ZEAL EDUCATION SOCIETY's

ZEAL COLLEGE OF ENGINEEIRNG AND RESEARCH, NARHE, PUNE

DEPARTMENT OF COMPUTER ENGINEERING

SEMESTER-I

[A.Y. : 2022 - 2023]

CYBER SECURITY AND DIGITAL FORENSICS(410244(C))

LABORATORY MANUAL

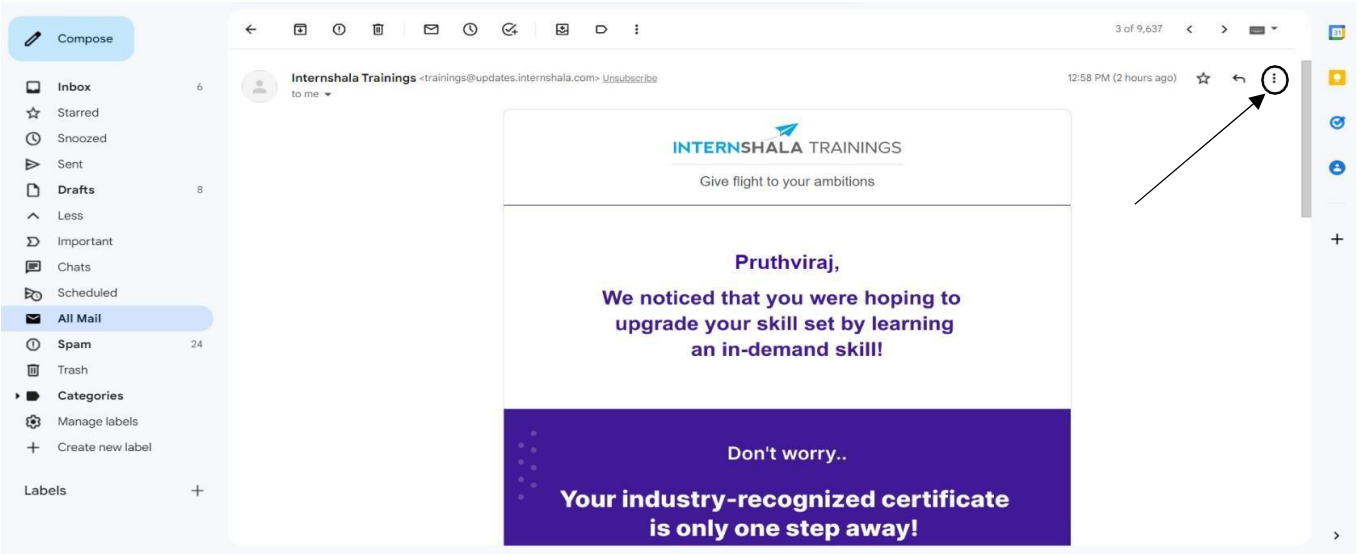
List of Assignments

Sr. No.	TITLE
	Group A
01	Write a program for tracking Emails and Investigating Email Crimes. i.e. Write a program to analyze e-mail header
02	Implement a program to generate and verify CAPTCHA image
03	Write a computer forensics application program for Recovering permanent Deleted Files and Deleted Partitions.
04	Write a program for Log Capturing and Event Correlation
05	Study of Honeypot.
	Group B
	Mini-Projects/ Case Study (Any two)
01	Mini Project- Design and develop a tool for digital forensics of images
02	Mini Project- Design and develop a tool for digital forensics of audio
03	Mini Project- Design and develop a tool for digital forensics of video
04	Mini Project- Design a system for the analysis of cyber crime using various cyber forensics techniques and compare each technique with respect to integrity, confidentiality, availability

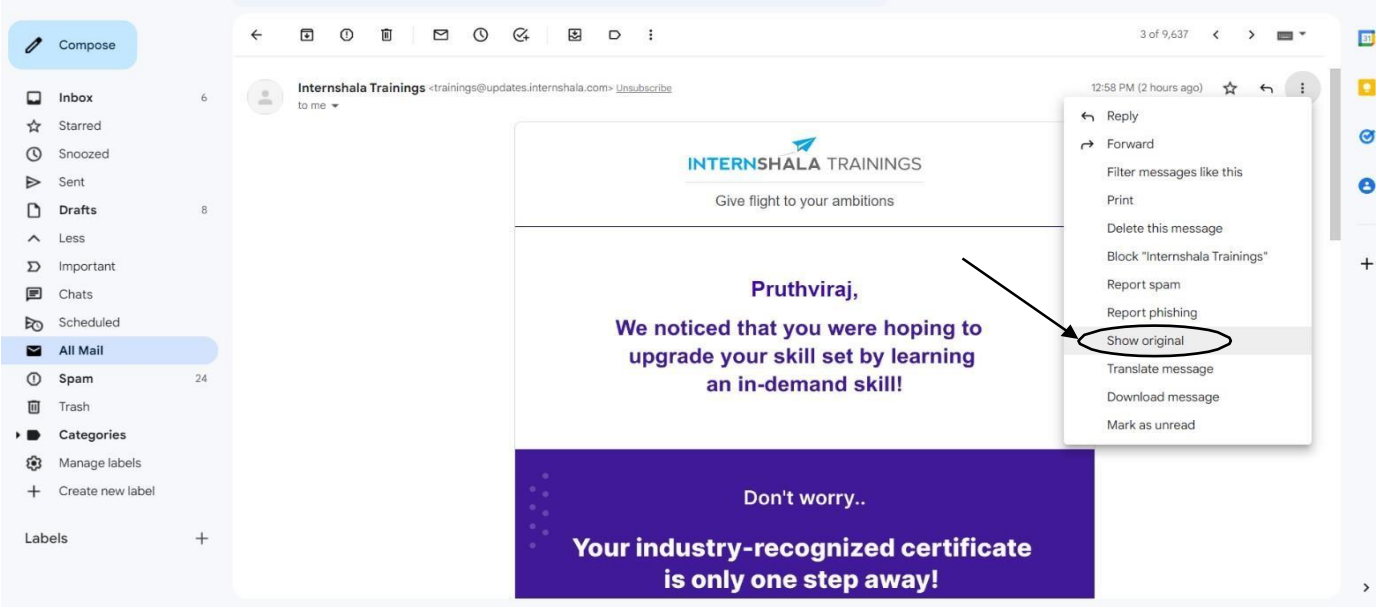
GROUP A: ASSIGNMENT NO 1

Title: Email Header Analysis

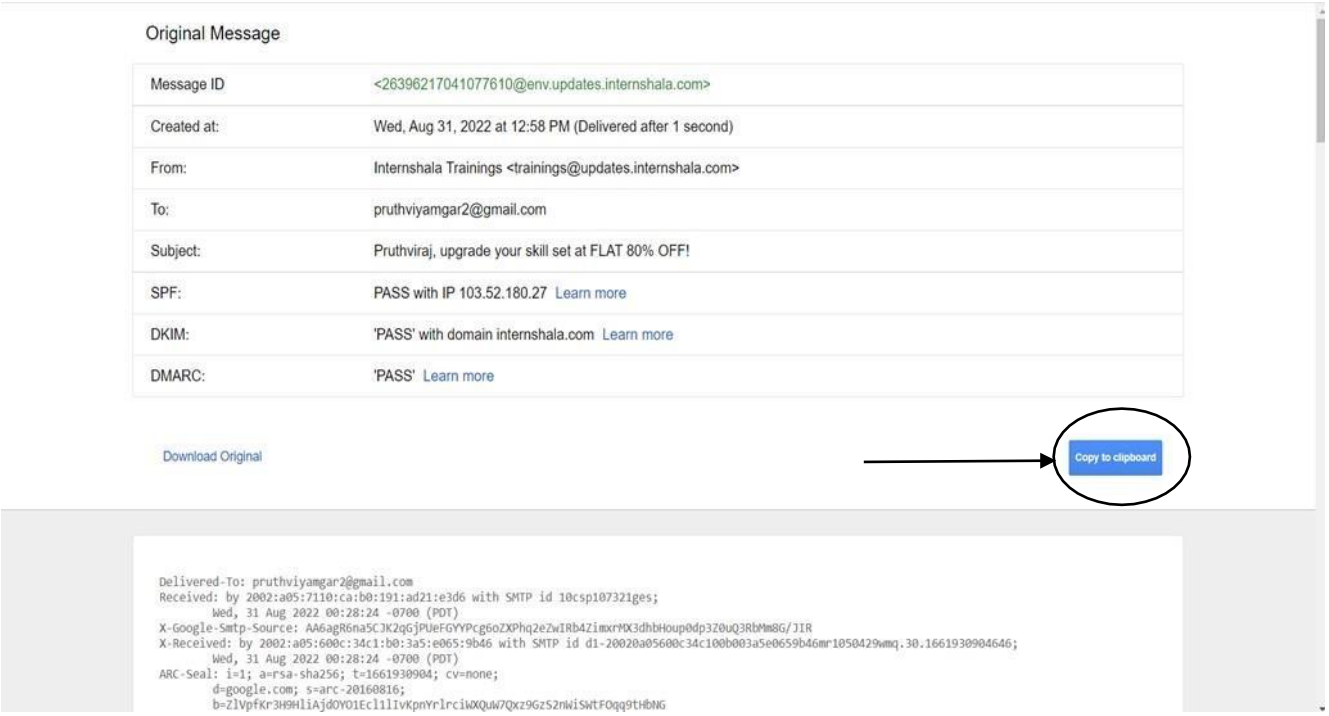
Step 1-: Open any mail from your Email-box



