20220207-CTF-MISC-第11题--- base64隐写--附带脚本

原创

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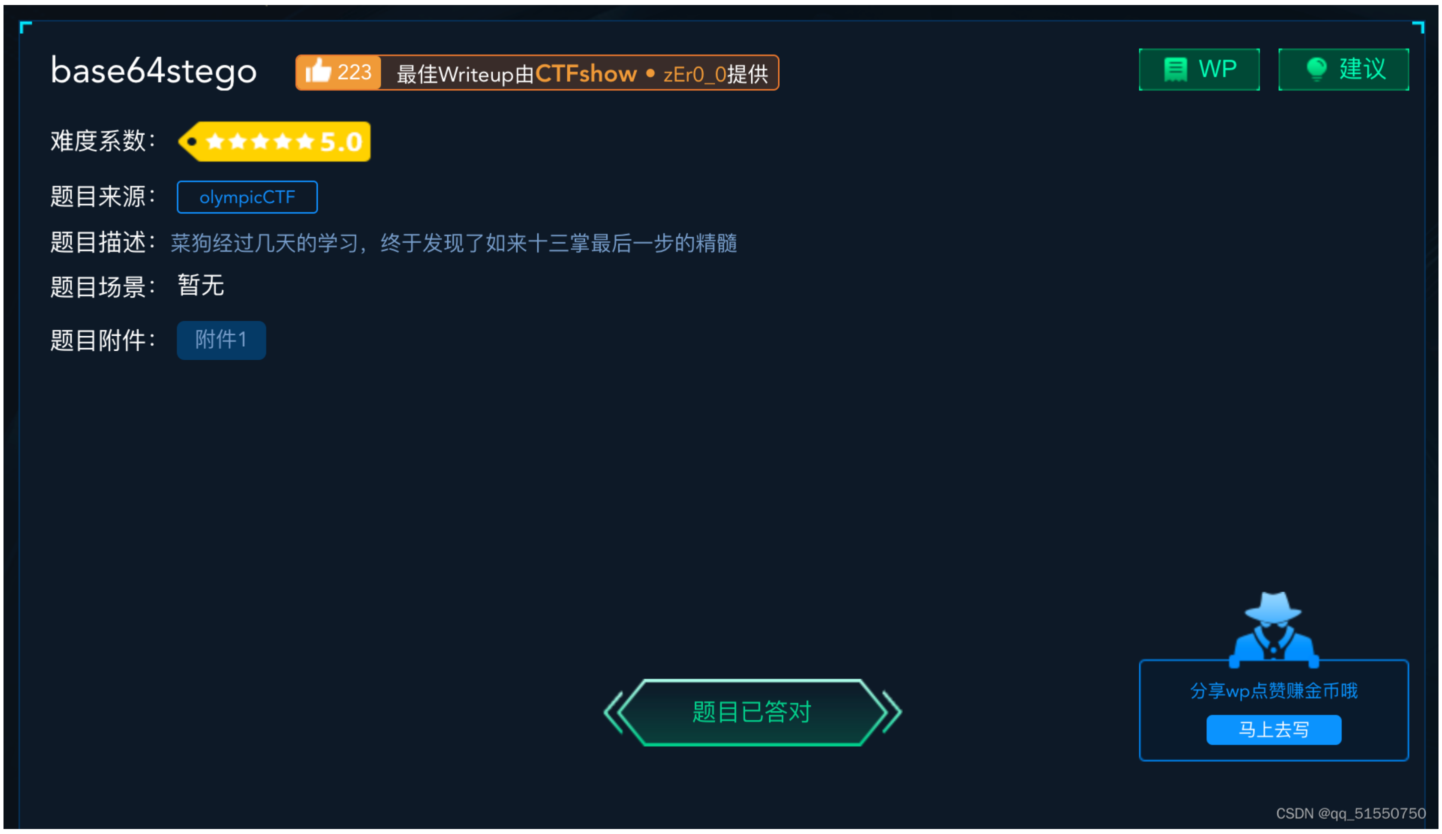
攻防世界- MISC新手区–第11题–base64隐写



