## Author : Jayesh Jaiswal; Atharva Gawas.

## Title : Unfolded

## Git-Hub Links :

https://github.com/Jayesh-2003

https://github.com/ATHARVA-GAWAS

## Category : Cryptography

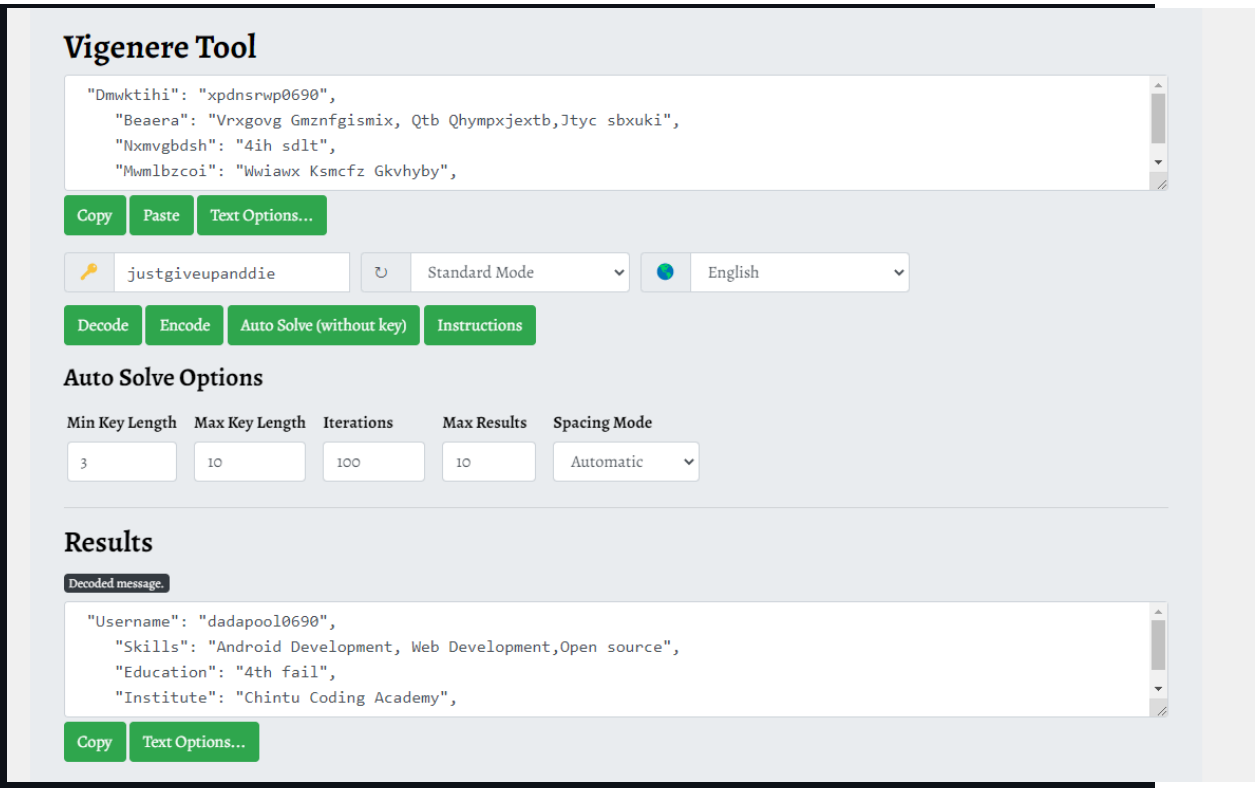
## Description : My Friend Giovan Battista Bellaso was original creator but people didn't acknowledge him.

