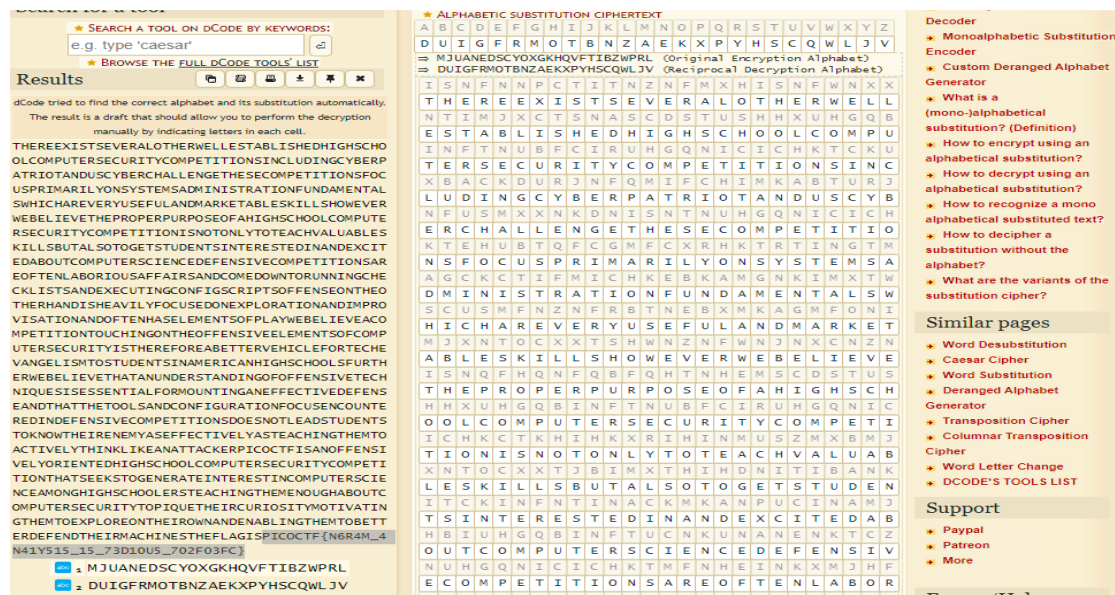
Place supportive screenshots regarding the problem-solving process here.



2.17 Name of solved challenge here / Substitution 2

Write here shortly how you solved the challenge. Online tool was used to decode the text.

Place supportive screenshots regarding the problem-solving process here.



2.18 Name of solved challenge here / Transposition trial

Write here shortly how you solved the challenge. Python was used to print out the flag.


Place supportive screenshots regarding the problem-solving process here.

irogramiz

Python Online Compiler



Olen Suomen luotetuin katto.

TEE HINTA-ARVIO MINUUTISSA

Ruukki  
Building your tomorrow.

Python Certification >

main.py



Save

Run

Shell

Clear

```
1
2 def main():
3     txt = 'heTfl g as iicpCTo{7F4NRPO51N5_16_35P3X51N3_V6E5926A}4'
4     n=3
5     txt3gram = [txt[i:i+n] for i in range(0, len(txt), n)]
6     decode_lst = []
7     for i in range(len(txt3gram)):
8         decode_lst.append(txt3gram[i][2]+txt3gram[i][0]+txt3gram[i][1])
9     print(''.join(decode_lst))
10 if __name__ == '__main__':
11     main()
12
13
14
15
16
17
```

The flag is `picoCTF{7R4N5P051N6_15_3XP3N51V3_56E6924A}`  
>

Place supportive screenshots regarding the problem-solving process here.

Place supportive screenshots regarding the problem-solving process here.

Contents

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Usage

Letter flags (with ICS meaning)

Number flags

Substitute

See also

References

External links

Sailrite and the flag of Finland.