Step 2:- Click on show original



Step 3-: Click On Copy to Clipboard

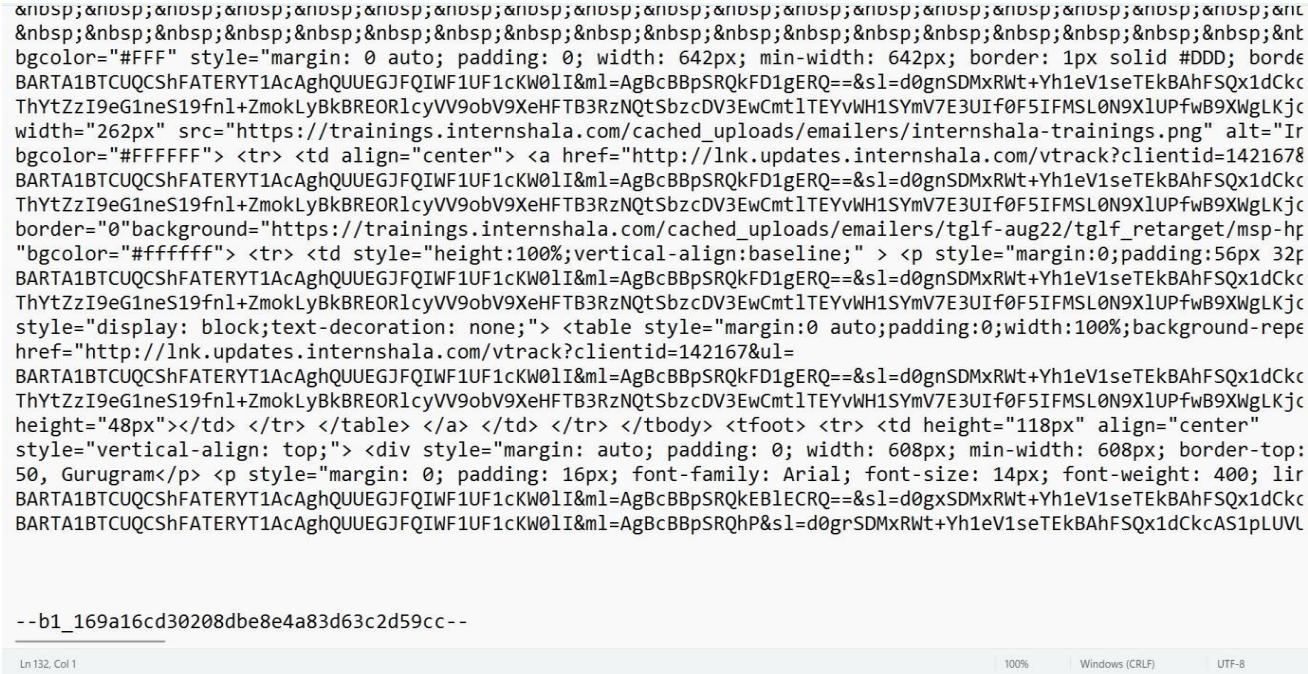


Original Message

Message ID	<26396217041077610@env.updates.internshala.com>
Created at:	Wed, Aug 31, 2022 at 12:58 PM (Delivered after 1 second)
From:	Internshala Trainings <trainings@updates.internshala.com>
To:	pruthviyamgar2@gmail.com
Subject:	Pruthviraj, upgrade your skill set at FLAT 80% OFF!
SPF:	PASS with IP 103.52.180.27 Learn more
DKIM:	'PASS' with domain internshala.com Learn more
DMARC:	'PASS' Learn more

```
Delivered-To: pruthviyamgar2@gmail.com
Received: by 2002:a05:7110:ca:b0:191:ad21:e3d6 with SMTP id 10csp107321ges;
        Wed, 31 Aug 2022 00:28:24 -0700 (PDT)
X-Google-Smtp-Source: AA6agR6na5CJK2qGjPUeFGYYPcg6oZXPhq2eZwIRb4ZimxrMX3dhbHoup0dp3Z0uQ3RbMm8G/JIR
X-Received: by 2002:a05:600c:34c1:b0:3a5:e065:9b46 with SMTP id d1-20020a05600c34c100b003a5e0659b46mr1050429wmq.30.1661930904646;
        Wed, 31 Aug 2022 00:28:24 -0700 (PDT)
ARC-Seal: i=1; a=rsa-sha256; t=1661930904; cv=none;
        d=google.com; s=arc-20160816;
        b=ZlVpfKr3H9HliAjdOYO1Ecl1lIvKpnYrlrciWXQuW7Qxz9GzS2nWiSWtFOqq9tHbNG
```

Step 4-: Open Notepad and paste the copied text here.



```
&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&n
&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&n
bgcolor="#FFF" style="margin: 0 auto; padding: 0; width: 642px; min-width: 642px; border: 1px solid #DDD; bord
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width="262px" src="https://trainings.internshala.com/cached_uploads/emailers/internshala-trainings.png" alt="I
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ThYtZzI9eG1neS19fnl+ZmokLyBkBREORlcyVV9obV9XeHFTB3RzNQtSbzcDV3EwCmtlTEYvWH1SYmV7E3UIf0F5IFMSL0N9XlUPfwB9XWgLKj
border="0"background="https://trainings.internshala.com/cached_uploads/emailers/tglf-aug22/tglf_retarget/msp-h
"bgcolor="#ffffff"> <tr> <td style="height:100%;vertical-align:baseline;" > <p style="margin:0;padding:56px 32
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style="display: block;text-decoration: none;"> <table style="margin:0 auto;padding:0;width:100%;background-rep
href="http://lnk.updates.internshala.com/vtrack?clientid=142167&ul=
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50, Gurugram</p> <p style="margin: 0; padding: 16px; font-family: Arial; font-size: 14px; font-weight: 400; li
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--b1_169a16cd30208dbe8e4a83d63c2d59cc--
```
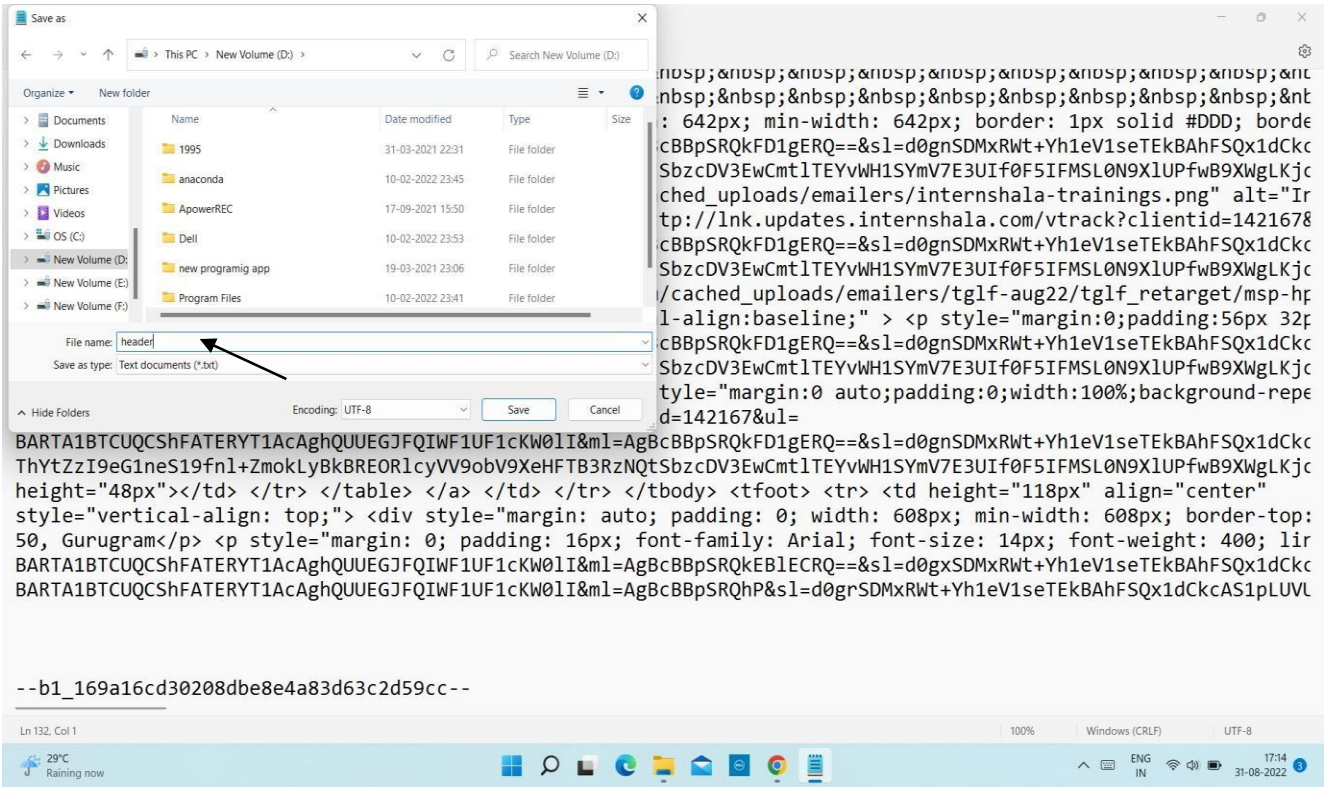
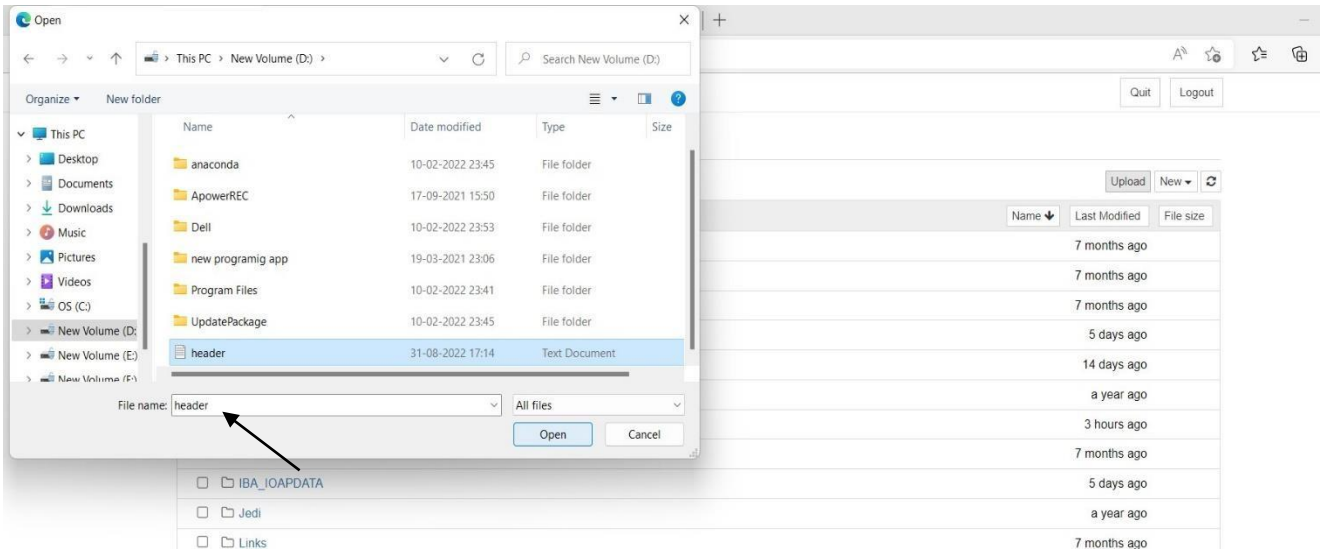
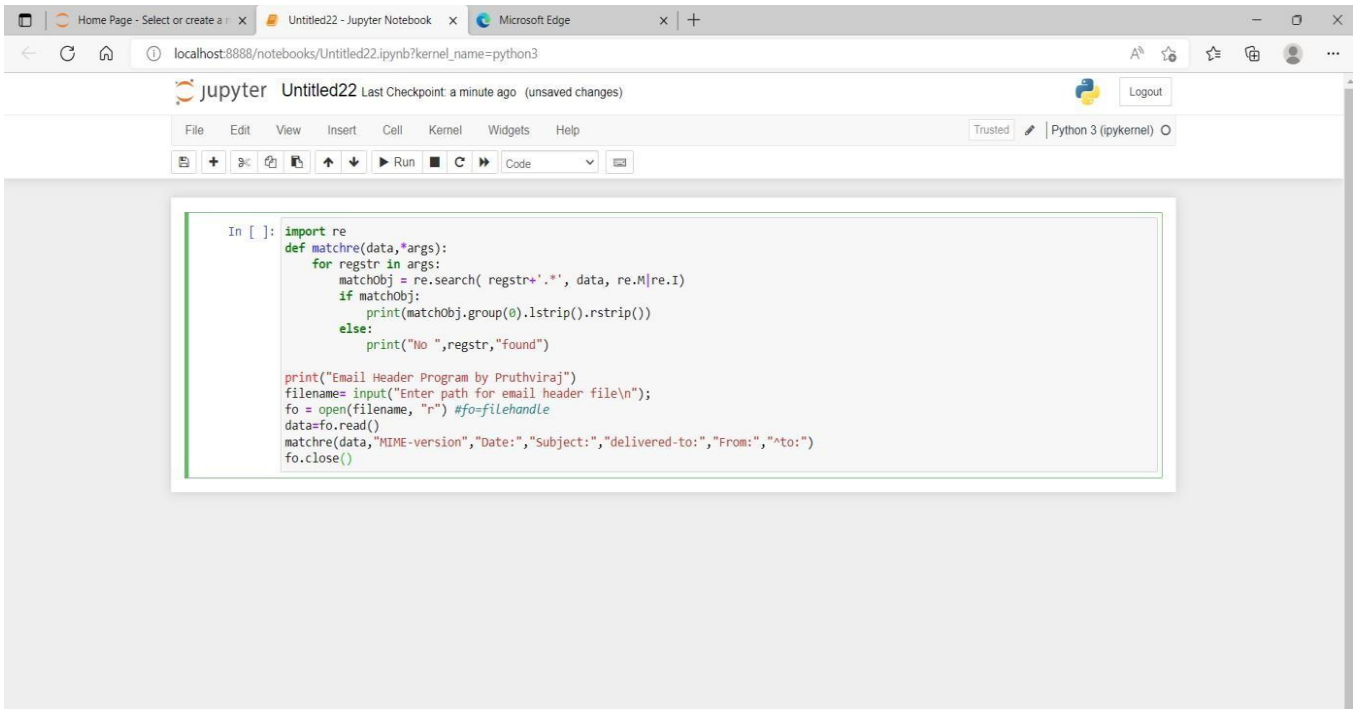