## Flag : VishwaCTF{0r1g4m1_1s_4n_4rt_856462584532}

1. Open the file Step1.json
2. In the description, we are given "My Friend Giovan Battista Bellaso was original creator but people didn't acknowledge him".This implies it is vigenere cipher.
3. In the Step1.json file, we are provided with ciphered text

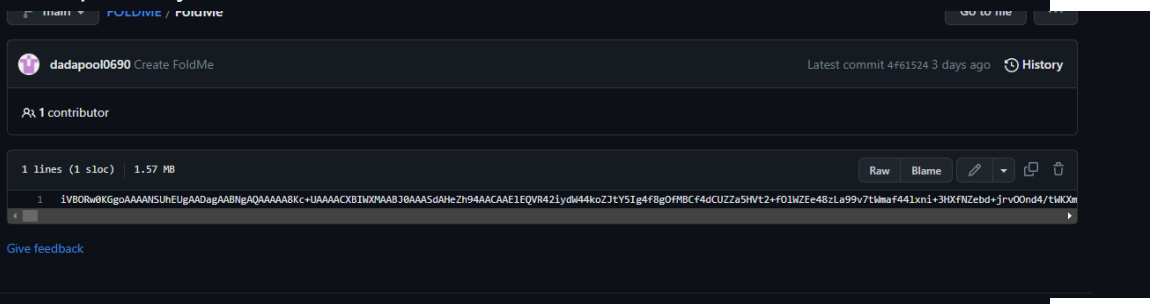
```
{
    "Dmwktihi": "xpdnsrwp0690",
    "Beaera": "Vrxgovg Gmznfgismix, Qtb Qhympxjextb,Jtyc sbxuki",
    "Nxmvgbdsh": "4ih sdlt",
    "Mwmlbzcoi": "Wwiawx Ksmcfz Gkvhyby",
    "Key": "justgiveupanddie"
}
```

4.
5. Decode the text using vigenere cipher tool, also we are provided with the key.

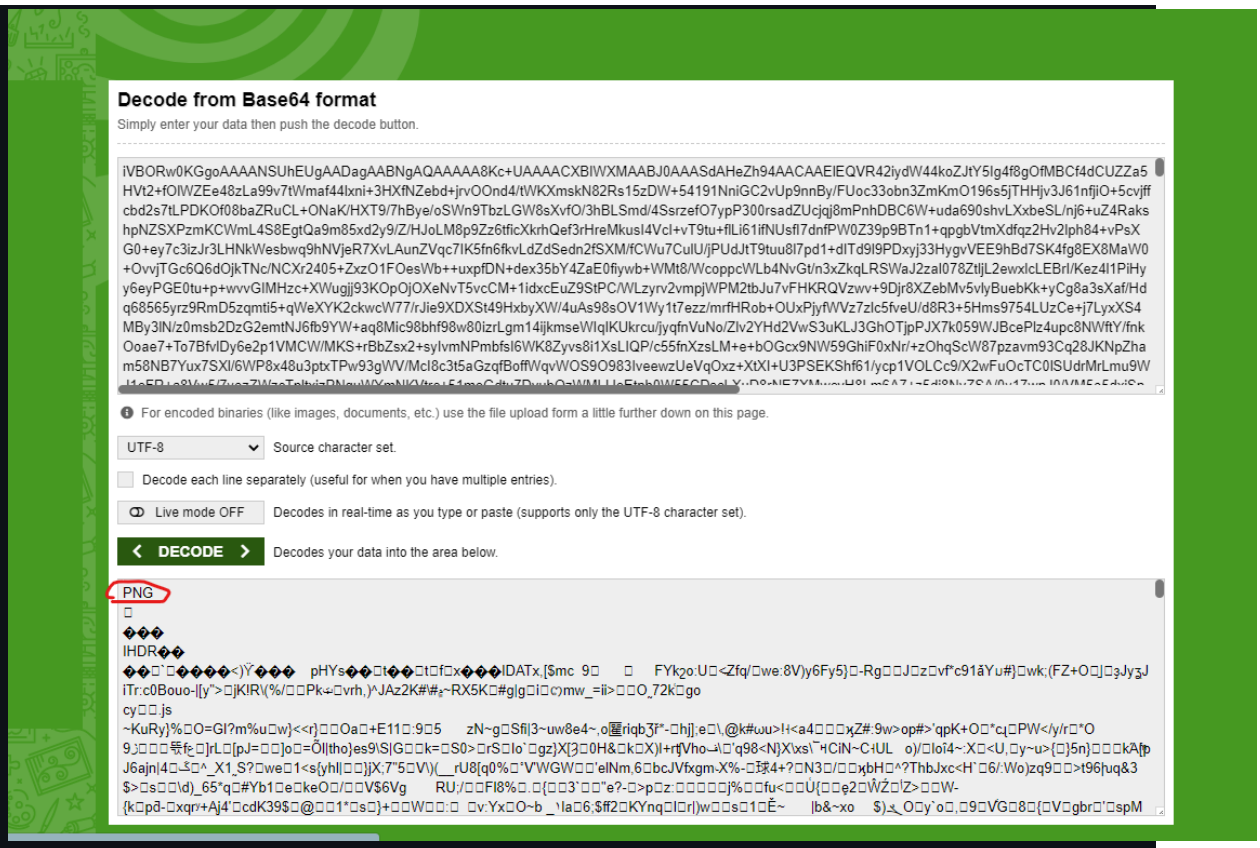
6. 