Letter flags (with ICS meaning) [ edit ]

Main article: International Code of Signals

Letter flags and ICS meanings

Letter / radio name	Flag	Blazon	ICS meaning as single flag	Meaning when used with numeric complements
A Alfa		<i>Swa<b>l</b>owtailed, per pale argent and azure</i>	"I have a <b>d</b> iver down; keep well clear at slow speed."	Azimuth or bearing
B Bravo		<i>Swa<b>v</b>ilowtailed, gules</i>	"I am taking in or discharging or carrying dangerous goods " (Originally used by the <i>Royal Navy</i> specifically for military explosives.)	
C Charlie		<i>Azure, a fess gules fimbriated argent</i>	"Affirmative." <sup>[a][b]</sup>	Course in degrees magnetic
D Delta		<i>Or, a Spanish fess azure</i>	"Keep clear of me; I am maneuvering with difficulty." <sup>[b]</sup>	Date
E Echo		<i>Per fess azure and gules</i>	"I am altering my course to starboard." <sup>[b]</sup>	
F Foxtrot		<i>Argent, a lozenge throughout gules</i>	"I am disabled; communicate with me." <sup>[c]</sup>	
G Golf		<i>Paly of six or and azure</i>	"I require a pilot." <i>By fishing vessels near fishing grounds:</i> "I am hauling nets."	Longitude (The first 2 or 3 digits denote degrees, the last 2 denote minutes.)
H Hotel		<i>Per pale argent and gules</i>	"I have a pilot on board." <sup>[b]</sup>	
I India		<i>Or, a pellet</i>	"I am altering my course to port." <sup>[b]</sup>	

Place supportive screenshots regarding the problem-solving process here.

```

https://webshell.picoctf.org
Import favourites Gmail YouTube Maps Amazon Booking.com New tab Security and Protec...
Enter your picoCTF username: forster-boating
Enter your picoCTF password (characters will be hidden):
=====
Welcome to the picoCTF webshell!

The webshell is intended only for solving picoCTF challenges. Any
other usage is a violation of our terms and conditions.

Sessions are monitored and logged to prevent abuse. Please do not
enter any sensitive information into the webshell.

Files stored outside of your home directory will not persist between
webshell sessions.

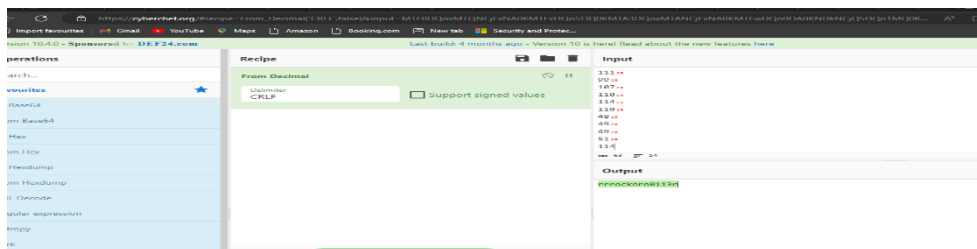
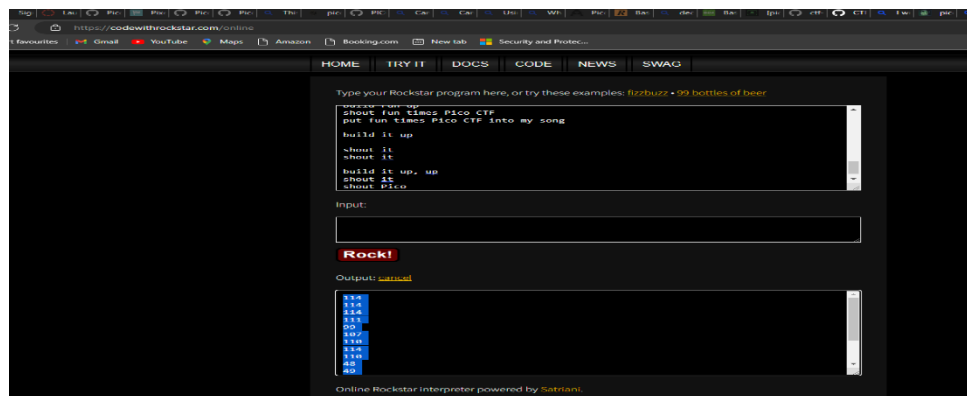
Network connectivity and resources are limited. Some limits can be
checked by typing 'usage'.

Idle sessions will automatically log out after 15 minutes.

For more information and a beginner's guide, type less ~/README.txt.
=====
forster-boating@webshell:~$ nc jupiter.challenges.picoctf.org 14291 |grep picoCTF
[apt-get, plumbum, pipenv, etc.]

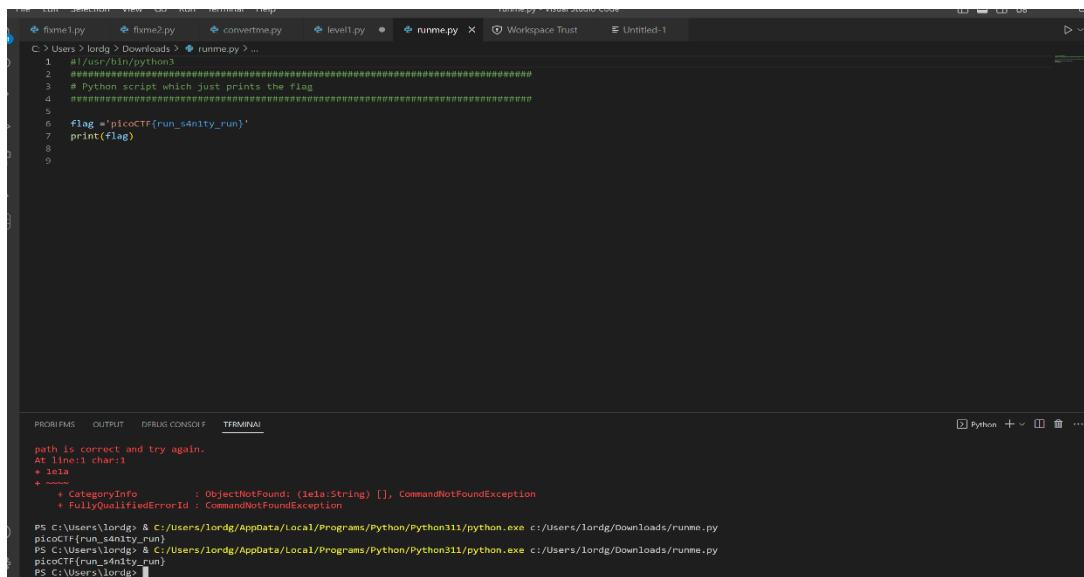
```