base64stego 👍223 最佳Writeup由CTFshow • zEr0_0提供

WP 建议

难度系数：★★★★★ 5.0

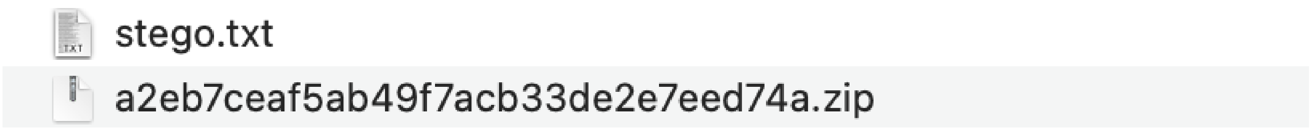
题目来源：olympicCTF

题目描述：菜狗经过几天的学习，终于发现了如来十三掌最后一步的精髓

题目场景：暂无

题目附件：附件1

下载之后解压，是stego.txt



stego.txt
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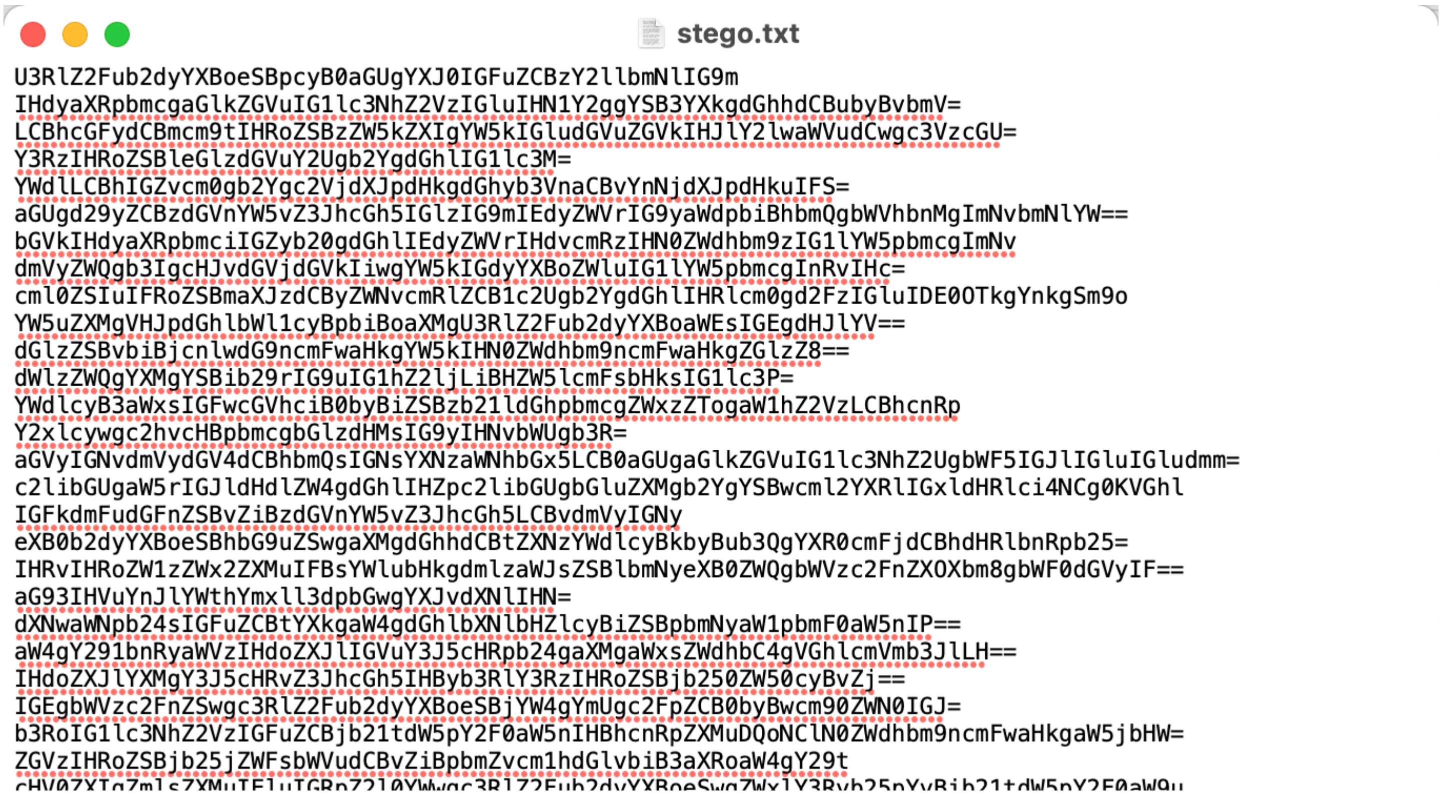
打开stego.txt



stego.txt

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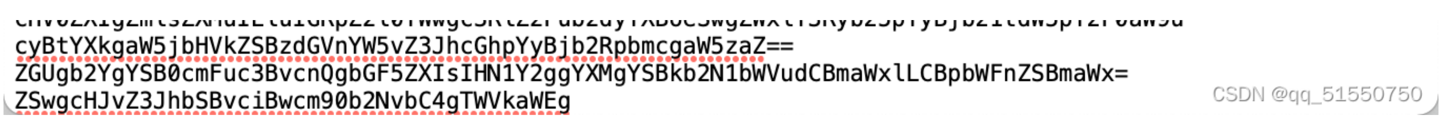