7. Upon decoding, we get the profile of a person, it appears to be like a github repository.
8. So now, search the profile on github

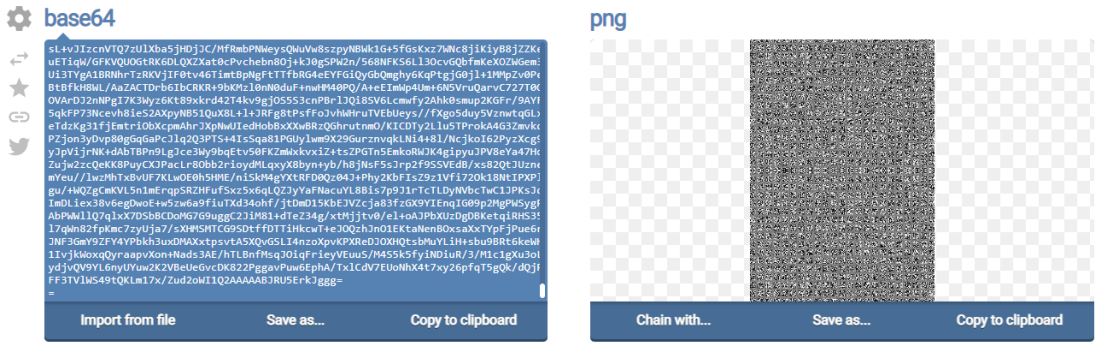

9.
10. We get a repository named "fold me".
11. Check the repository