Step 5:- Save the text as header .txt file



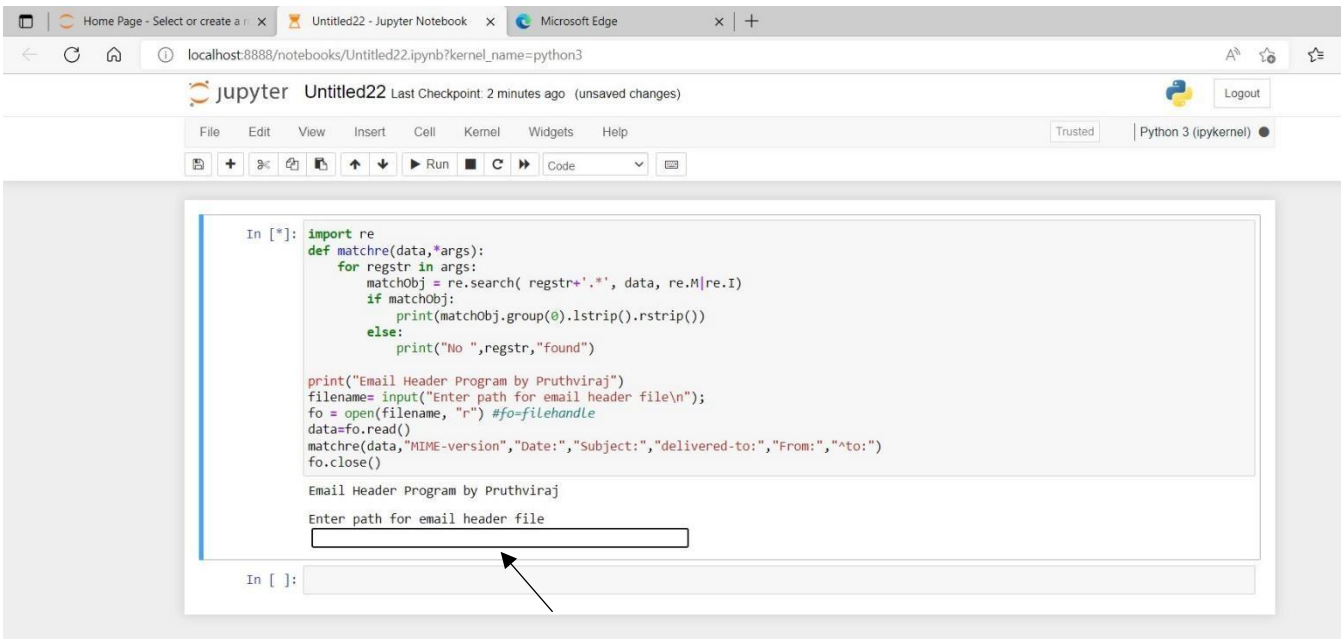
Step 6:- Go to the home page of the Jupyter notebook and upload the filesaved earlier as “header.txt”



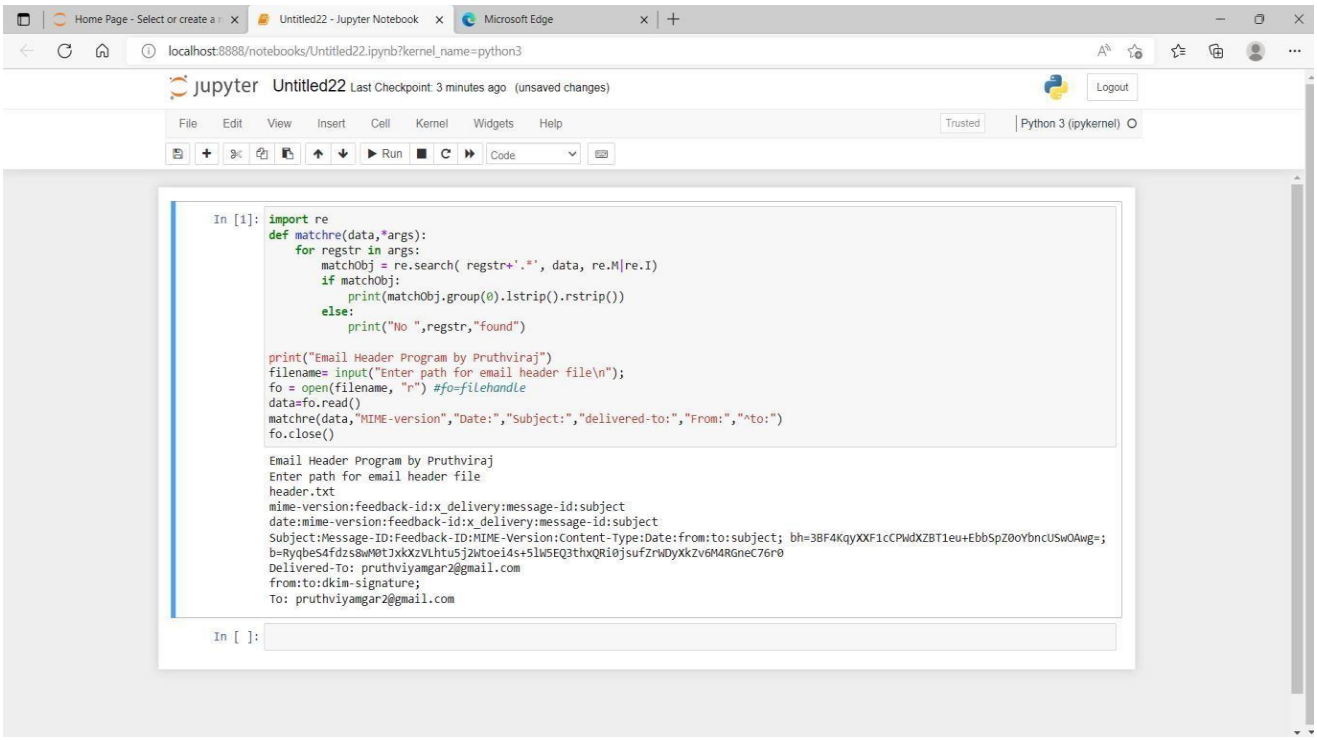
Step 7-: Open Jupyter Notebook and write the following code and run



Step 8:- Enter the filename along with extension here



Output of the Code :-



GROUP A : ASSIGNMENT NO 2

Title: - Generate and Verify CAPTCHA

Step 1-: Open Jupyter Notebook and write the following code

CyberSecurity Lab 2.ipynb

Code

```
[ ]: !pip install pil
     !pip install ipywidgets
```

```
[1]: # Importing essential libraries
     import ipywidgets as widgets
     from PIL import Image, ImageDraw, ImageFont
     import random
     import string

     def random_string_generator():
         return ''.join(random.choices(
                 string.ascii_letters + string.digits, k=6))
```

```
[2]: def create_captcha_image(random_string):
         img = Image.open('captcha.png','r')

         # Call draw Method to add 2D graphics in an image
         final_image = ImageDraw.Draw(img)

         # Custom font style and font size
         myFont = ImageFont.truetype('GoodbyeCrewelWorldNF.ttf', 65)

         # Add Text to an image
         final_image.text((30, 10), random_string, font=myFont, fill =(255, 0, 0))
         img.save("captcha_pic.png")
         img.close()
```

CyberSecurity Lab 2.ipynb

Code

```
     # Display edited image
     with open("captcha_pic.png", "rb") as file:
         image = file.read()
         return widgets.Image(
             value=image,
             format='png',
             width=300,
             height=400 )
```

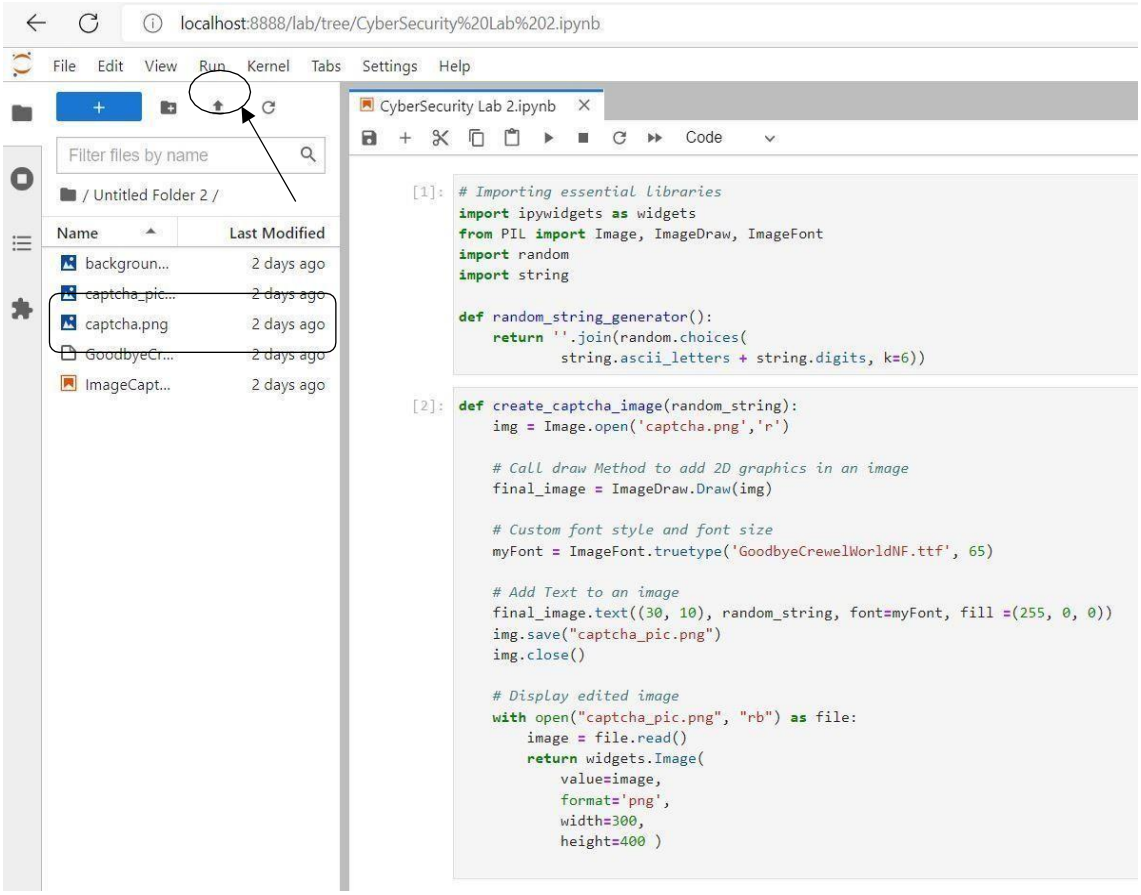
```
[ ]: random_string = random_string_generator()
```

```
[ ]: create_captcha_image( random_string )
```