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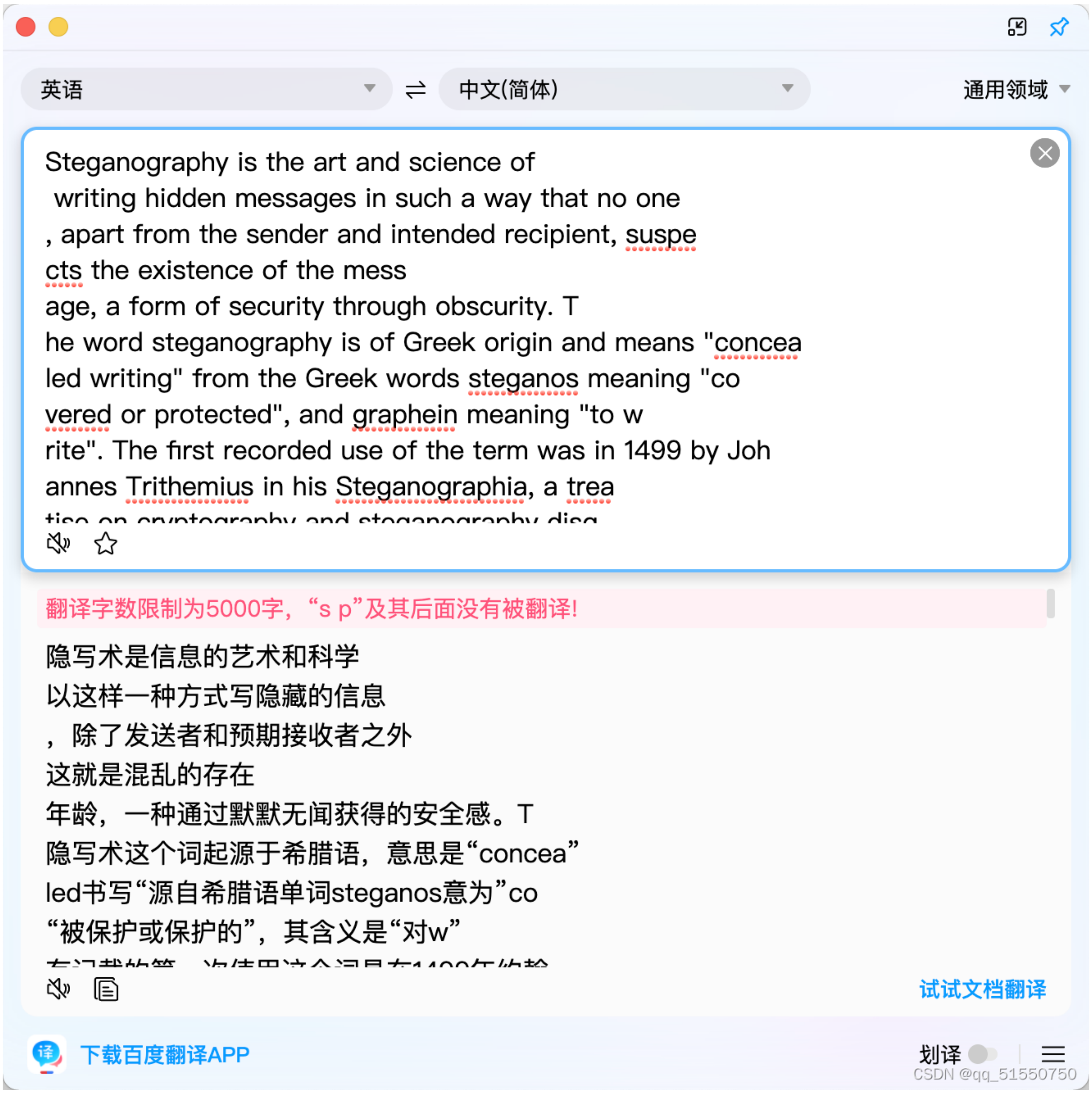
CSDN @qq_51550750

显然是base64编码之后的结果，base64解码，我还百度翻译了一下，也没什么发现。



Steganography is the art and science of
 writing hidden messages in such a way that no one
, apart from the sender and intended recipient, suspe
cts the existence of the mess
age, a form of security through obscurity. T
he word steganography is of Greek origin and means "concea
led writing" from the Greek words steganos meaning "co
vered or protected", and graphein meaning "to w
rite". The first recorded use of the term was in 1499 by Joh
annes Trithemius in his Steganographia, a trea
[illegible]

翻译字数限制为5000字，“s p”及其后面没有被翻译!

隐写术是信息的艺术和科学
以这样一种方式写隐藏的信息
，除了发送者和预期接收者之外
这就是混乱的存在
年龄，一种通过默默无闻获得的安全感。T
隐写术这个词起源于希腊语，意思是“concea”
led书写“源自希腊语单词steganos意为”co
“被保护或保护的”，其含义是“对w”
[illegible]

CSDN @qq_51550750

于是想办法，因为没有MISC的基础，就去看了WP，知道是base64隐写。于是查阅资料了解了一下。

base64隐写的原理

（1）起因：

俄罗斯有个叫 Olympic_ctf 的 CTF, 在 2014 年有道 misc 题是关于 Base64 的隐写题.

大意就是给了你一段字符串, 让你找 flag.
这里放上字符串, 便于读者实验

```
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dGhlIHVuc3VzcGVjdGluZyBOb3J0aCBLb3JlYW5zLCBpbiBhbiBhdHRlbXB0IHRvIE==
ZGlzY3JlZGl0IHBob3RvcyB0aGF0IHNob3dlZCB0aGVtIHNtaQ==
bGluZyBhbmQgY29tZm9ydGFibGUuDQoNCi0tDQpodHRwOi8vZW4ud2lraXBlZGlhLm9yZw==
L3dpa2kvU3RlZ2Fub2dyYXBoeQ0K
```

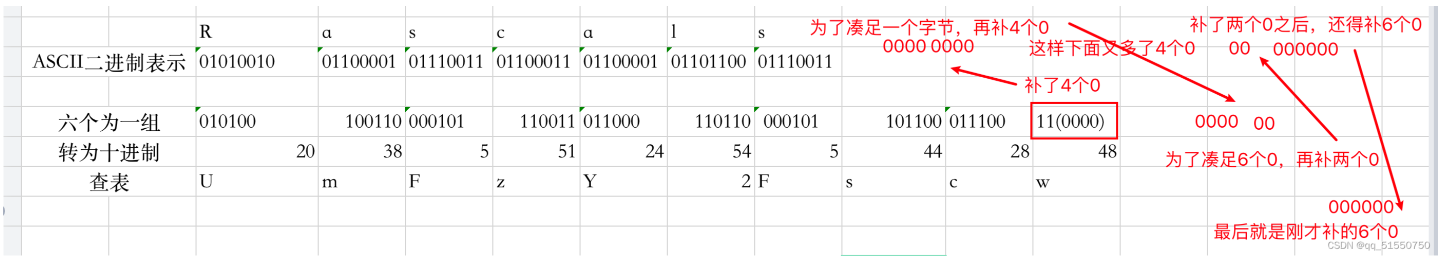
（2）复习base64编码

BASE64 是一种编码方式, 是一种**可逆**的编码方式.
编码后的数据是一个字符串, 包含的字符为: A-Za-z0-9+/
共 64 个字符：26 + 26 + 10 + 1 + 1 = 64
其实是 65 个字符, = 是填充字符.