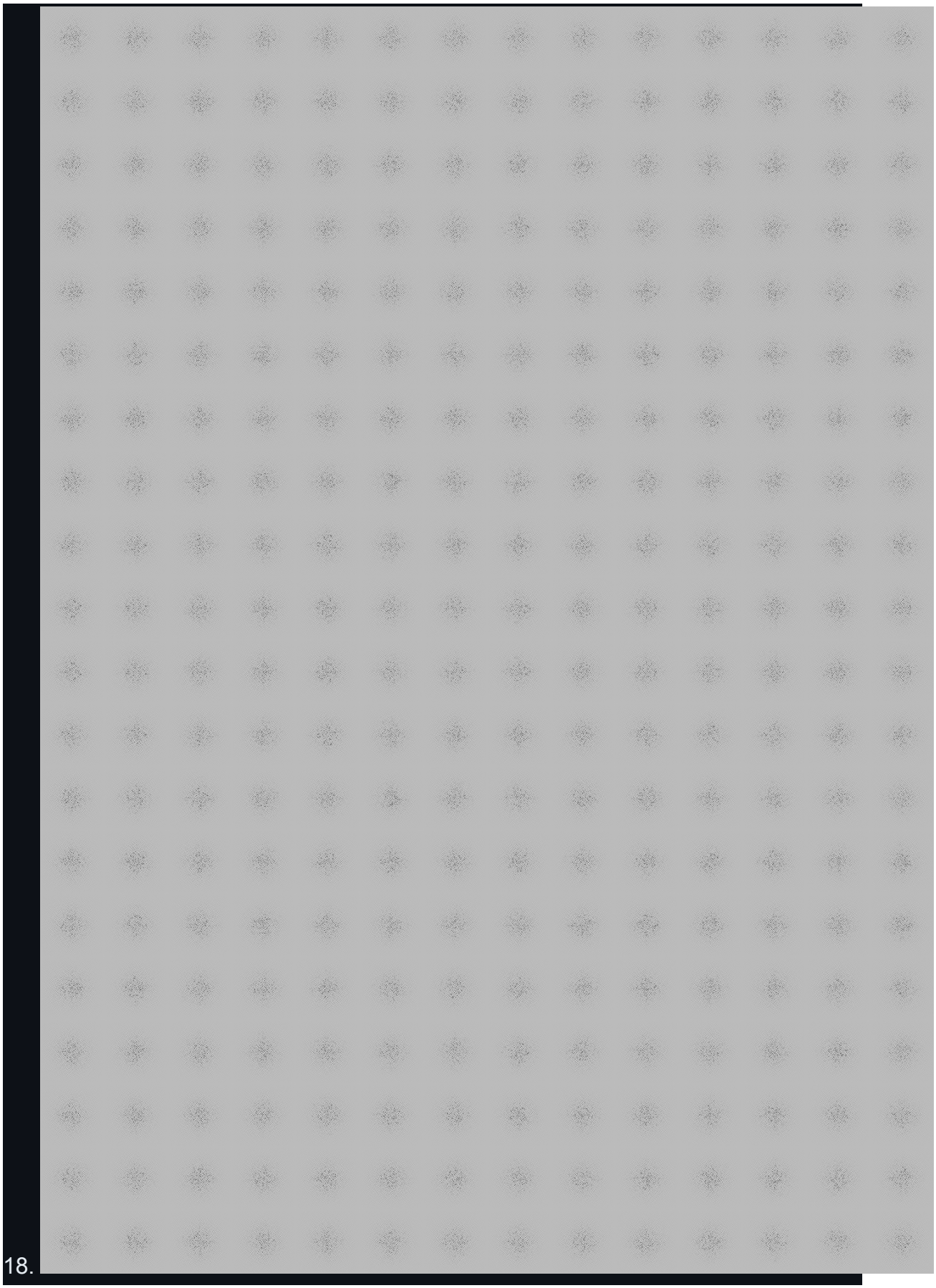

12.
13. We get a base64 like code, we need to decode it.

14. 


15. Upon decoding, it appears to be a png file, so we need to decode the base64 code to png file directly using an online tool