Place supportive screenshots regarding the problem-solving process here.



Place supportive screenshots regarding the problem-solving process here.

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```
C:\Users\lordg> cd Downloads & .\runme.py > ...
1 #!/usr/bin/python3
2 #####
3 # Python script which just prints the flag
4 #####
5
6 flag = 'picoCTF{run_sanity_run}'
7 print(flag)
8
9

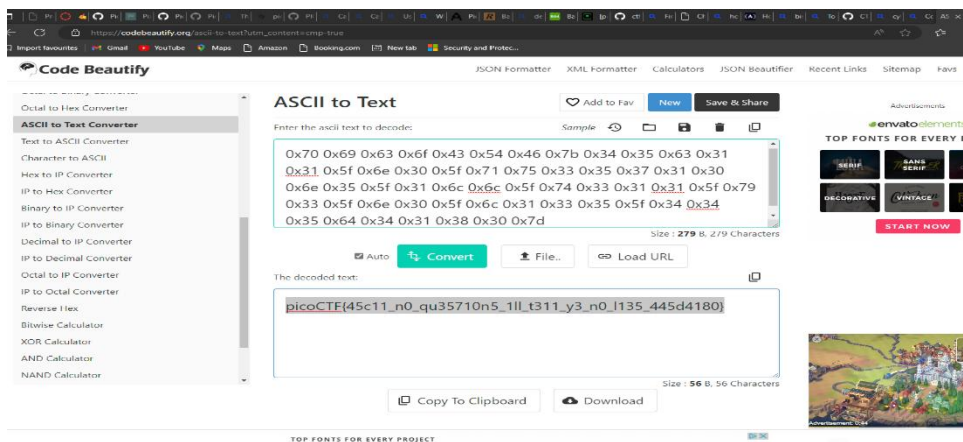
PS C:\Users\lordg> & C:/Users/lordg/AppData/Local/Programs/Python/Python311/python.exe c:/Users/lordg/Downloads/runme.py
path is correct and try again.
At line:1 char:1
+ iela
+ ~~~~
+ CategoryInfo          : ObjectNotFound: (iela:String) [], CommandNotFoundException
+ FullyQualifiedErrorId : CommandNotFoundException

PS C:\Users\lordg> & C:/Users/lordg/AppData/Local/Programs/Python/Python311/python.exe c:/Users/lordg/Downloads/runme.py
picoCTF{run_sanity_run}
PS C:\Users\lordg> & C:/Users/lordg/AppData/Local/Programs/Python/Python311/python.exe c:/Users/lordg/Downloads/runme.py
picoCTF{run_sanity_run}
PS C:\Users\lordg>
```

## 2.25 Name of solved challenge here / ASCII

Write here shortly how you solved the challenge. I used online tool called codebeautify to convert ASCII strings to the flag.