64 个字符需要 6 位二进制来表示
2^5=32
2^6=64
表示成数值为 0~63.

索引	对应字符	索引	对应字符	索引	对应字符	索引	对应字符
0	**A**	17	**R**	34	**i**	51	**z**
1	**B**	18	**S**	35	**j**	52	**0**
2	**C**	19	**T**	36	**k**	53	**1**
3	**D**	20	**U**	37	**l**	54	**2**
4	**E**	21	**V**	38	**m**	55	**3**
5	**F**	22	**W**	39	**n**	56	**4**
6	**G**	23	**X**	40	**o**	57	**5**
7	**H**	24	**Y**	41	**p**	58	**6**
8	**I**	25	**Z**	42	**q**	59	**7**
9	**J**	26	**a**	43	**r**	60	**8**
10	**K**	27	**b**	44	**s**	61	**9**
11	**L**	28	**c**	45	**t**	62	**+**
12	**M**	29	**d**	46	**u**	63	**/**
13	**N**	30	**e**	47	**v**		
14	**O**	31	**f**	48	**w**		
15	**P**	32	**g**	49	**x**		
16	**Q**	33	**h**	50	**y**		

比如, 字符串"Rascals"经过 Base64 编码后变为"UmFzY2Fscw=="



	R	a	s	c	a	l	s			
ASCII二进制表示	01010010	01100001	01110011	01100011	01100001	01101100	01110011			
六个为一组	010100	100110	000101	110011	011000	110110	000101	101100	011100	11(0000)
转为十进制	20	38	5	51	24	54	5	44	28	48
查表	U	m	F	z	Y	2	F	s	c	w

为了凑足一个字节，再补4个0
0000 0000
这样下面又多了4个0
补了4个0
补了两个0之后，还得补6个0
00 000000
0000 00
为了凑足6个0，再补两个0
000000
最后就是刚才补的6个0
CSDN @qq_51550750

上面的 图，完整展示了为什么转化后面会多出两个=，原因是后面补了两个000000

概括来说，出现等号是因为：
需在原数据二进制值后面添加零, 使其字节数是 6 的倍数.
然后, 在编码后的字符串后面添加 1 个或 2 个等号"=", 表示所添加的零值字节数.

按照上面的逻辑，同理：
长度为 3 个字节的数据经过 Base64 编码后就变为 4 个字节 3*8=6*4*

（3）base64隐写原理

从Base64编码的原理可得Base64解码的过程：

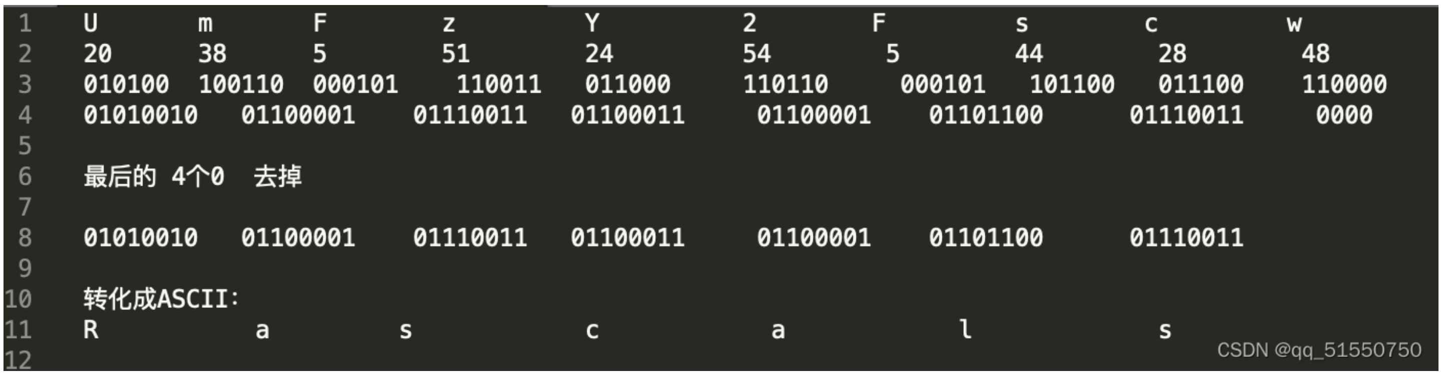
```
丢掉末尾的所有‘=’；
每个字符查表转换为对应的6位索引，得到一串二进制字符串；
从头开始，每次取8位转换为对应的ASCII字符，如果不足8位则丢弃。
```

以上面刚才用到的例子：

> 字符串"Rascals"经过 Base64 编码后变为"UmFzY2Fscw=="