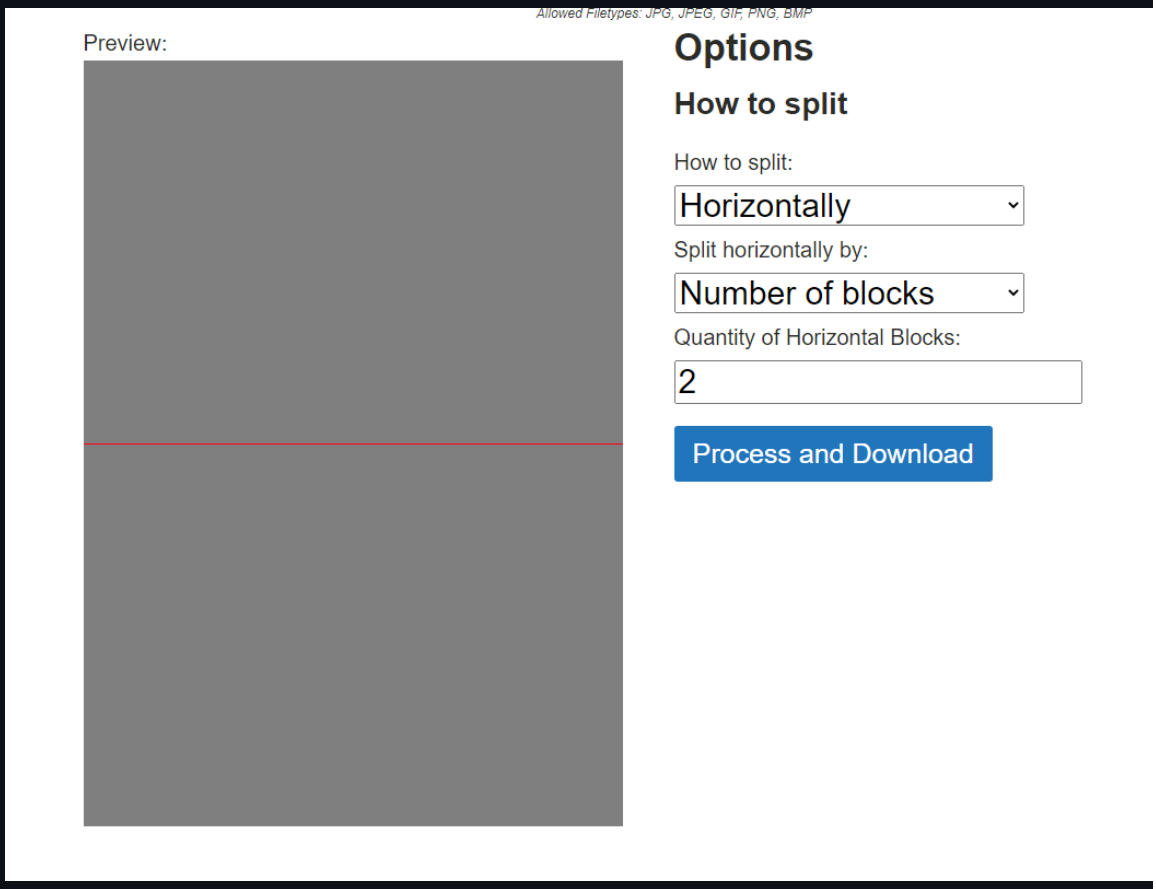
16. 