Place supportive screenshots regarding the problem-solving process here.

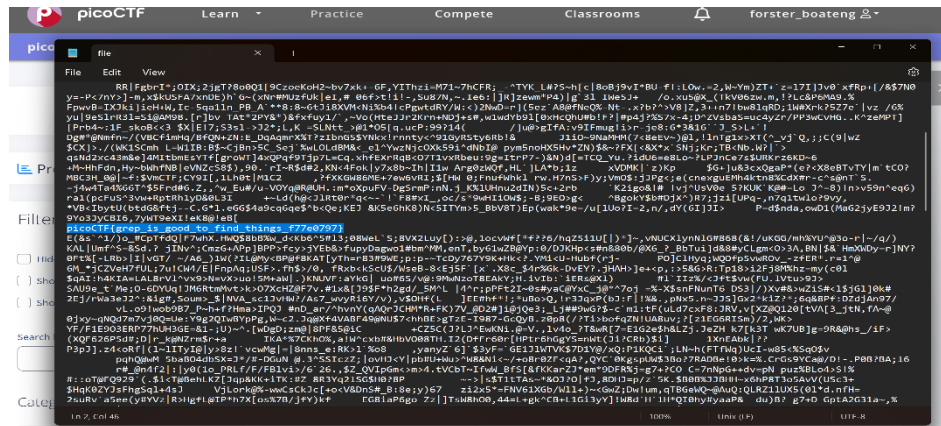


## 2.26 Name of solved challenge here / Bases

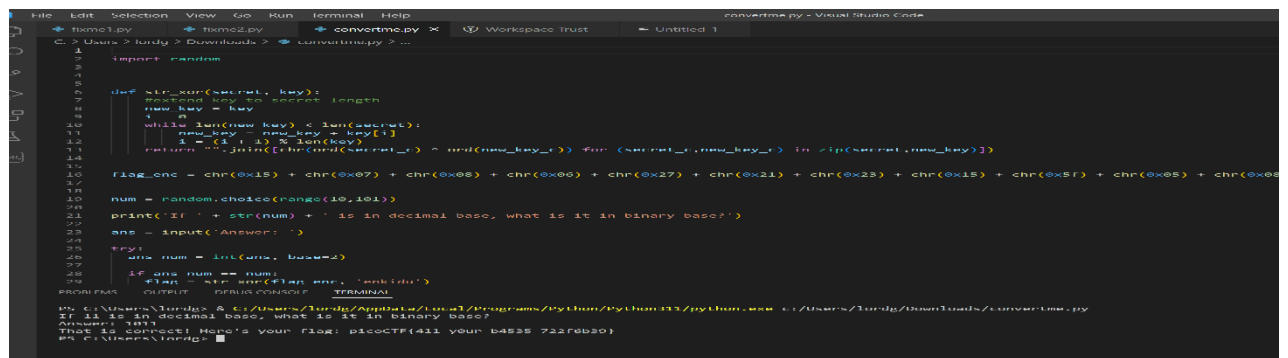
Write here shortly how you solved the challenge. Used online tool cyberchef solved the problem.

Place supportive screenshots regarding the problem-solving process here.

Place supportive screenshots regarding the problem-solving process here.



Place supportive screenshots regarding the problem-solving process here.



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## 2.29 Name of solved challenge here / fixme1.py

Write here shortly how you solved the challenge. I fixed the python syntax and that led to the flag.

Place supportive screenshots regarding the problem-solving process here.

```

1
2 import random
3
4
5 def str_xor(secret, key):
6     #extend key to secret length
7     new_key = key
8     i = 0
9     while len(new_key) < len(secret):
10         new_key = new_key + key[i]
11         i = (i + 1) % len(key)
12     return ''.join([chr(ord(secret_c) ^ ord(new_key_c)) for (secret_c, new_key_c)
13                     in zip(secret, new_key)])
14
15
16 flag_enc = chr(0x15) + chr(0x07) + chr(0x08) + chr(0x06) + chr(0x27) + chr(0x21)
17             + chr(0x23) + chr(0x15) + chr(0x5a) + chr(0x07) + chr(0x00) + chr(0x4e) + chr
18             (0x0b) + chr(0x1a) + chr(0x5a) + chr(0x1d) + chr(0x1d) + chr(0x2a) + chr(0x06
19             ) + chr(0x1c) + chr(0x59) + chr(0x5c) + chr(0x55) + chr(0x40) + chr(0x3a) +
20             chr(0x5a) + chr(0x52) + chr(0x0c) + chr(0x01) + chr(0x42) + chr(0x37) + chr
21             (0x59) + chr(0x0a) + chr(0x14)
22
23 flag = str_xor(flag_enc, 'mekidu')
24 print('That is correct! Here's your flag: ' + flag)
25
26
27
28
  
```

Shell: That is correct! Here's your flag: picoCTF{1nd3m1t1y\_cr1515\_09ee722a}

## 2.30 Name of solved challenge here / fixedme2.py

Write here shortly how you solved the challenge. I fixed the python syntax and that led to the flag.