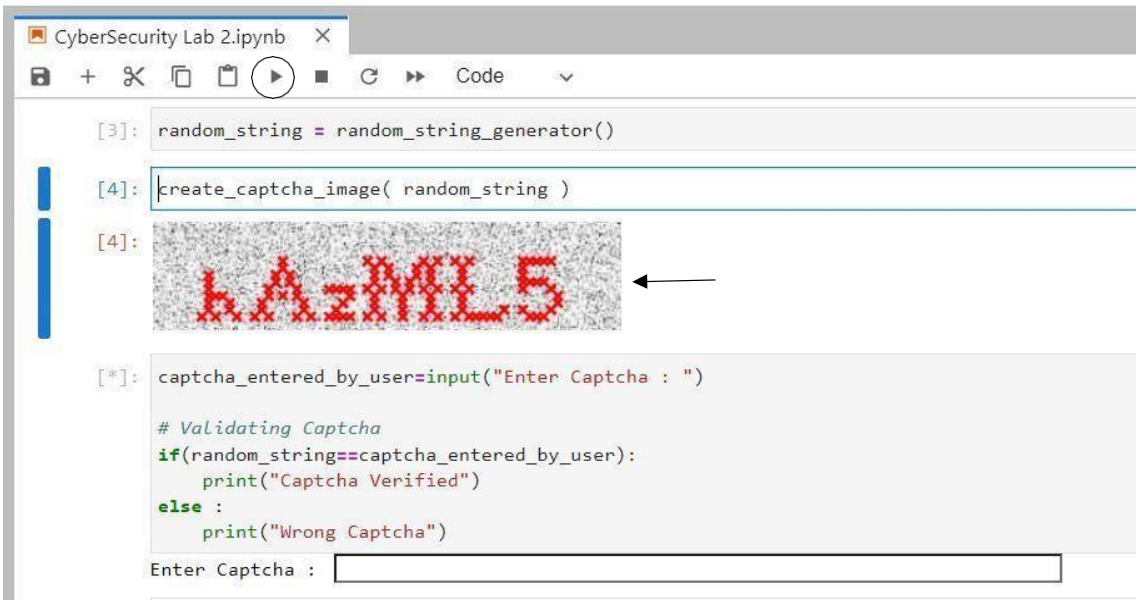
```
[ ]: captcha_entered_by_user=input("Enter Captcha : ")

     # Validating Captcha
     if(random_string==captcha_entered_by_user):
         print("Captcha Verified")
     else :
         print("Wrong Captcha")
```

Step 2-: Extract the ImageCaptcha.zip file & upload “captcha.png” and“GoodbyeCrewelWorldNF.ttf” on the Jupyter Home page

.



Step 3-: Run the code and generate captcha



Step 4:- Enter the Captcha you can see in previous block output image

CyberSecurity Lab 2.ipynb

Code

```
[3]: random_string = random_string_generator()

[4]: create_captcha_image( random_string )
```

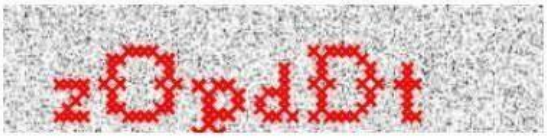
[4]:


```
[*]: captcha_entered_by_user=input("Enter Captcha : ")

     # Validating Captcha
     if(random_string==captcha_entered_by_user):
         print("Captcha Verified")
     else :
         print("Wrong Captcha")

     Enter Captcha : 7Y7EzO

[ ]:
```

Step 5-: Output when the captcha is correctly entered and validated.

```
[31]: random_string = random_string_generator()

[32]: create_captcha_image( random_string )
```

[32]:

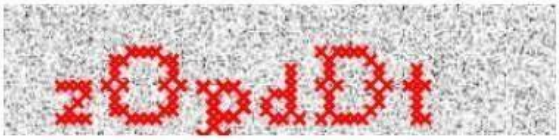



```
[33]: captcha_entered_by_user=input("Enter Captcha : ")

      # Validating Captcha
      if(random_string==captcha_entered_by_user):
          print("Captcha Verified")
      else :
          print("Wrong Captcha")

      Enter Captcha :  zOpdDt
      Captcha Verified
```

Step 6:- Output when in-corrected captcha is entered

```
[31]: random_string = random_string_generator()

[32]: create_captcha_image( random_string )
```

[32]:

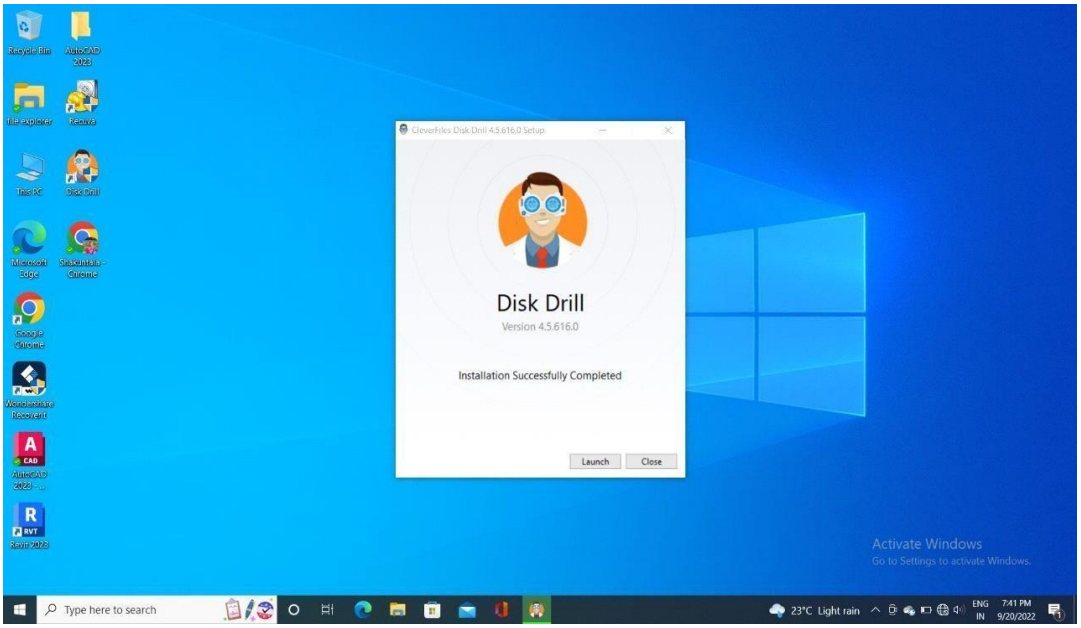


```
[34]: captcha_entered_by_user=input("Enter Captcha : ")

      # Validating Captcha
      if(random_string==captcha_entered_by_user):
          print("Captcha Verified")
      else :
          print("Wrong Captcha")

      Enter Captcha :  zopddt
      Wrong Captcha
```

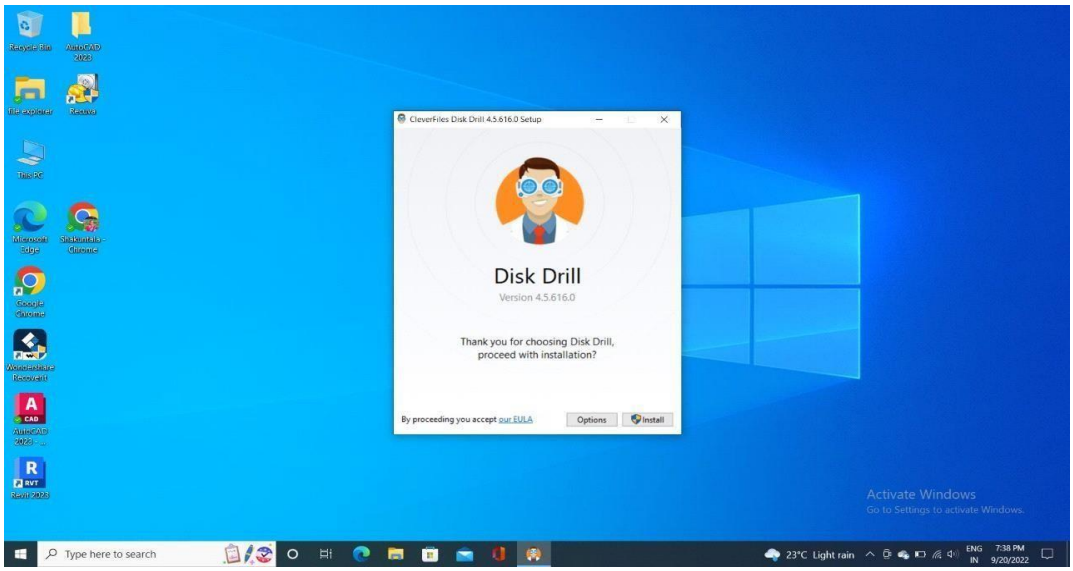
GROUP A: ASSIGNMENT NO 3

Title: -Recovering permanent Deleted Files and Deleted Partitions.

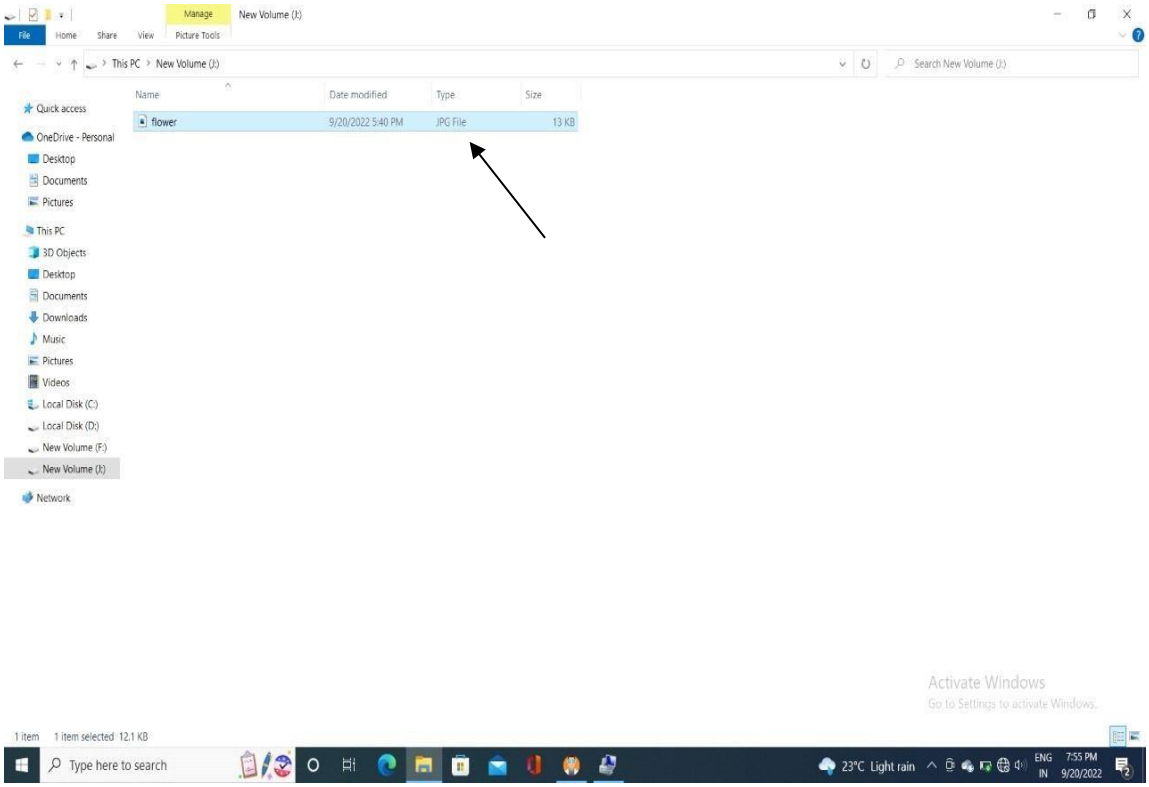
Step 1- Install the computer forensic application program (disk drill)