做解析：
UmFzY2Fscw== 首先丢掉末尾的==，得到UmFzY2Fscw
然后 每个字符查表转换为对应的6位索引

后面的完整过程如下：



```
U        m        F          z        Y          2          F          s        c         w
20       38       5          51       24         54         5          44       28        48
010100   100110   000101     110011   011000     110110     000101     101100   011100    110000
01010010    01100001    01110011    01100011     01100001    01101100      01110011     0000

最后的 4个0  去掉

01010010    01100001    01110011    01100011     01100001    01101100      01110011

转化成ASCII:
R           a           s           c            a           l             s
```

CSDN @qq_51550750

在解码的过程中中，会有部分数据被丢弃（即不会影响解码结果），这些数据正是我们在编码过程中补的0
也就是说，如果我们在编码过程中不全用0填充，而是用其他的数据填充，仍然可以正常编码解码，因此这些位置可以用于隐写。

解开隐写的方法就是将这些不影响解码结果的位提取出来组成二进制串，然后转换成ASCII字符串。

（4）base64隐写脚本（解密）

python脚本：

```
d='''U3RlZ2Fub2dyYXBoeSBpcyB0aGUgYXJ0IGFuZCBzY2llbmNlIG9m
IHdyaXRpbmcgaGlkZGVuIG1lc3NhZ2VzIGluIHN1Y2ggYSB3YXkgdGhhdCBubyBvbmV=
LCBhcGFydCBmcm9tIHRoZSBzZW5kZXIgYW5kIGludGVuZGVkIHJlY2lwaWVudCwgc3VzcGU=
Y3RzIHRoZSBleGlzdGVuY2Ugb2YgdGhlIG1lc3M=
YWdlLCBhIGZvcm0gb2Ygc2VjdXJpdHkgdGhyb3VnaCBvYnNjdXJpdHkuIFS=
aGUgd29yZCBzdGVnYW5vZ3JhcGh5IGlzIG9mIEdyZWVrIG9yaWdpbiBhbmQgbWVhbnMgImNvbmNlYW==
bGVkIHdyaXRpbmciIGZyb20gdGhlIEdyZWVrIHdvcmRzIHN0ZWdhbm9zIG1lYW5pbmcgImNv
dmVyZWQgb3IgcHJvdGVjdGVkIiwgYW5kIGdyYXBoZWluIG1lYW5pbmcgInRvIHc=
cml0ZSIuIFRoZSBmaXJzdCByZWNvcmRlZCB1c2Ugb2YgdGhlIHRlcm0gd2FzIGluIDE0OTkgYnkgSm9o
YW5uZXMgVHJpdGhlbWl1cyBpbiBoaXMgU3RlZ2Fub2dyYXBoaWEsIGEgdHJlYV==
dGlzZSBvbiBjcnlwdG9ncmFwaHkgYW5kIHN0ZWdhbm9ncmFwaHkgZGlzZ8==
dWlzZWQgYXMgYSBib29rIG9uIG1hZ2ljLiBHZW5lcmFsbHksIG1lc3P=
YWdlcyB3aWxsIGFwcGVhciB0byBiZSBzb21ldGhpbmcgZWxzZTogaW1hZ2VzLCBhcnRp
Y2xlcywgc2hvcHBpbmcgbGlzdHMsIG9yIHNvbWUgb3R=
aGVyIGNvdmVydGV4dCBhbmQsIGNsYXNzaWNhbGx5LCB0aGUgaGlkZGVuIG1lc3NhZ2UgbWF5IGJlIGluIGludmm=
c2libGUgaW5rIGJldHdlZW4gdGhlIHZpc2libGUgbGluZXMgb2YgYSBwcml2YXRlIGxldHRlci4NCg0KVGhl
IGFkdmFudGFnZSBvZiBzdGVnYW5vZ3JhcGh5LCBvdmVyIGNy
eXB0b2dyYXBoeSBhbG9uZSwgaXMgdGhhdCBtZXNzYWdlcyBkbyBub3QgYXR0cmFjdCBhdHRlbnRpb25=
IHRvIHRoZW1zZWx2ZXMuIFBsYWlubHkgdmlzaWJsZSBlbmNyeXB0ZWQgbWVzc2FnZXOXbm8gbWF0dGVyIF==
aG93IHVuYnJlYWthYmxll3dpbGwgYXJvdXNlIHN=