Place supportive screenshots regarding the problem-solving process here.

```

1
2 import random
3
4
5 def str_xor(secret, key):
6     #extend key to secret length
7     new_key = key
8     i = 0
9     while len(new_key) < len(secret):
10         new_key = new_key + key[i]
11         i = (i + 1) % len(key)
12     return ''.join([chr(ord(secret_c) ^ ord(new_key_c)) for (secret_c, new_key_c)
13                     in zip(secret, new_key)])
14
15
16 #flag_enc = chr(0x15) + chr(0x07) + chr(0x08) + chr(0x06) + chr(0x27) + chr(0x21) + chr(0x23) + chr(0x15) + chr(0x5a) + chr(0x1d) + chr(0x1d) + chr(0x2a) + chr(0x06) + chr
17             + chr(0x1c) + chr(0x59) + chr(0x5c) + chr(0x55) + chr(0x40) + chr(0x3a) + chr(0x5a) + chr(0x52) + chr(0x0c) + chr(0x01) + chr(0x42) + chr(0x37) + chr(0x59) + chr(0x0a) + chr(0x14)
18
19 flag = str_xor(flag_enc, 'mekidu')
20
21 # Check that flag is not empty
22 if flag == '':
23     print('String XOR encountered a problem, quitting.')
24 else:
25     print('That is correct! Here's your flag: ' + flag)
26
27
28
29
  
```

TERMINAL:
   
PS C:\Users\londg> & C:\Users\londg\AppData\Local\Programs\Python\Python311\python.exe c:/Users/londg/Downloads/fixme1.py
   
That is correct! Here's your flag: picoCTF{1nd3m1t1y\_cr1515\_09ee722a}
   
PS C:\Users\londg> & C:\Users\londg\AppData\Local\Programs\Python\Python311\python.exe c:/Users/londg/Downloads/fixme2.py
   
That is correct! Here's your flag: picoCTF{quality\_not\_400gmmont\_4662c11b}
   
PS C:\Users\londg> picoCTF{quality\_not\_400gmmont\_4662c11b}

## 2.31 Name of solved challenge here / Glitch\_cat

Write here shortly how you solved the challenge. I used python to print out the flag.

Place supportive screenshots regarding the problem-solving process here.

```

1 print(picoCTF{glitch_cat_0722a5d + chr(0x15) + chr(0x07) + chr(0x08) + chr(0x06) + chr(0x27) + chr(0x21) + chr(0x23) + chr(0x15) + chr(0x5a) + chr(0x1d) + chr(0x1d) + chr(0x2a) + chr(0x06) + chr(0x1c) + chr(0x59) + chr(0x5c) + chr(0x55) + chr(0x40) + chr(0x3a) + chr(0x5a) + chr(0x52) + chr(0x0c) + chr(0x01) + chr(0x42) + chr(0x37) + chr(0x59) + chr(0x0a) + chr(0x14)})
2
3
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15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
  
```

Shell: picoCTF{glitch\_cat\_0722a5d}

## 2.32 Name of solved challenge here / What is a net cat?

Write here shortly how you solved the challenge. I used picoCTF webshell to run the command line in order to find the flag.