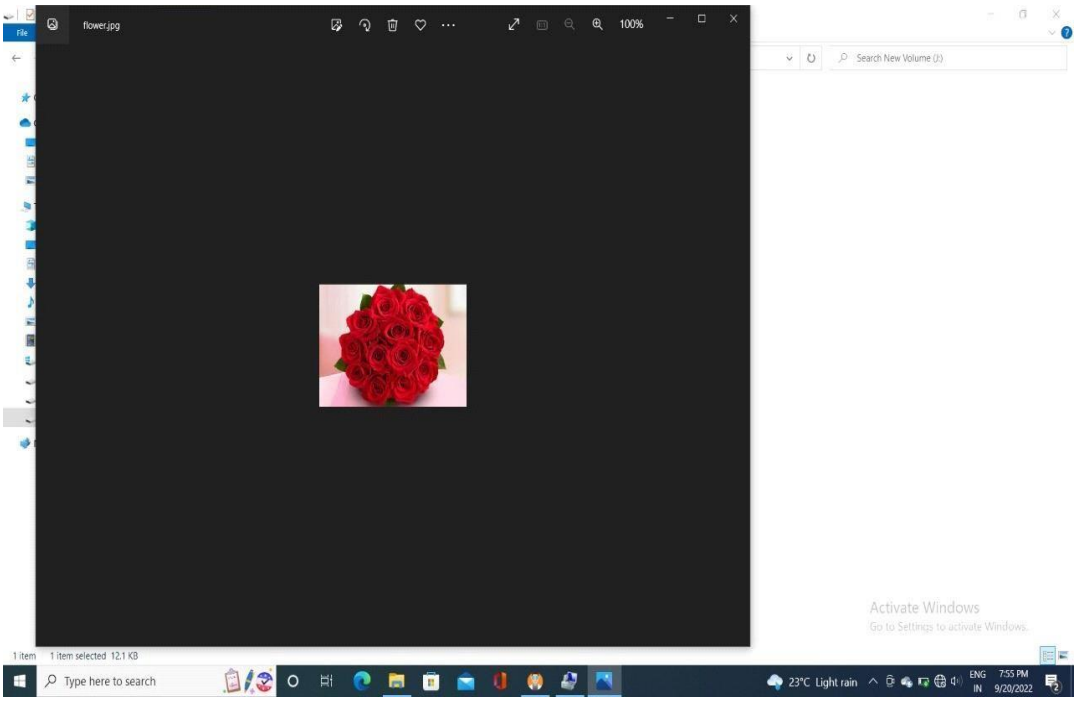
Step 2- Proceed with the Disk Drill application.



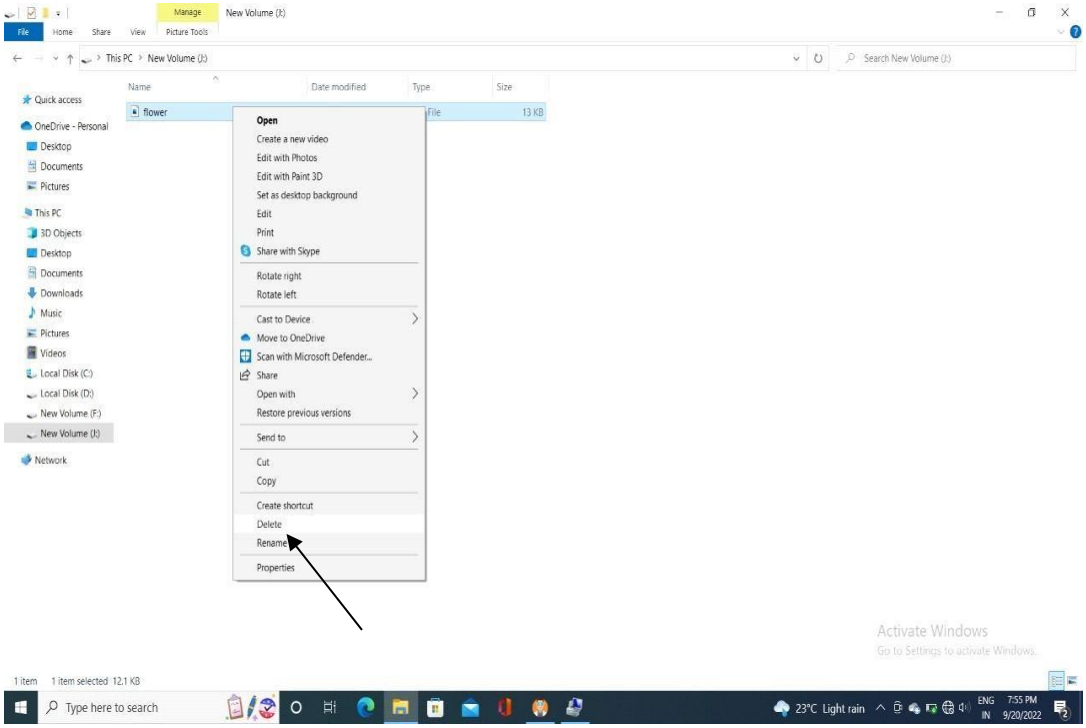
Step 3 :- Select a data/file which is to be deleted



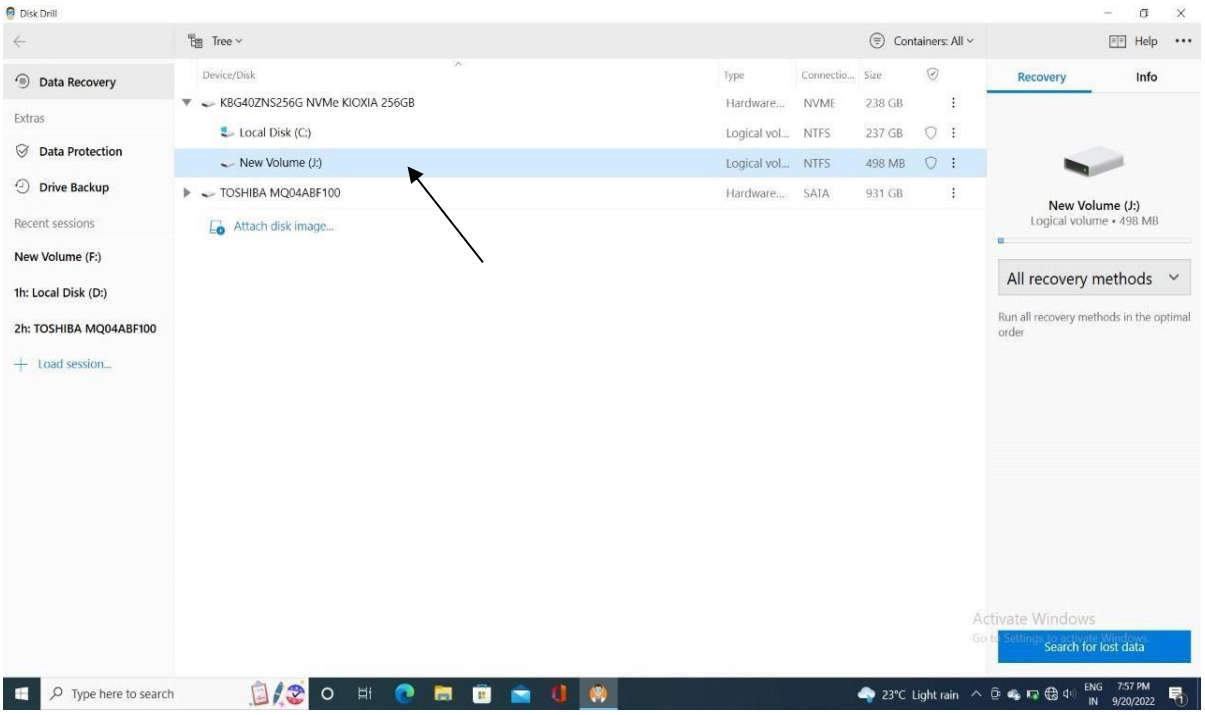
Step 4 –Check whether the file is correct or not.



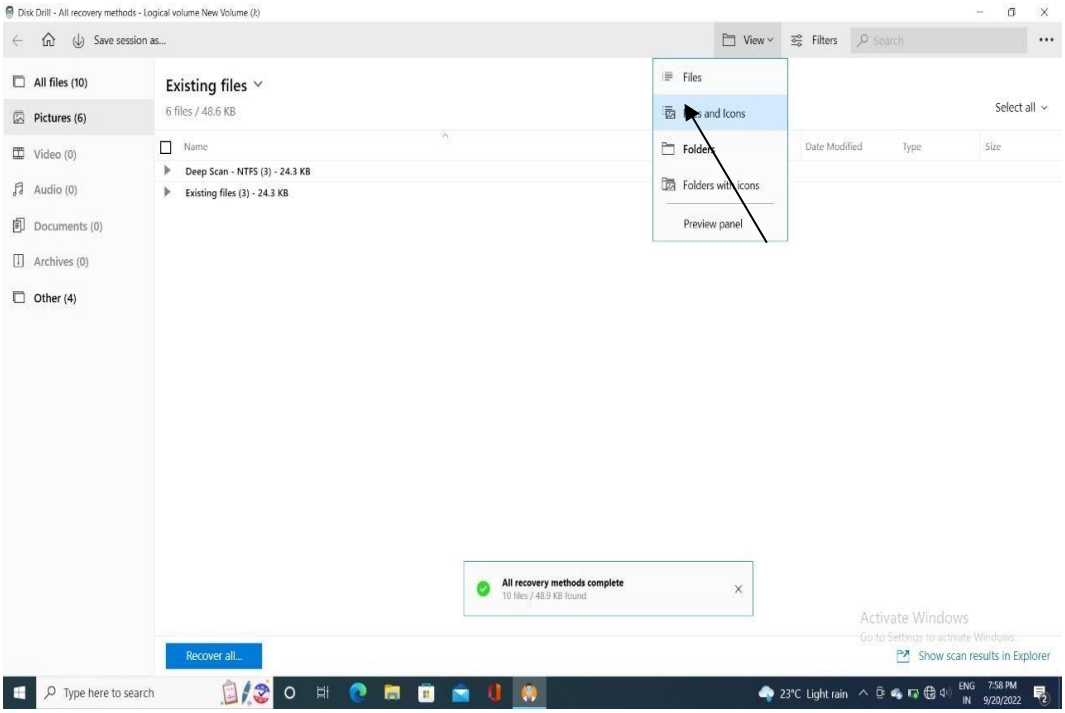
Step 5:- Delete a Data/file from your device