dXNwaWNpb24sIGFuZCBtYXkgaW4gdGhlbXNlbHZlcyBiZSBpbmNyaW1pbmF0aW5nIP==
aW4gY291bnRyaWVzIHdoZXJlIGVuY3J5cHRpb24gaXMgaWxsZWdhbC4gVGhlcmVmb3JlLH==
IHdoZXJlYXMgY3J5cHRvZ3JhcGh5IHByb3RlY3RzIHRoZSBjb250ZW50cyBvZj==
IGEgbWVzc2FnZSwgc3RlZ2Fub2dyYXBoeSBjYW4gYmUgc2FpZCB0byBwcm90ZWN0IGJ=
b3RoIG1lc3NhZ2VzIGFuZCBjb21tdW5pY2F0aW5nIHBhcnRpZXMuDQoNClN0ZWdhbm9ncmFwaHkgaW5jbHW=
ZGVzIHRoZSBjb25jZWFsbWVudCBvZiBpbmZvcm1hdGlvbiB3aXRoaW4gY29t
cHV0ZXIgZmlsZXMuIEluIGRpZ2l0YWwgc3RlZ2Fub2dyYXBoeSwgZWxlY3Ryb25pYyBjb21tdW5pY2F0aW9u
cyBtYXkgaW5jbHVkZSBzdGVnYW5vZ3JhcGhpYyBjb2RpbmcgaW5zaZ==
ZGUgb2YgYSB0cmFuc3BvcnQgbGF5ZXIsIHN1Y2ggYXMgYSBkb2N1bWVudCBmaWxlLCBpbWFnZSBmaWx=
ZSwgcHJvZ3JhbSBvciBwcm90b2NvbC4gTWVkaWEg
ZmlsZXMgYXJlIGlkZWFsIGZvciBzdGVnYW5vZ3JhcGhpYyB0cmFuc21pc3Npb+==
biBiZWNhdXNlIG9mIHRoZWlyIGxhcmdlIHNpemUuIEFzIB==
YSBzaW1wbGUgZXhhbXBsZSwgYSBzZW5kZXIgbWlnaHQgc3RhcnQgd2l0aCBh
biBpbm5vY3VvdXMgaW1hZ2UgZmlsZSBhbmQgYWRqdXN0IHRoZSBjb2xvciBvZiBldmVyeSAxMDB0aCBwaXhlbCD=
dG8gY29ycmVzcG9uZCB0byBhIGxldHRlciBpbiB0aGUgYWxwaGFiZXQsIGF=
IGNoYW5nZSBzbyBzdWJ0bGUgdGhhdCBzb21lb25lIG5vdCBzcGVjaWZpY2FsbHkgbG9va2luZyBm
b3IgaXQgaXMgdW5saWtlbHkgdG8gbm90aWNlIGl0Lg0KDQpUaGU=
IGZpcnN0IHJlY29yZGVkIHVzZXMgb2Ygc3RlZ2Fub2dyYXBoeSBjYW4gYmUgdHJ=
YWNlZCBiYWNrIHRvIDQ0MCBCQyB3aGVuIEhlcm9kb3R1cyBtZW50aW9ucyB0d28gZXhhbXBsZXMgb+==
ZiBzdGVnYW5vZ3JhcGh5IGluIFRoZSBIaXN0b3JpZXMgb2Yg
SGVyb2RvdHVzLiBEZW1hcmF0dXMgc2VudCBhIHdhcm5pbmcgYWJvdXQgYSB=
Zm9ydGhjb21pbmcgYXR0YWNrIHRvIEdyZWVjZSBieSB3
cml0aW5nIGl0IGRpcmVjdGx5IG9uIHRoZSB3b29kZW4gYmFja2luZyBvZiBhIHdheCB0YWJsZXQgYmVm
b3JlIGFwcGx5aW5nIGl0cyBiZWVzd2F4IHN1cmZhY2UuIFdheCB0YWJsZXRzIHdlcmUgaW4gY29tbW9uIHVzZV==
IHRoZW4gYXMgcmV1c2FibGUgd3JpdGluZyBzdXJmYWNlcywgc29tZXRpbWX=
cyB1c2VkIGZvciBzaG9ydGhhbmQuIEFub3RoZXIgYW5jaWVudCBleGFtcGxlIGlzIHRoYXQgb9==
ZiBIaXN0aWFldXMsIHdobyBzaGF2ZWQgdGhlIGhlYWQgb2YgaGlzIG1vc3QgdHJ1c3RlZCBz
bGF2ZSBhbmQgdGF0dG9vZWQgYSBtZXNzYWdlIG9uIGl0LiBBZnRlciBoaXMgaGFpciBoYWQgZ5==
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IGluc3RpZ2F0ZSBhIHJldm9sdCBhZ2FpbnN0IHRoZSBQZXJzaWFucy4NCg0KU3RlZ2Fub2dyYXBoeSBoYXMgYm==
ZWVuIHdpZGVseSB1c2VkLCBpbmNsdWRpbmcgaW4gcmVjZW50IGhpc3RvcmljYWwgdGltZXMgYW5kIIHT=
aGUgcHJlc2VudCBkYXkuIFBvc3NpYmxlIHBlcm11dGF0aW9ucyBhcmUgZW5kbGVzcyBhbmT=