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Place supportive screenshots regarding the problem-solving process here.

```

151 forster-boateng-picoctf@webshell:~$ gdb gdbme
yes
GNU GDB (Ubuntu 12.0.90-0ubuntu1) 12.0.90
Copyright (C) 2022 Free Software Foundation, Inc.
License GPLv3+: GNU GPL version 3 or later <http://gnu.org/licenses/gpl.html>
This is free software: you are free to change and redistribute it.
There is NO WARRANTY, to the extent permitted by law.
Type "show copying" and "show warranty" for details.
Type "show configuration" for configuration details.
For bug reporting instructions, please see:
<http://www.gnu.org/software/gdb/bugs/>
Find the GDB manual and other documentation resources online at:
<http://www.gnu.org/software/gdb/documentation/>.

For help, type "help".
Type "apropos word" to search for commands related to "word"...
gdbme: No such file or directory.
(gdb)
(gdb)
(gdb) Quit
(gdb)
(gdb) Quit
(gdb)
[1]+  Stopped                  gdb gdbme
forster-boateng-picoctf@webshell:~$
forster-boateng-picoctf@webshell:~$ netcat
usage: nc [-m minttl] [-O length] [-i interval] [-M ttl]
          [-P proxy_username] [-p source_port]
          [-q seconds] [-s sourceaddr] [-T keyword] [-V rttable] [-W recvlimit]
          [-w timeout] [-X proxy_address] [-Z proxy_port]
          [destination] [port]
forster-boateng-picoctf@webshell:~$ jupiter.challenges.picoctf.org 25103
-bash: jupiter.challenges.picoctf.org: command not found
forster-boateng-picoctf@webshell:~$ nc jupiter.challenges.picoctf.org 25103
You're on your way to becoming the net cat master
picoCTF{netcat_Mastery_doc64567}

```

2.33 Name of solved challenge here / Strings it.

Write here shortly how you solved the challenge. I copied the text into note pad and then searched for the flag.

Place supportive screenshots regarding the problem-solving process here.

```

File Edit View
strings
n0Rn1M5C7P12T0r.D6m7T0uue
m0K2X13Mm0z0AVaVn0rQ0LAA5u0Ct_u0p0Y
Ht0p0d0p0m0d0n0g0d0p0d
...
picoCTF{string_1t_0007b07}
...

```

2.34 Name of solved challenge here / vault-door-training.

Write here shortly how you solved the challenge. The flag is the password in the code given.

Place supportive screenshots regarding the problem-solving process here.

```

e Edit View
import java.util.*;

class VaultDoorTraining {
    public static void main(String args[]) {
        VaultDoorTraining vaultDoor = new VaultDoorTraining();
        Scanner scanner = new Scanner(System.in);
        System.out.println("Enter vault password: ");
        String userInput = scanner.next();
        String input = userInput.substring("picoCTF".length(), userInput.length()-1);
        if (vaultDoor.checkPassword(input)) {
            System.out.println("Access granted.");
        } else {
            System.out.println("Access denied!");
        }
    }

    // The password is below. Is it safe to put the password in the source code?
    // What if somebody stole our source code? Then they would know what our
    // password is. Hmm... I will think of some ways to improve the security
    // on the other doors.
    //
    // -Minion #9567
    public boolean checkPassword(String password) {
        return password.equals("w4rm1ng_Up_w1th_jAv4_bE8d9806f18");
    }
}

```

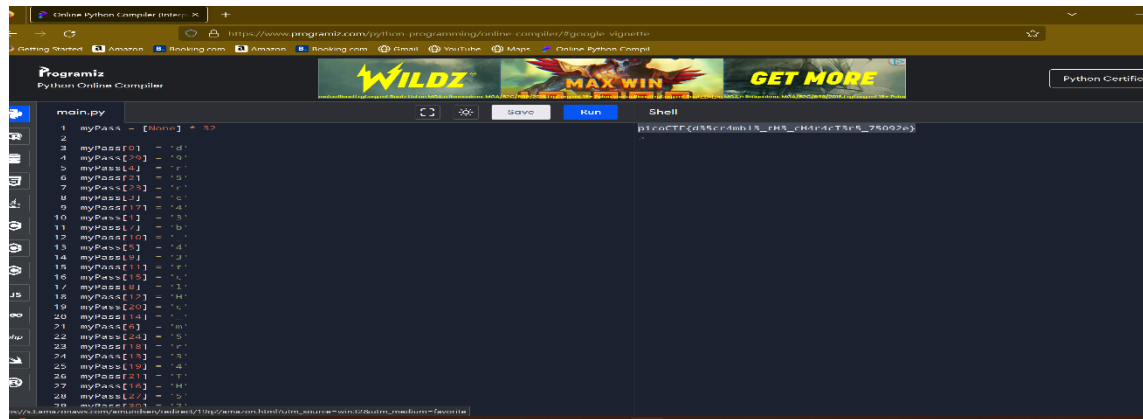


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### 2.35 Name of solved challenge here / Vault-door1.

Write here shortly how you solved the challenge. Online python compiler was used to run the code and then printed the flag as shown in the image below.