17. Now, download the resulting image and analyze it.

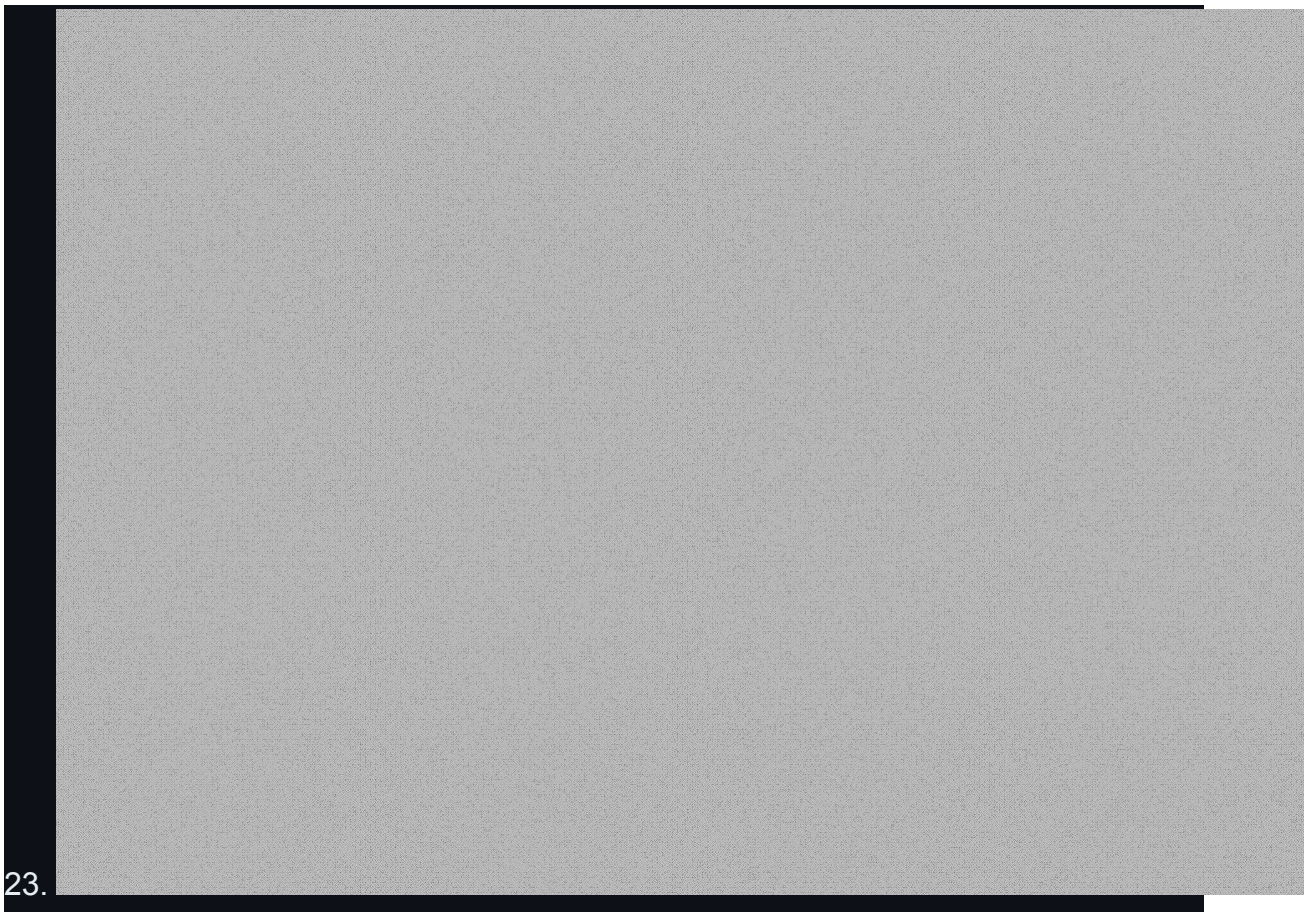


18.

19. We are given a hint to fold the image as "fold me", just like a paper.
20. We split the image into half horizontally.