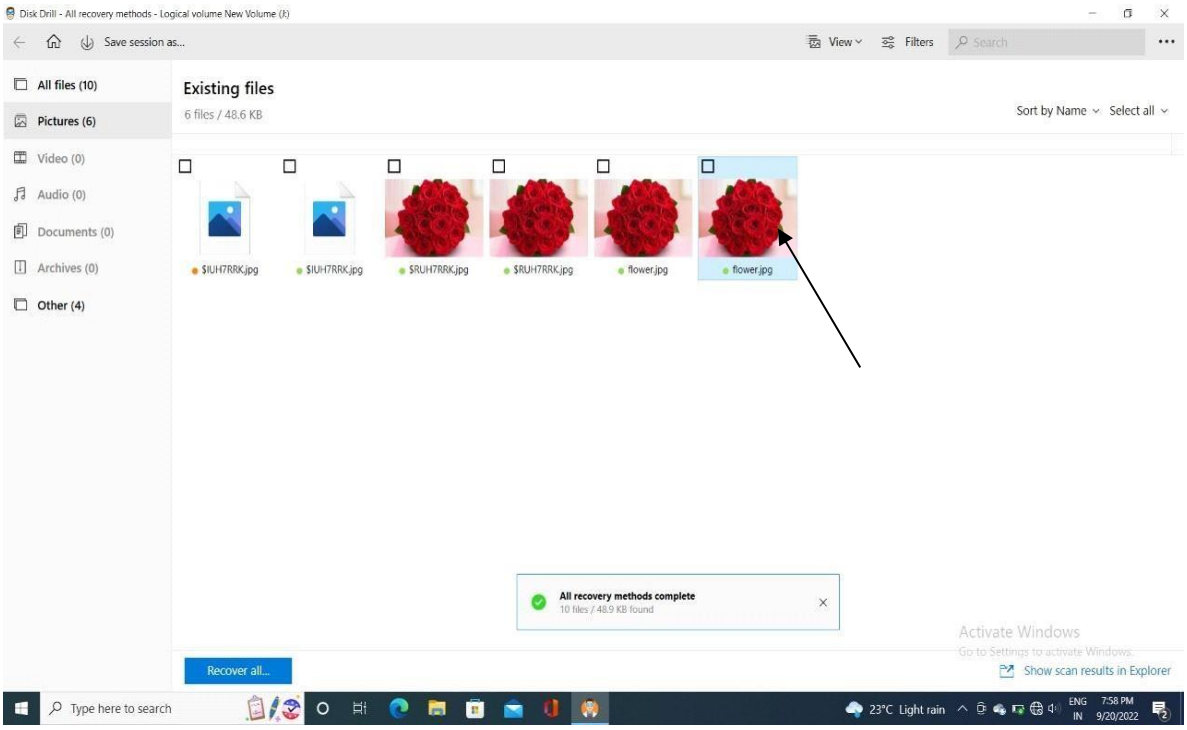
Step 6 - Open the disk drill app and select the drive where the file was saved and click on searchlost data



Step 7:- After Scanning, click on the file and icon option



Step 8 – By following above steps you'll get your all the data/files recovered.



GROUP A: ASSIGNMENT NO 4

Title: - Log Capturing and Event correlation

Step 1:- Run the following python script

EXPLORER

LOG CAPTURING

file.log

log.py

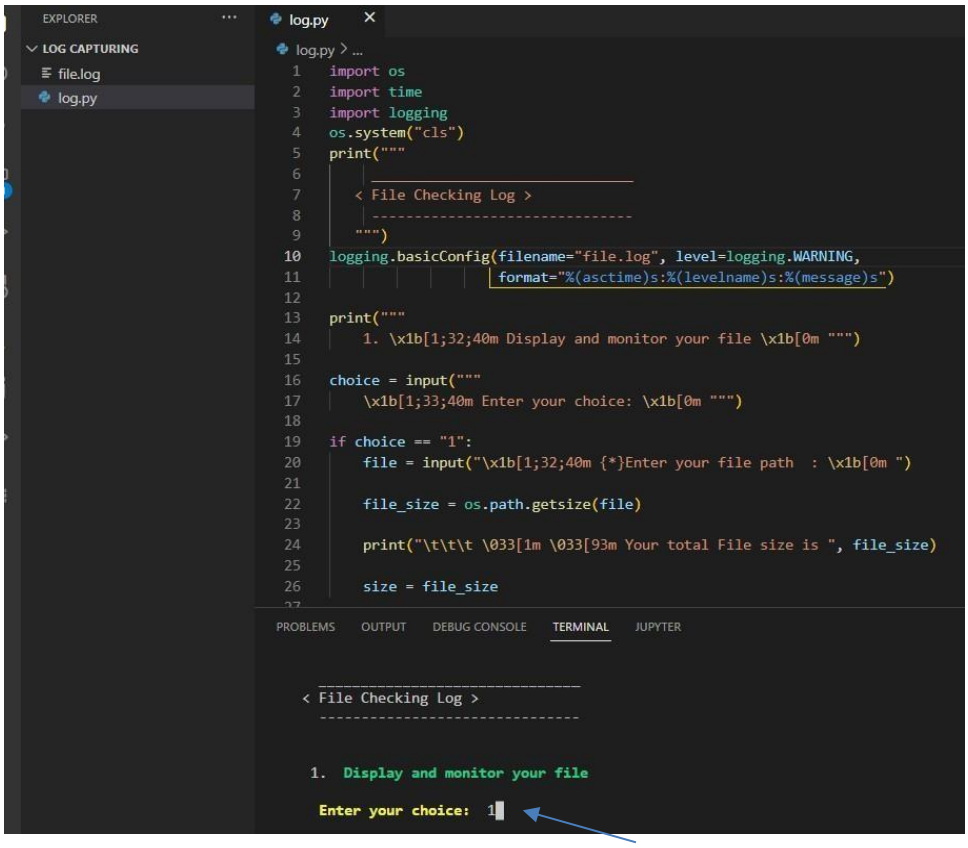
log.py > ...

```python
import os
import time
import logging
os.system("cls")
print("""
    ____________________________
  < File Checking Log >
    ----------------------------
  """)
logging.basicConfig(filename="file.log", level=logging.WARNING,
                    format="%(asctime)s:%(levelname)s:%(message)s")

print("""
    1. \x1b[1;32;40m Display and monitor your file \x1b[0m """)

choice = input("""
    \x1b[1;33;40m Enter your choice: \x1b[0m """)

if choice == "1":
    file = input("\x1b[1;32;40m {*}Enter your file path  : \x1b[0m ")

    file_size = os.path.getsize(file)

    print("\t\t\t \033[1m \033[93m Your total File size is ", file_size)

    size = file_size
```

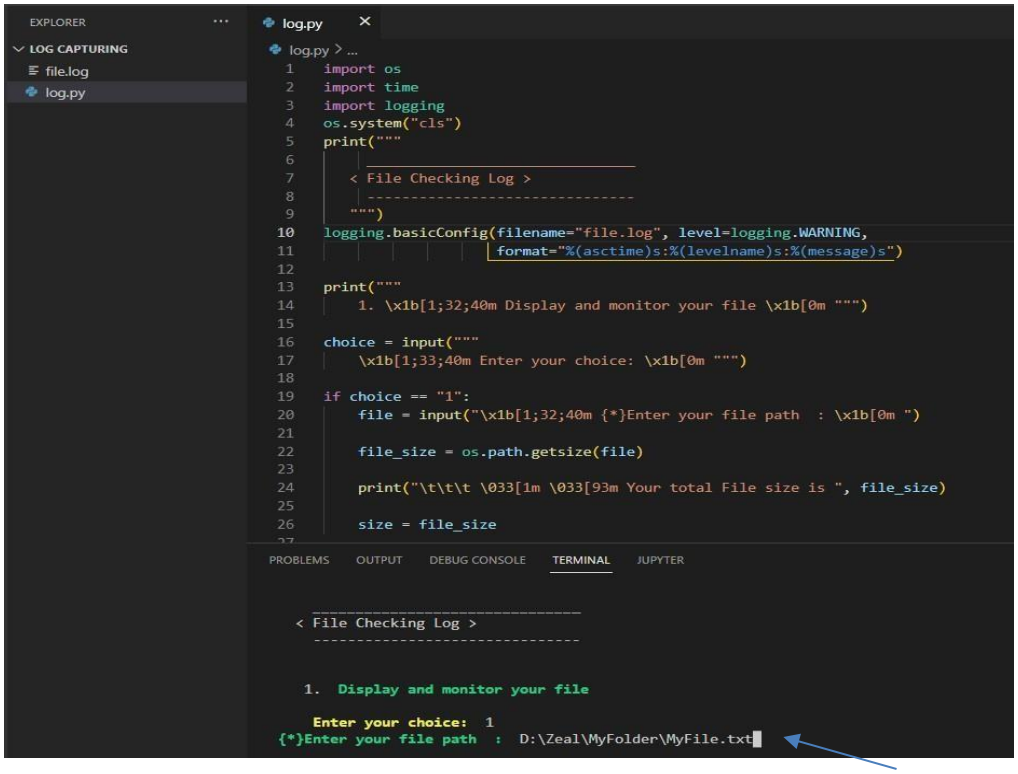
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL JUPYTER

```
  ____________________________
< File Checking Log >
  ----------------------------


  1.  Display and monitor your file

  Enter your choice:
```

Step 2 :- Enter choice as “1” and click enter

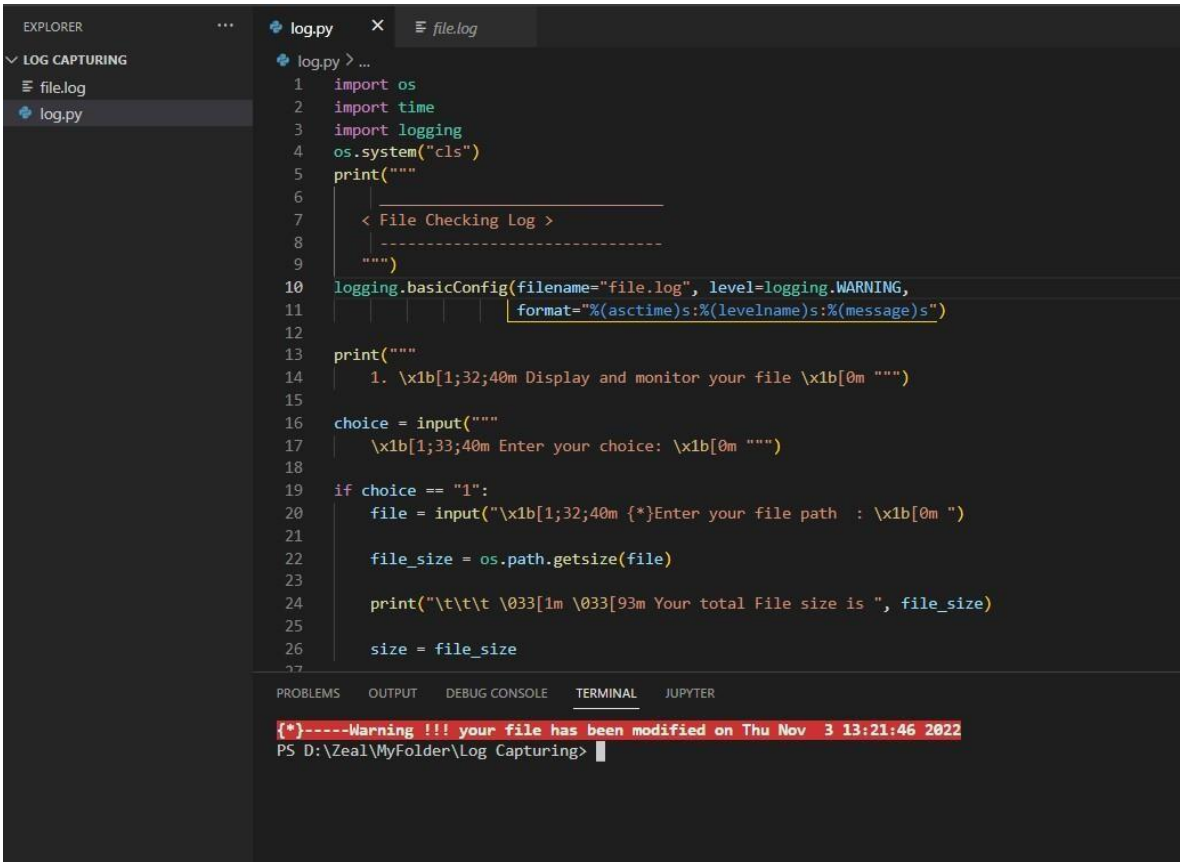


Step 3: Enter File Path for which you want to monitor Here ,e.g. “D:\Zeal\MyFolder\MyFile.txt” and Press Enter