IGtub3duIGV4YW1wbGVzIGluY2x1ZGU6DQoqIEhpZGRlbiBtZXNzYWdlcyB3aXRoaW4gd2F4IHRh
YmxldHM6IGluIGFuY2llbnQgR3JlZWNlLCBwZW9wbGUgd3JvdGUgbWV=
c3NhZ2VzIG9uIHRoZSB3b29kLCB0aGVuIGNvdmVyZWQgaXQgd2l0aCB3YXggdXBvbiB3aGljaCBhbiBpbm5vY2Vu
dCBjb3ZlcmluZyBtZXNzYWdlIHdhcyB3cml0dGVu
Lg0KKiBIaWRkZW4gbWVzc2FnZXMgb24gbWVzc2VuZ2VyJ3MgYm9keTogYWxzbyB1c2VkIGluIGFuY2llbt==
dCBHcmVlY2UuIEhlcm9kb3R1cyB0ZWxscyB0aGUgc3Rvcnkgb1==
ZiBhIG1lc3NhZ2UgdGF0dG9vZWQgb24gYSBzbGF2ZSdzIHNoYXZlZCBoZWFkLCBoaWRkZW4gYnkgdGhl
IGdyb3d0aCBvZiBoaXMgaGFpciwgYW5kIGV4cG9zZWQgYnkgc2hhdmluZyBoaXMgaGVhZM==
IGFnYWluLiBUaGUgbWVzc2FnZSBhbGxlZ2VkbHkgY2FycmllZCBhIHdhcm5pbmcgdG8gR3JlZWNlIGFib5==
2/2
dXQgUGVyc2lhbiBpbnZhc2lvbiBwbGFucy4gVGh=
aXMgbWV0aG9kIGhhcyBvYnZpb3VzIGRyYXdiYWNrcyz=
IHN1Y2ggYXMgZGVsYXllZCB0cmFuc21pc3Npb24gd2hpbGUgd2FpdGluZyBmb3IgdGhlIHP=
bGF2ZSdzIGhhaXIgdG8gZ3JvdywgYW5kIHRoZSByZXN0cmljdGlvbnMgb3==
biB0aGUgbnVtYmVyIGFuZCBzaXplIG9mIG1lc3M=
YWdlcyB0aGF0IGNhbiBiZSBlbmNvZGVkIG9uIG9uZSBwZXJzb24=
J3Mgc2NhbHAuDQoqIEluIFdXSUksIHRoZSBGcmVuY2ggUmVzaXN0YW5jZSBzZW50IHNvbWUgbWVzc2FnZXMgd2==
cml0dGVuIG9uIHRoZSBiYWNrcyBvZiBjb3VyaWVycyD=
dXNpbmcgaW52aXNpYmxlIGluay4NCiogSGlkZGVuIG1lc3NhZ2VzIG9uIHBhcGVyIHdy
aXR0ZW4gaW4gc2VjcmV0IGlua3MsIHVuZGVyIG90aGVyIG1lc3NhZ2Vz
IG9yIG9uIHRoZSBibGFuayBwYXJ0cyBvZiBvdGhlct==
IG1lc3NhZ2VzLg0KKiBNZXNzYWdlcyB3cml0dGVuIGluIE1vcnNlIGNvZGUgb24ga25pdHRpbmcgeWFybiBhbmQg
dGhlbiBrbml0dGVkIGludG8gYSBwaWVjZSBvZiBjbG90aGluZyB3b3K=
biBieSBhIGNvdXJpZXIuDQoqIE1lc3NhZ2VzIHdyaXR0ZW4gb24gdGhlIGJhY2sgb5==
ZiBwb3N0YWdlIHN0YW1wcy4NCiogRHVyaW5nIGFuZCBhZnRlcm==
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cm9kdWNlZCBtaWNyb2RvdHMgdG8gc2VuZCBpbmZvcm1hdGlvbiBiYWNrIGFuZH==
IGZvcnRoLiBNaWNyb2RvdHMgd2VyZSB0eXBpY2FsbHkg
bWludXRlLCBhcHByb3hpbWF0ZWx5IGxlc3MgdGhhbiB0aGUgc2l6ZSBvZiB0aGUgcGVyaW9kIHByb2R=
dWNlZCBieSBhIHR5cGV3cml0ZXIuIFdXSUkgbWljcm9kb3RzIG5lZWRlZCB0byBiZSBlbWJlZGRlZB==
IGluIHRoZSBwYXBlciBhbmQgY292ZXJlZCB3aXRoIGFuIGFkaGVzaXZlIChzdWNoIGFzIGNvbGxvZGlvbikuIFR=
aGlzIHdhcyByZWZsZWN0aXZlIGFuZCB0aHVzIGRldGVjdGFibGUg
Ynkgdmlld2luZyBhZ2FpbnN0IGdsYW5jaW5nIGxpZ2h0LiBBbHRlcm5hdGl2ZSB0ZWNobmlxdWVzIGluY2x1ZGVk
IGluc2VydGluZyBtaWNyb2RvdHMgaW50byBzbGl0cyBjdXQgaW50byB0aGUgZWRnZSBvZv==
IHBvc3QgY2FyZHMuDQoqIER1cmluZyBXb3JsZCBXYXIgSUksIGEgc3B5IGZvciB=
