FIRST LAYER NETWORK HACK: IMPORTANCE OF STRONG WiFi PASSWORD

Eric Chen, Angelika Kocab, Yaofang Guan, Raysul Rashed, Aparicio Carranza

19th Annual City Tech
Poster Session

ABSTRACT

With the consumer demand, vendor solutions and industry standards, wireless network technology is factual and is here to stay. Wireless Local Area Networks or WiFi networks are a priority nowadays. To fulfill the wireless demands, WiFi product vendors and service contributors are exploding up as quickly as possible. A strong Wi-Fi password can prevent hackers from accessing a wireless network, viewing traffic and even stealing sensitive data. Yet, Wi-Fi is not unbreakable. Hence, we created a simple application for regular users to generate strong Wi-Fi passwords. We verify the effectiveness of our solution by ethically hacking the Wi-Fi password. To improve efficiency, we created a Graphical User Interface (GUI) application by integrating the common password cracking tools. Our GUI penetration testing tool is less labor intensive and resource hungry to find password vulnerabilities and to protect the networks from attackers

INTRODUCTION

- **The goal of this project is to crack Wi-Fi password under WPA2/PSK environment and look for strong Wi-Fi password pattern.**
- **We will explain the methodology of hacking the WPA2 Wi-Fi password and use pre-built tool for implementation.**
- **We will create a GUI application to aggregate all hacking process.**
- **Create a Wi-Fi password generator to help regular user to create strong Wi-Fi password.**

TOOLS

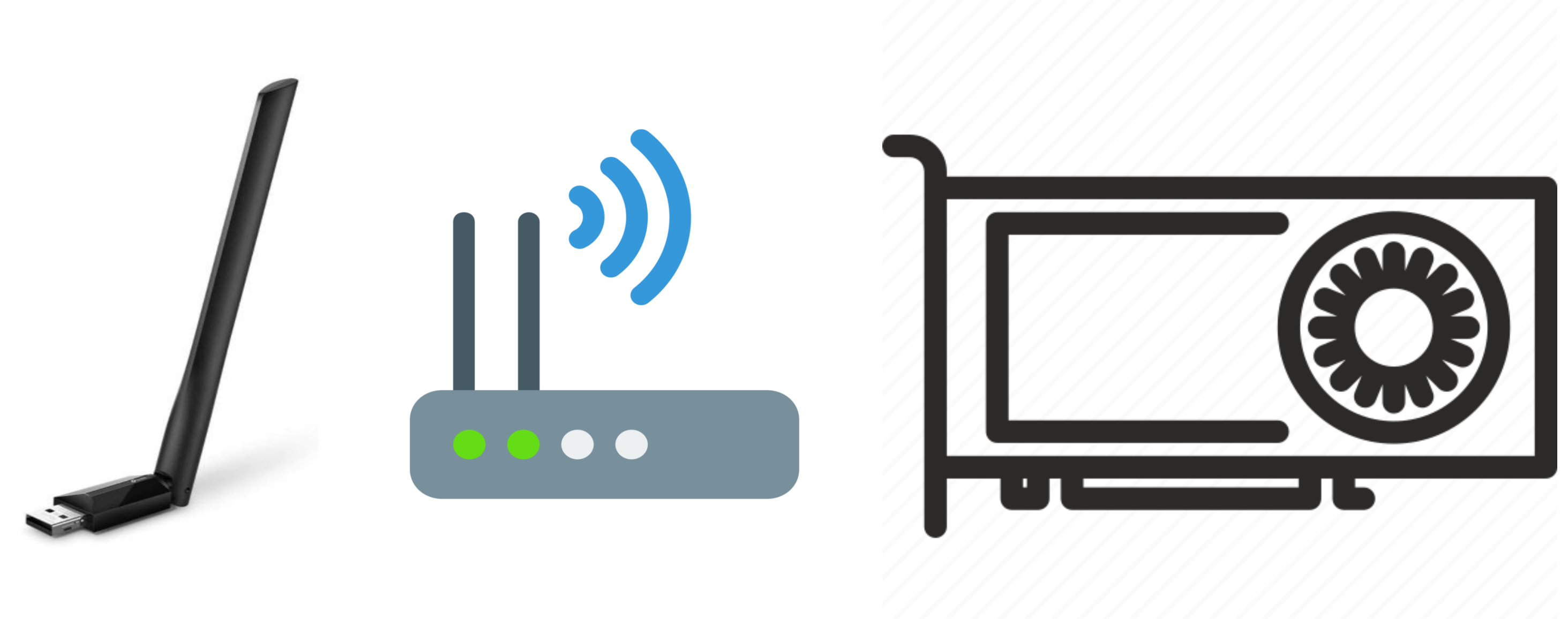
KALI LINUX™
"the quieter you become, the more you are able to hear"