Place supportive screenshots regarding the problem-solving process here.

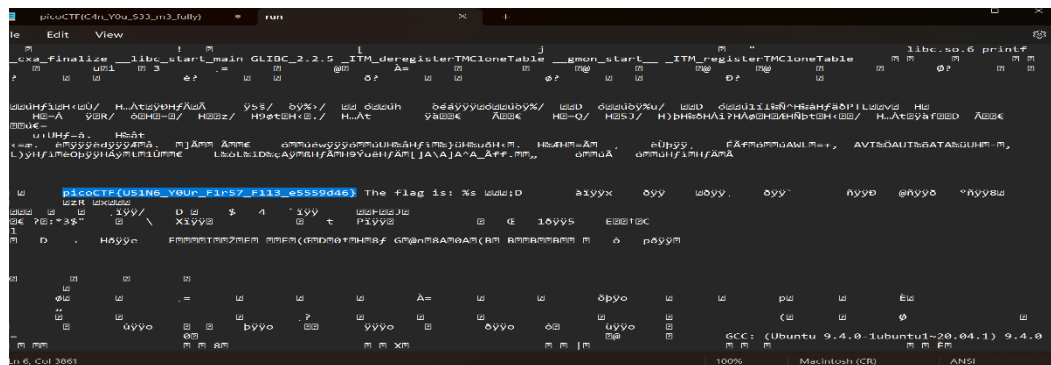


The screenshot shows an online Python compiler interface. On the left, a file named 'main.py' contains a list of 28 'myPass' values, each assigned a string. On the right, a 'Shell' terminal window shows the command 'picoCTF{d55c4db13\_rh5\_rh5f4ct5r5\_750926}' being executed, which results in the flag being printed.

### 2.36 Name of solved challenge here / File-run1.

Write here shortly how you solved the challenge. I spotted the flag in the given program.

Place supportive screenshots regarding the problem-solving process here.



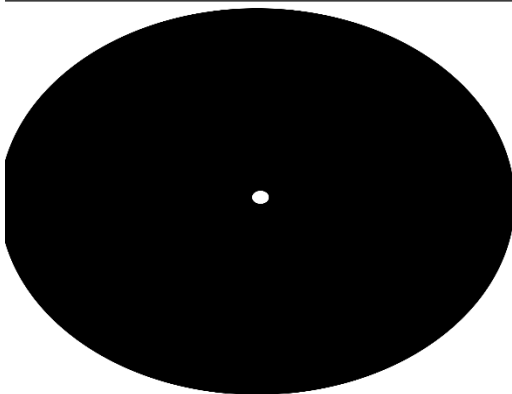
The screenshot shows a C program being compiled and run. The output of the program is displayed in a terminal window, showing a flag: 'picoCTF{USING\_YOUR\_FIRST\_FLAG\_5559d46}'. The flag is preceded by 'The flag is: %s' and followed by a newline character.

### 2.37 Name of solved challenge here / File-run2.

Write here shortly how you solved the challenge. I spotted the flag in the given program.

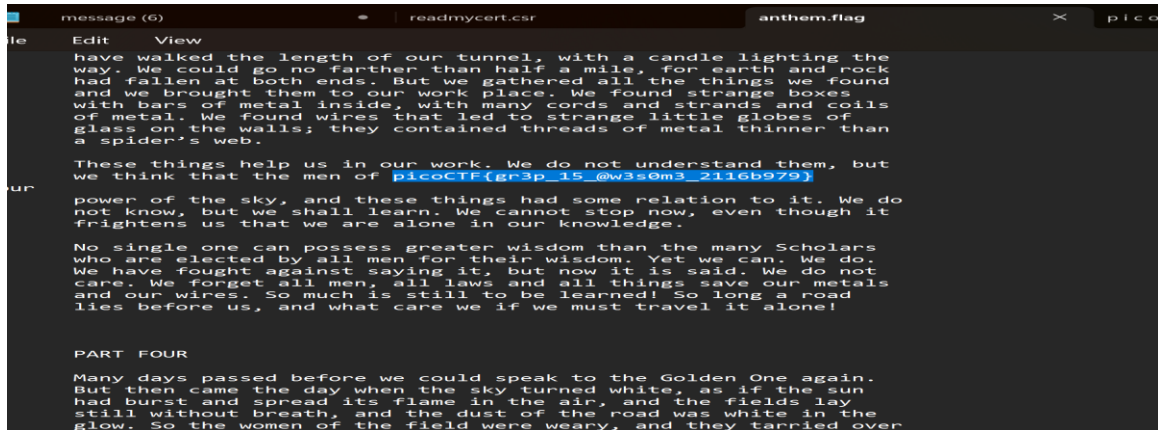
Place supportive screenshots regarding the problem-solving process here.