SmFwYW4gaW4gTmV3IFlvcmsgQ2l0eSwgVmVsdmFsZWW=
IERpY2tpbnNvbiwgc2VudCBpbmZvcm1hdGlvbiB0byBhY2NvbW1vZGF0aW9=
biBhZGRyZXNzZXMgaW4gbmV1dHJhbCBTb3V0aCBBbWVyaWO=
YS4gU2hlIHdhcyBhIGRlYWxlciBpbiBkb2xscywgYW5kIG==
aGVyIGxldHRlcnMgZGlzY3Vzc2VkIGhvdyBtYW55IG9mIHRoaXMgb3IgdGhhdCBkb2xs
IHRvIHNoaXAuIFRoZSBzdGVnb3RleHQgd2FzIHRoZSBkb2xsIG9yZGVycywgd2hpbGUgdGhl
IGNvbmNlYWxlZCAicGxhaW50ZXh0IiB3YXMgaXRzZWxmIGVuY2+=
ZGVkIGFuZCBnYXZlIGluZm9ybWF0aW9uIGFib3V0IHNoaXAgbW92ZW1lbnRzLF==
IGV0Yy4gSGVyIGNhc2UgYmVjYW1lIHNvbWV3aGF0IGZh
bW91cyBhbmQgc2hlIGJlY2FtZSBrbm93biBhcyB0aGX=
IERvbGwgV29tYW4uDQoqIENvbGQgV2FyIGNvdW50
ZXItcHJvcGFnYW5kYS4gSW4gMTk2OCwgY3JldyBtZW1iZW==
cnMgb2YgdGhlIFVTUyBQdWVibG8gKEFHRVItMikgaW50ZWxsaWdlbmNlIHNoaXAgaGVsZCBhcyBwcm==
aXNvbmVycyBieSBOb3J0aCBLb3JlYSwgY29tbXVuaWNhdGVkIGluIHNpZ25=
IGxhbmd1YWdlIGR1cmluZyBzdGFnZWQgcGhvdG8gb3Bwb3J0
dW5pdGllcywgaW5mb3JtaW5nIHRoZSBVbml0ZWQgU3RhdGVzIHRoZXkg
d2VyZSBub3QgZGVmZWN0b3JzIGJ1dCByYXRoZXIgd2VyZSBiZWluZyBoZWxkIGNh
cHRpdmUgYnkgdGhlIE5vcnRoIEtvcmVhbnMuIEluIG90aGVyIHBob3Rv
cyBwcmVzZW50ZWQgdG8gdGhlIFVTLCBjcmV3IG1lbWJlcnMgZ2F2ZSAidGhlIGZpbmdlciIgdG8g
dGhlIHVuc3VzcGVjdGluZyBOb3J0aCBLb3JlYW5zLCBpbiBhbiBhdHRlbXB0IHRvIE==
ZGlzY3JlZGl0IHBob3RvcyB0aGF0IHNob3dlZCB0aGVtIHNtaQ==
bGluZyBhbmQgY29tZm9ydGFibGUuDQoNCi0tDQpodHRwOi8vZW4ud2lraXBlZGlhLm9yZw==
L3dpa2kvU3RlZ2Fub2dyYXBoeQ0K'''
e=d.splitlines()
binstr=""
base64="ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz0123456789+/"
```
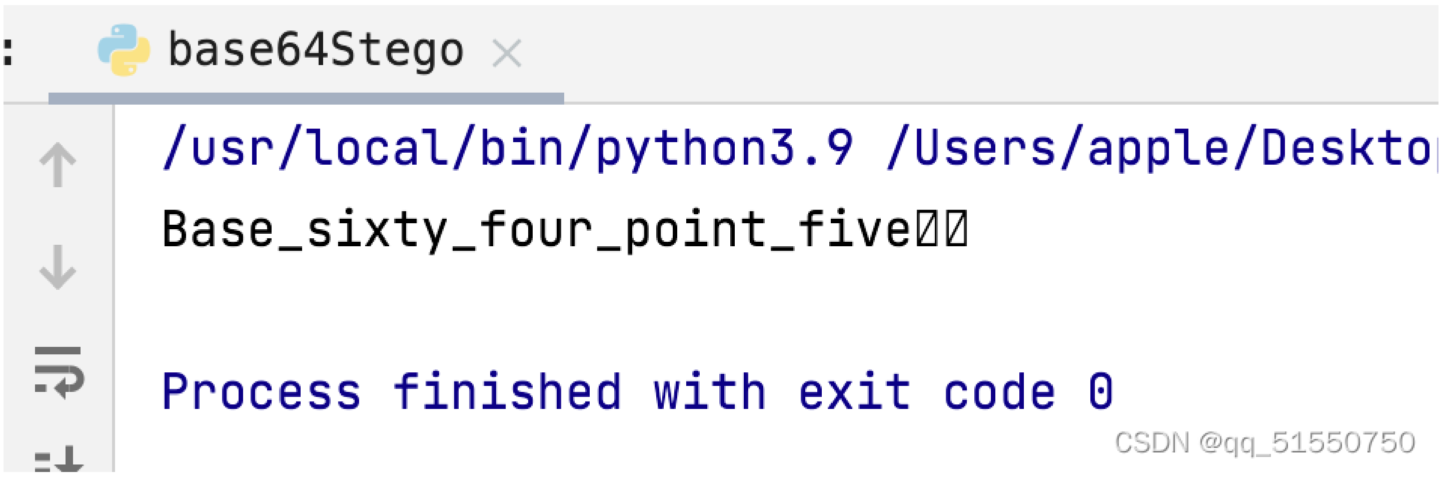

```
for i in e :
    if i.find("==")>0:
        temp=bin((base64.find(i[-3])&15))[2:]
    #取倒数第3个字符，在base64找到对应的索引数（就是编码数），取低4位，再转换为二进制字符
        binstr=binstr + "0"*(4-len(temp))+temp #二进制字符补高位0后，连接字符到binstr
    elif i.find("=")>0:
        temp=bin((base64.find(i[-2])&3))[2:] #取倒数第2个字符，在base64找到对应的索引数（就是编码数），取低2位，再转换为二进制字符
        binstr=binstr + "0"*(2-len(temp))+temp #二进制字符补高位0后，连接字符到binstr
str=""
for i in range(0,len(binstr),8):
    str=str+chr(int(binstr[i:i+8],2)) #从左到右，每取8位转换为ascii字符，连接字符到字符串
print(str) #结果是 Base_sixty_four_point_five转换为
```

输出：



```
/usr/local/bin/python3.9 /Users/apple/Deskto
Base_sixty_four_point_five��

Process finished with exit code 0
```

得到flag就是flag{Base_sixty_four_point_five}

总结

base64隐写解密，以后碰到直接用脚本，先成为脚本小子（小白没办法）