Step 4: As we modified the file , we can the log in “file.log”

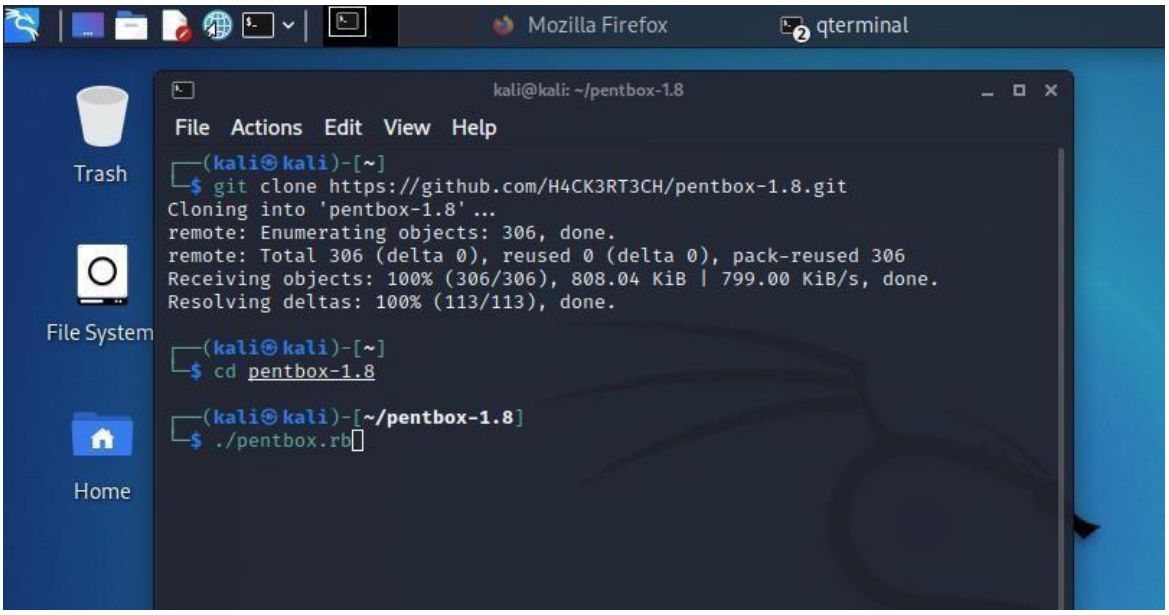
Step 5 : We can also see the file monitoring program being terminated after the file being modifiedand showing Warning Message in the console representing Event Correlation.



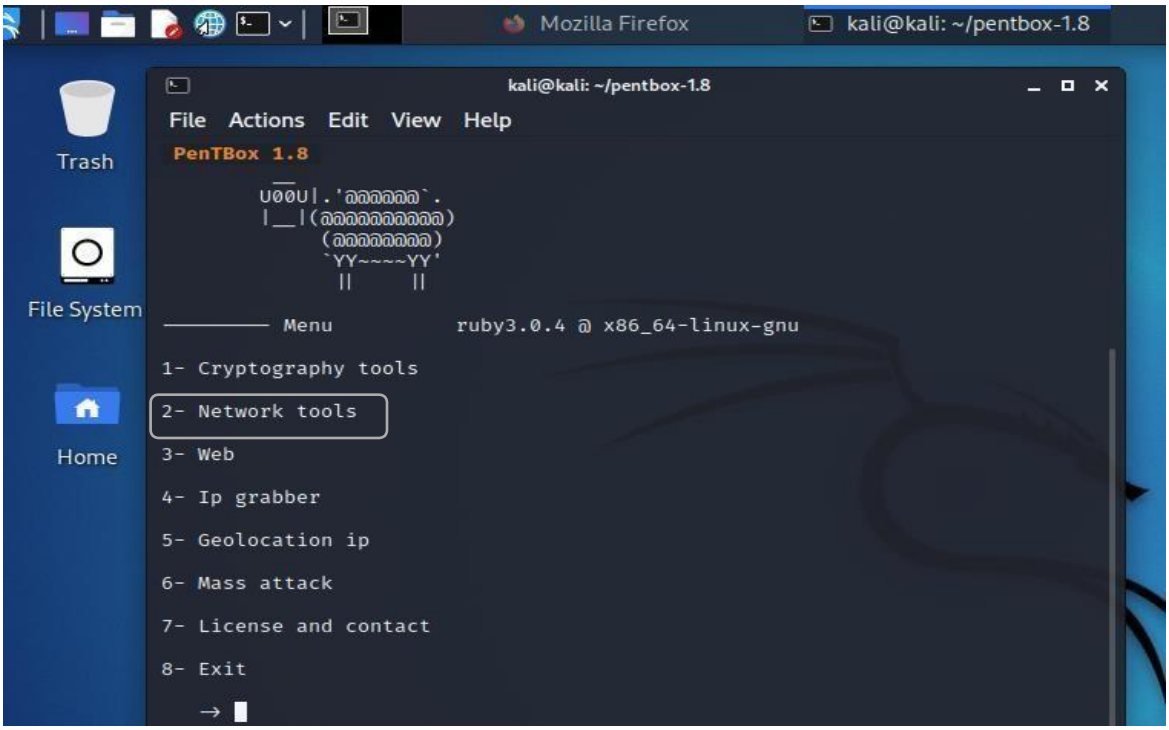
GROUP A: ASSIGNMENT NO 5

Title-: Study of Honeypot

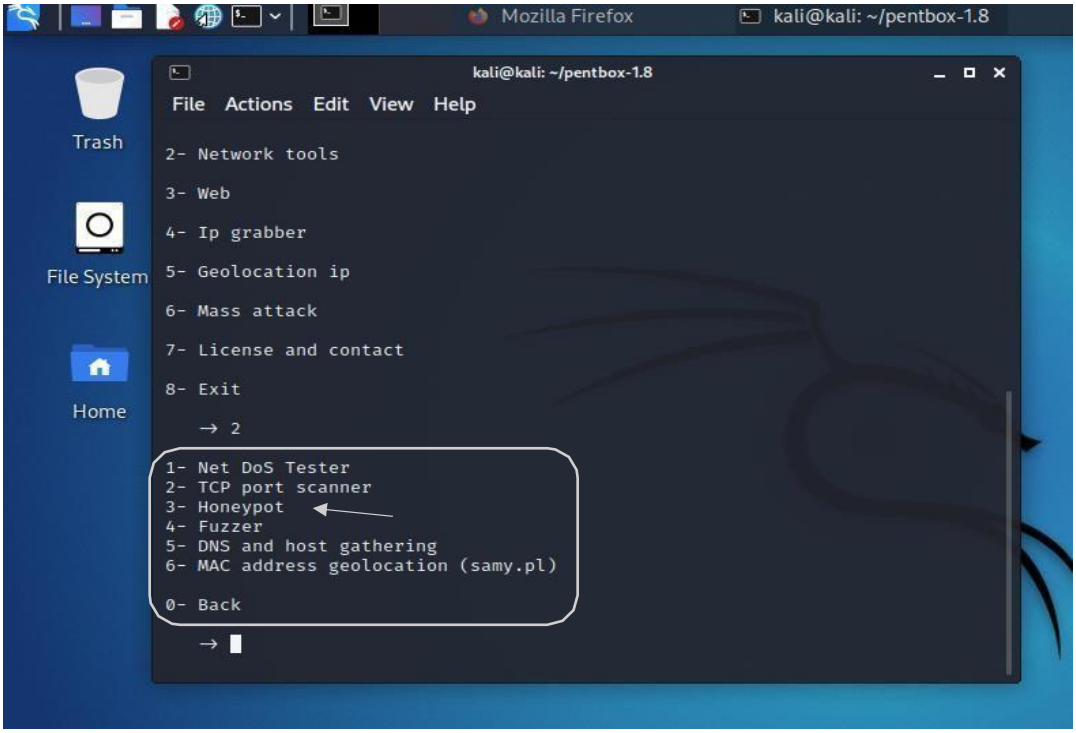
Step 1**:** Run the following command on Linux console git clone https://github.com/H4CK3RT3CH/pentbox-1.8cd pentbox-1.8./pentbox.rb



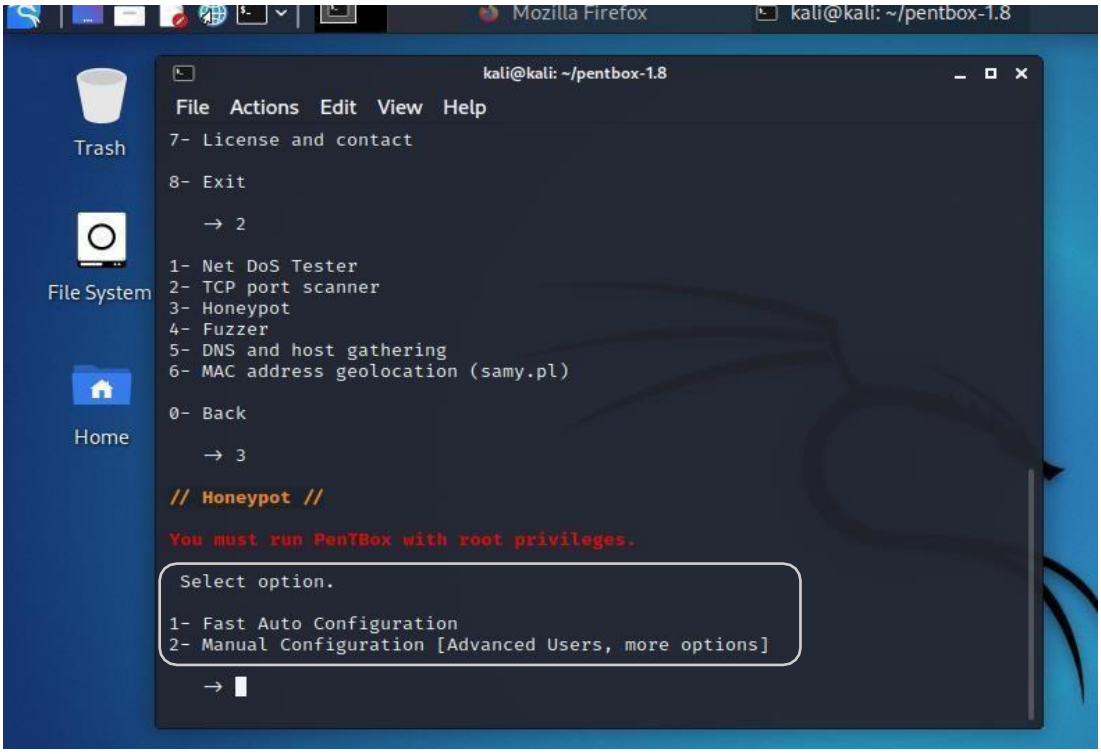
Step 2-: Choose Option 2 i.e. “Network tools”