[illegible]

Place supportive screenshots regarding the problem-solving process here.

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```
message (6) | readmycert.csr | anthem.flag | pico
le Edit View
have walked the length of our tunnel, with a candle lighting the
way. We could go no farther than half a mile, for earth and rock
had fallen at both ends. But we gathered all the things we found
and we brought them to our work place. We found strange boxes
with bars of metal inside, with many cords and strands and coils
of metal. We found wires that led to strange little globes of
glass on the walls; they contained threads of metal thinner than
a spider's web.

These things help us in our work. We do not understand them, but
we think that the men of picoCTF{gr3p_15_@w3s0m3_2116b979}

power of the sky, and these things had some relation to it. We do
not know, but we shall learn. We cannot stop now, even though it
frightens us that we are alone in our knowledge.

No single one can possess greater wisdom than the many Scholars
who are elected by all men for their wisdom. Yet we can. We do.
We have fought against saying it, but now it is said. We do not
care. We forget all men, all laws and all things save our metals
and our wires. So much is still to be learned! So long a road
lies before us, and what care we if we must travel it alone!

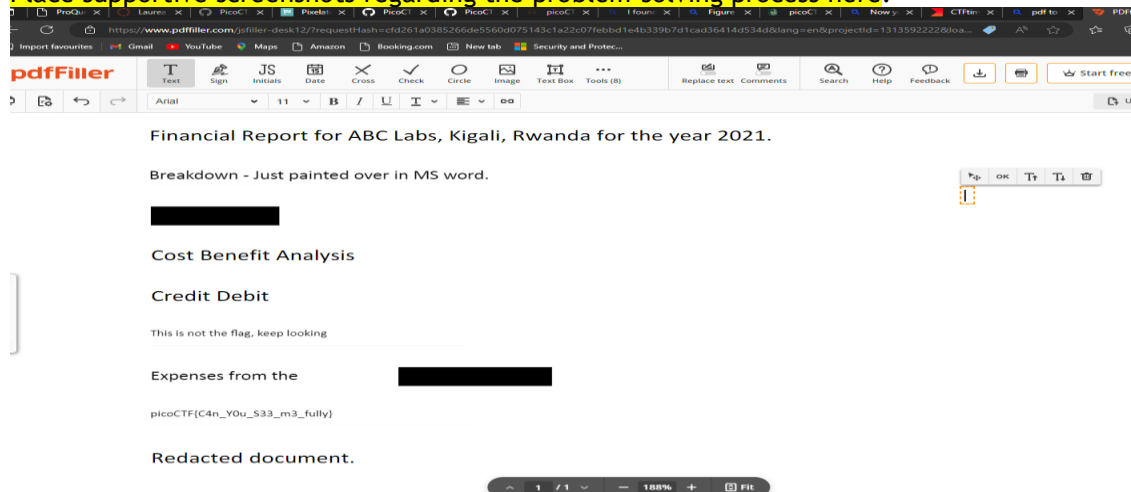
PART FOUR

Many days passed before we could speak to the Golden One again.
But then came the day when the sky turned white, as if the sun
had burst and spread its flame in the air, and the fields lay
still without breath, and the dust of the road was white in the
glow. So the women of the field were weary, and they tarried over
```

2.40 Name of solved challenge here / Redacted.

Write here shortly how you solved the challenge. I used online tool called pdffiller to find the text that has been redacted and this revealed the flag.

Place supportive screenshots regarding the problem-solving process here.



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### 3 Reflection

Write here a reflection regarding your CTF-training. Kindly describe what was rewarding, what was challenging and what could be improved in the future.

The training has been fun and interesting. In the beginning, it was challenging but it turned out to be fun when I understood the rules behind it. I could not be solved much of forensic and web exploration because I lacked some understanding of what is being demanded to capture the flag. I have also taken much interest in cryptography and have been introduced to lots of online code interpreters.

I would need to improve on my python skills and Linux.

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## References

<Add your references here> Please note that references are not written in accordance with Laurea's lay down methods.

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<https://cryptii.com/pipes/caesar-cipher>

<https://cyberchef.org/>

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