21.
22. The images are

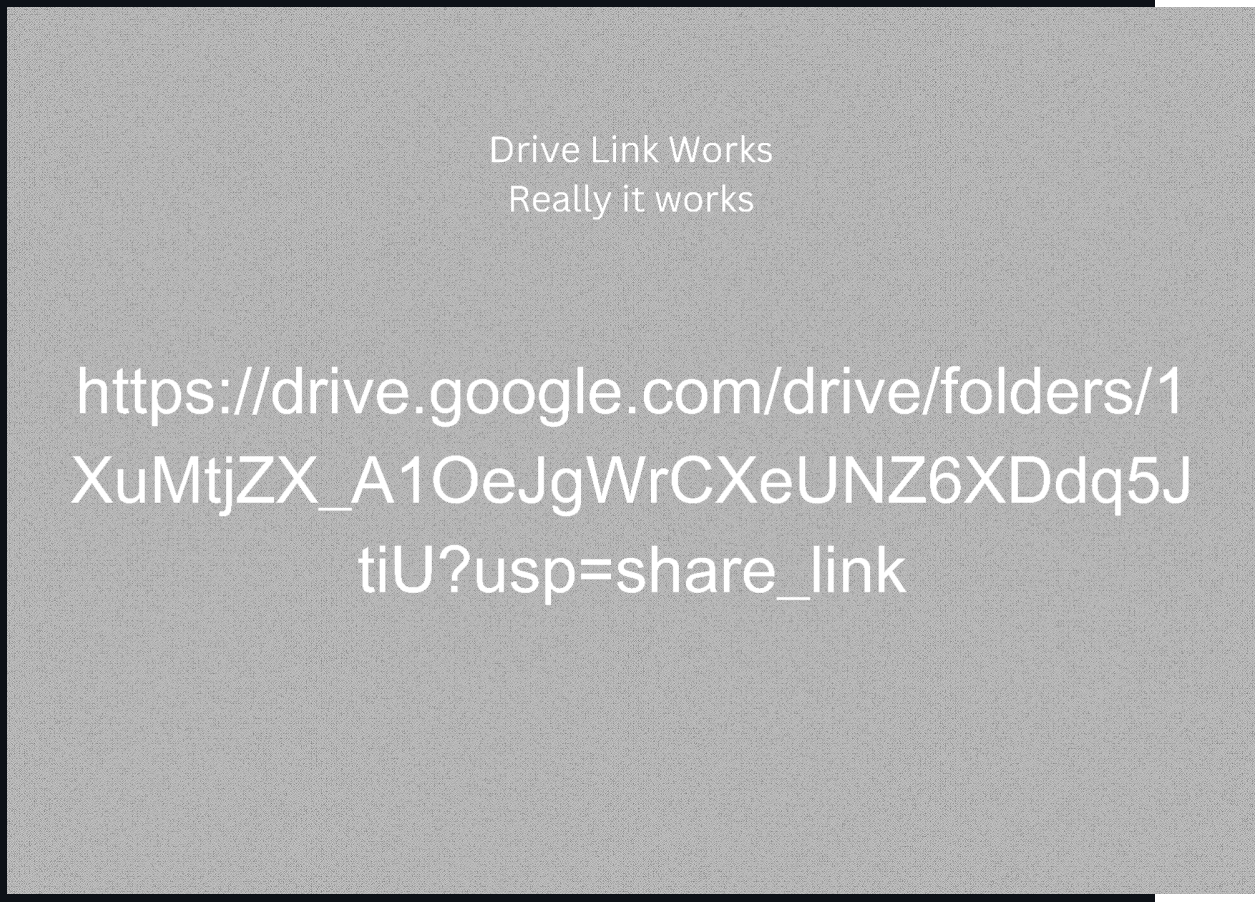
23. 

24. 
25. Now flip the lower image vertically.
26. The flipped image is

Now write a code based on principle of solving visual cryptography in python

```
from PIL import Image

# Load the first share
share1 = Image.open("img1.png").convert('1')

# Load the second share
share2 = Image.open("img2flip.png").convert('1')

# Get the size of the shares
width, height = share1.size

# Create a new image for the result
result = Image.new("1", (width, height))

# Loop through each pixel in the shares and combine them
for x in range(width):
    for y in range(height):
        pixel1 = share1.getpixel((x, y))
        pixel2 = share2.getpixel((x, y))

        # If both pixels are black, set the result pixel to black
```

```
        if pixel1 == 0 and pixel2 == 0:
            result.putpixel((x, y), 0)
        # Otherwise, set the result pixel to white
        else:
            result.putpixel((x, y), 255)

# Save the resulting image
result.save("result.png")
```

29. Now the resulting image is,
30. 

31. Visit the given link but before that, remove unnecessary spaces.
32. It directs us to a drive link, it has a file flag.txt
33. So the flag is VishwaCTF{0r1g4m1_1s_4n_4rt_856462584532}