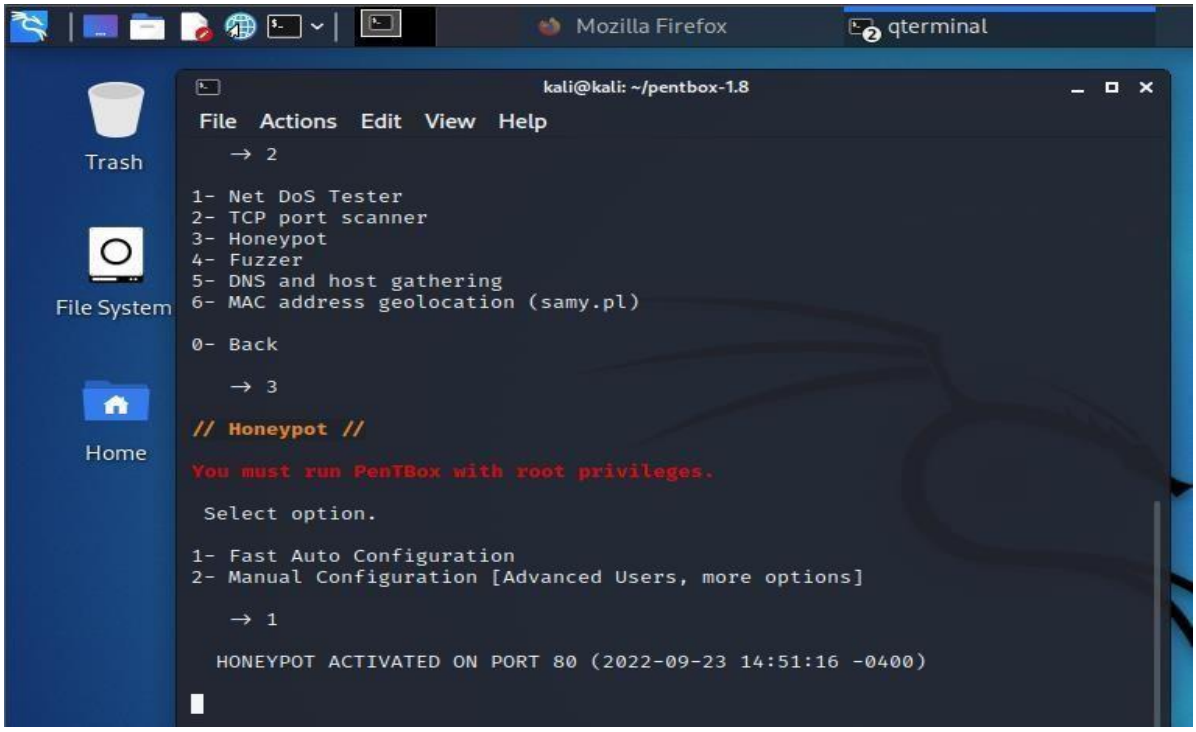
Step 3:- Choose Option 3 “Honeypot”



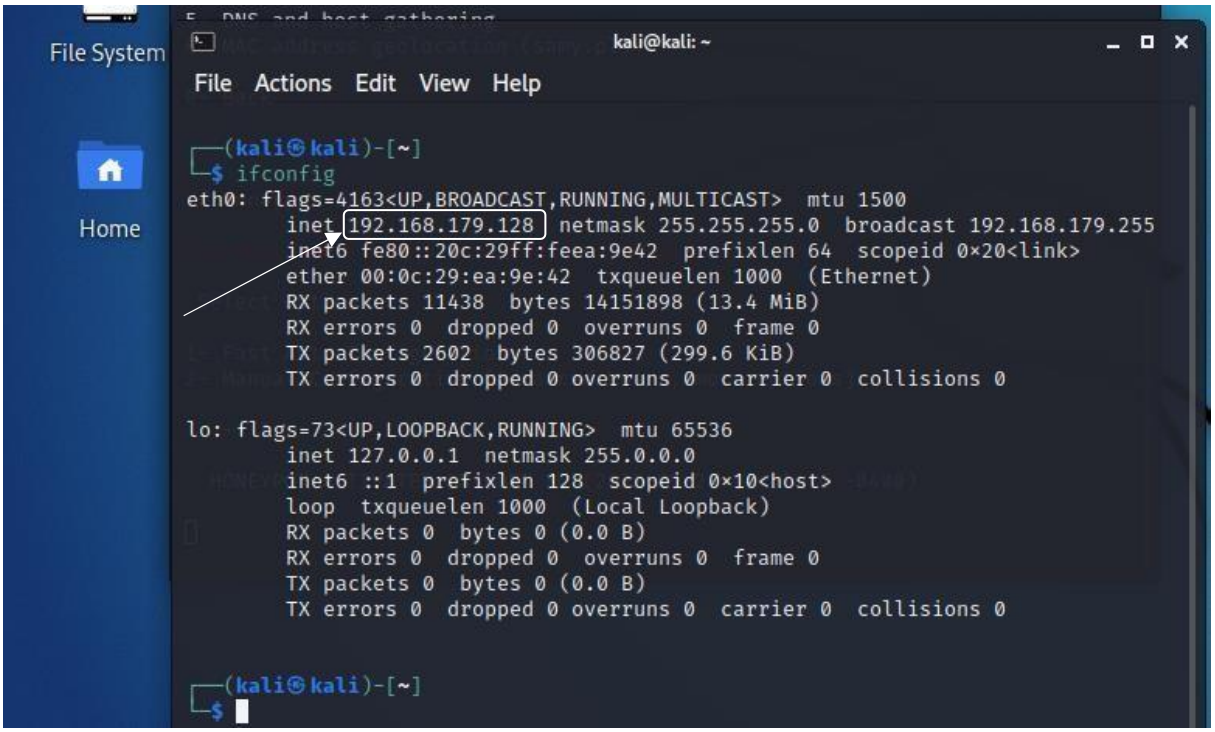
Step 4: Select the configuration i.e. automatic or manual. Here we have chosen “1— Fast AutoConfiguration”



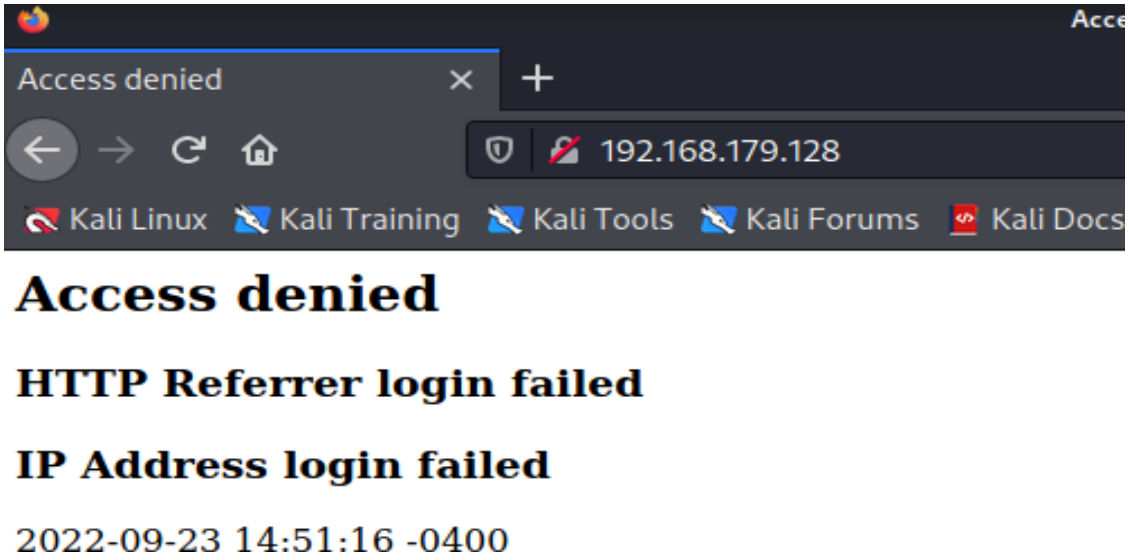
After this Honeypot will be activated on default port no. 80



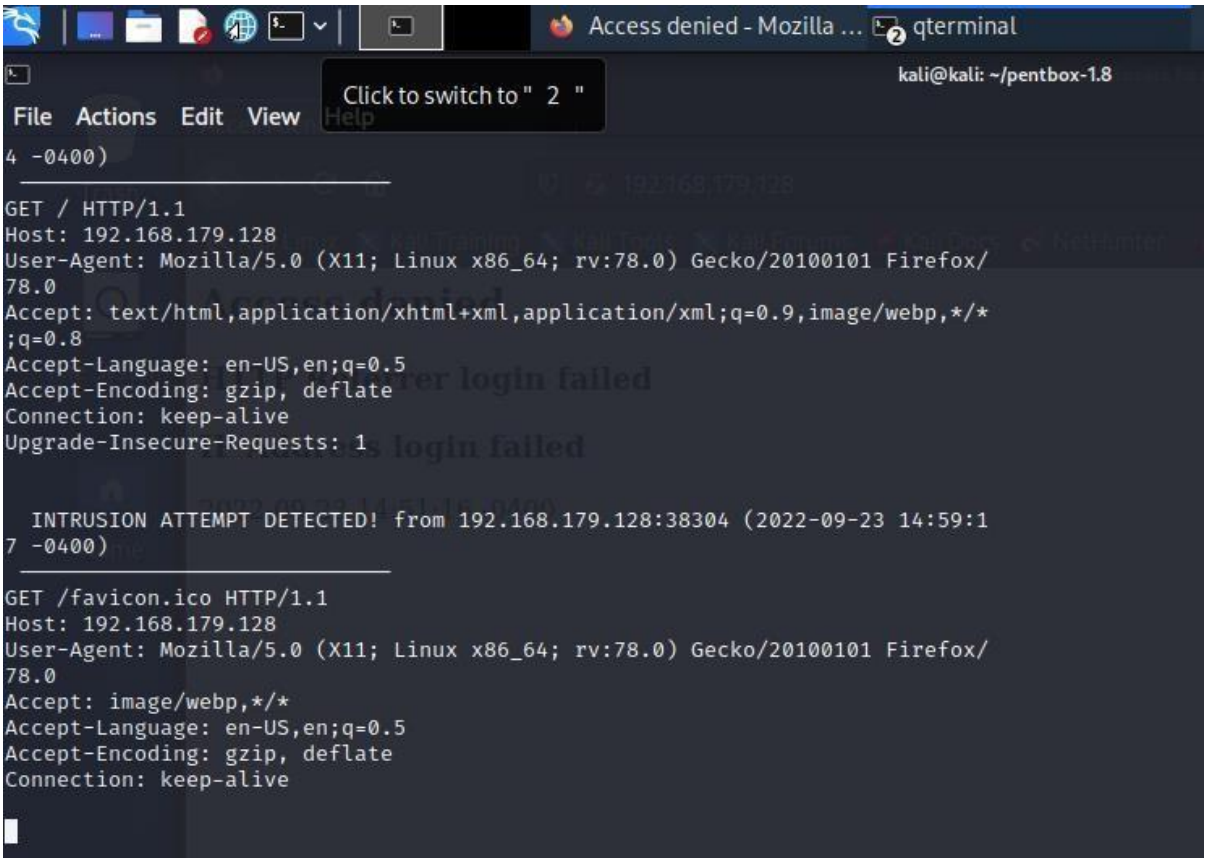
Step 5: Take a new terminal and type the command “ipconfig” to get the local IP address ofthe hostmachine. Here local IP of host machine is “192 .168.179.128”



Step 6: Try attacking this device via localhost or some other locally connected devices. We can see thesome customtext output which honeypot creates.



Output:



Thus, we can see the logs on the console and interpret the result and take precautions accordingly.