

## basic-mod2

### Description

A new modular challenge!

Download the message [here](#).

Take each number mod 41 and find the modular inverse for the result. Then map to the following character set: 1-26 are the alphabet, 27-36 are the decimal digits, and 37 is an underscore.

Wrap your decrypted message in the picoCTF flag format (i.e. `picoCTF{decrypted_message}`)

Seems doable

The message :

```
File Edit View
268 413 438 313 426 337 272 188 392 338 77 332 139 113 92 239 247 120 419 72 295 190 131 |
```

mod41'd it right away, and got this :

**22 3 28 26 16 9 26 24 23 10 36 4 16 31 10 34 1 38 9 31 8 26 8**

( Decided to perhaps not take the stress to mod41 each number and note it manually, instead convert them all at once, did that using on the same online python compiler with a nooby aah code :

```
main.py  [Icons] Save Run Shell
1 # Online Python compiler (interpreter) to run Python online.
2 # Write Python 3 code in this online editor and run it.
3 l = [268, 413, 438, 313, 426, 337, 272, 188, 392, 338, 77, 332, 139, 113, 92, 239,
      247, 120, 419, 72, 295, 190, 131]
4 ans = ""
5 for i in l:
6     ans += str(i%41)+" "
7
8 print(ans)
```

)

Now to find their modular inverses

Saw this on the hint :

The inverse modulo  $z$  of  $x$  is the  
number,  $y$  that when multiplied by  
 $x$  is 1 modulo  $z$

Saw this too

It's recommended to use a tool to  
find the modular inverses

So I reached <https://www.omnicalculator.com/math/inverse-modulo>

We look for  $x$  such that:

$$a * x = 1 \text{ mod } m$$

a	22
m	41

Your equation:  $22 * x = 1 \text{ mod } 41$

Solution:  $x = 28$

Did the above for all the mod41'd numbers and got this :

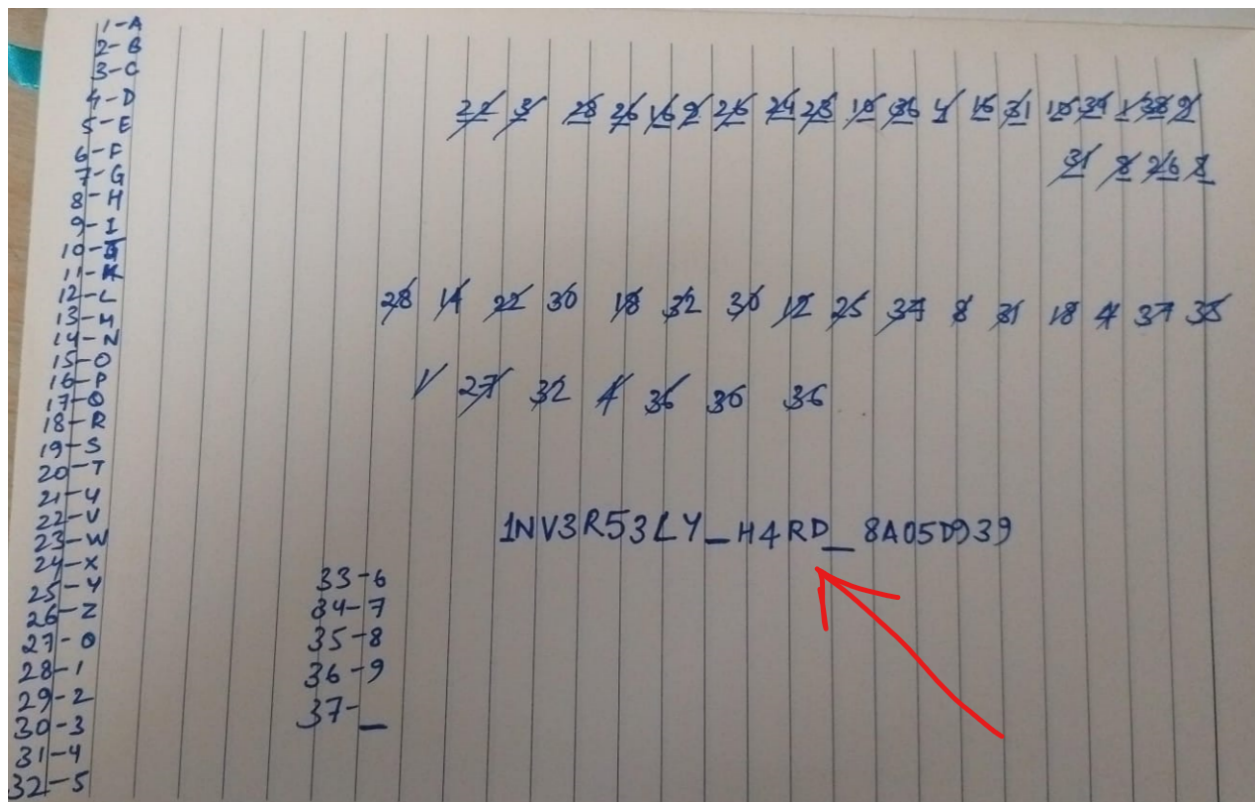
28 14 22 30 18 32 30 12 25 37 8 31 18 4 37 35 1 27 32 4 36 30 36

( found the inverses on the site, and noted the x's down on a notebook )

Now to map the above according to this :

**1-26 are the alphabet, 27-36 are the decimal digits, and 37 is an underscore.**

looks reall promising :



Typed in- **picoCTF{1NV3R53LY\_H4RD\_8A05D939}**

lesgoo

Hurray! You earned  
100 points. X