vmware

python™

NVIDIA
CUDA

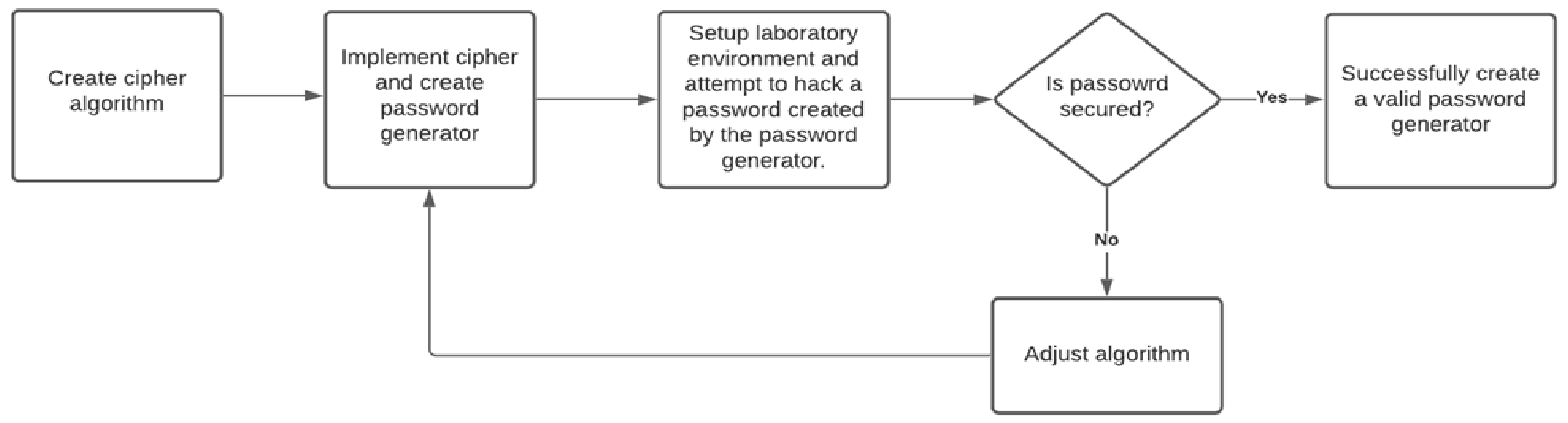
HARDWARE



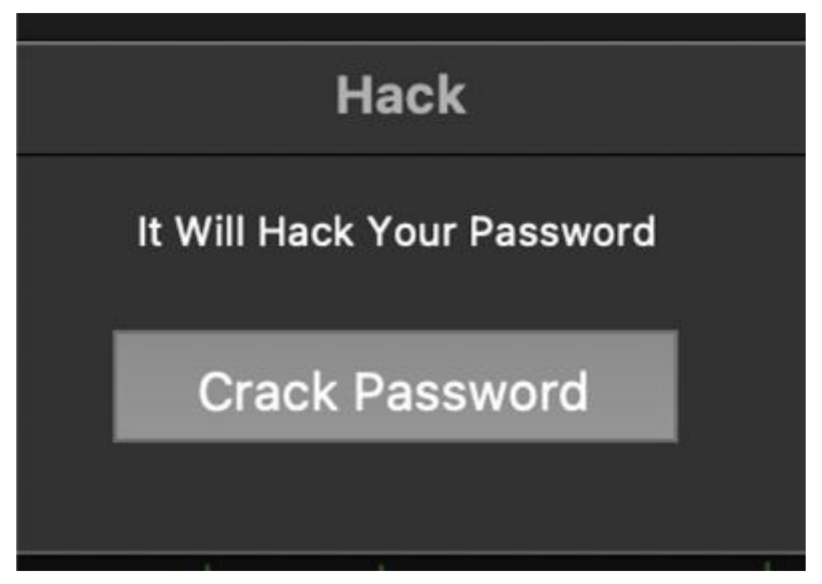
IMPLEMENTATION PROCEDURE

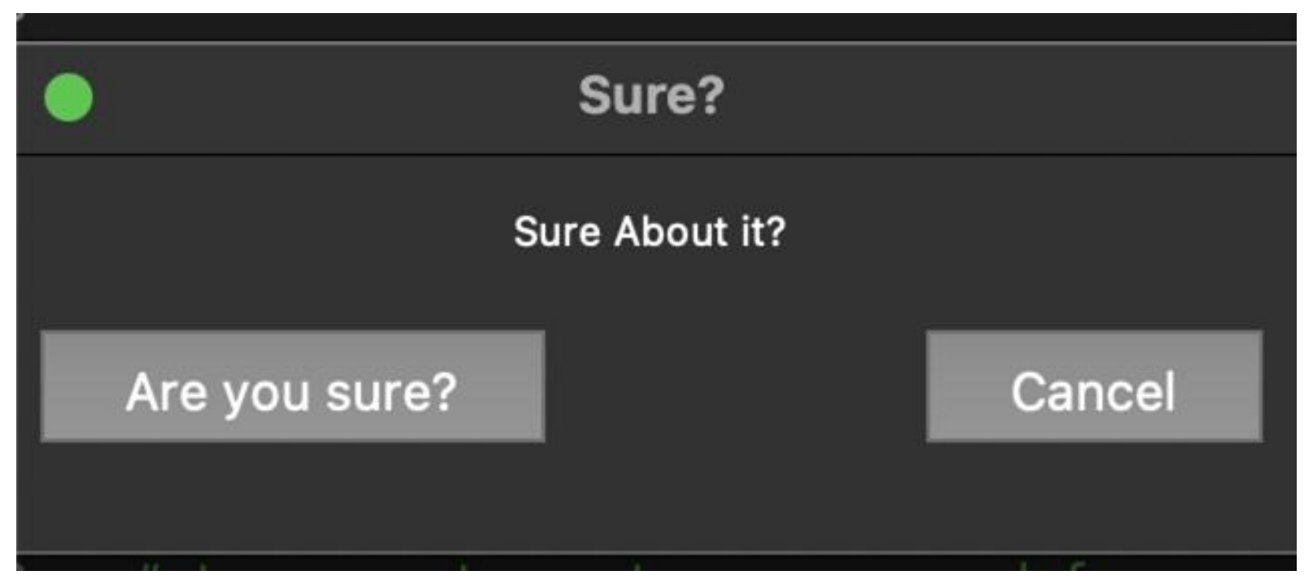
- **Create a Wi-Fi password generator base on the strong pattern found in this project.**
- **Determine a strong password pattern from the result of previous step.**
- **Capture four-way handshake file from target Wi-Fi network.**
- **Brute force cracking Wi-Fi password using the captured handshake file.**
- **Create a GUI to combine the two process above upon successfully hacking a Wi-Fi password manually.**
- **Setup multiple Wi-Fi passwords with different pattern and use the GUI to repeat the hacking process.**

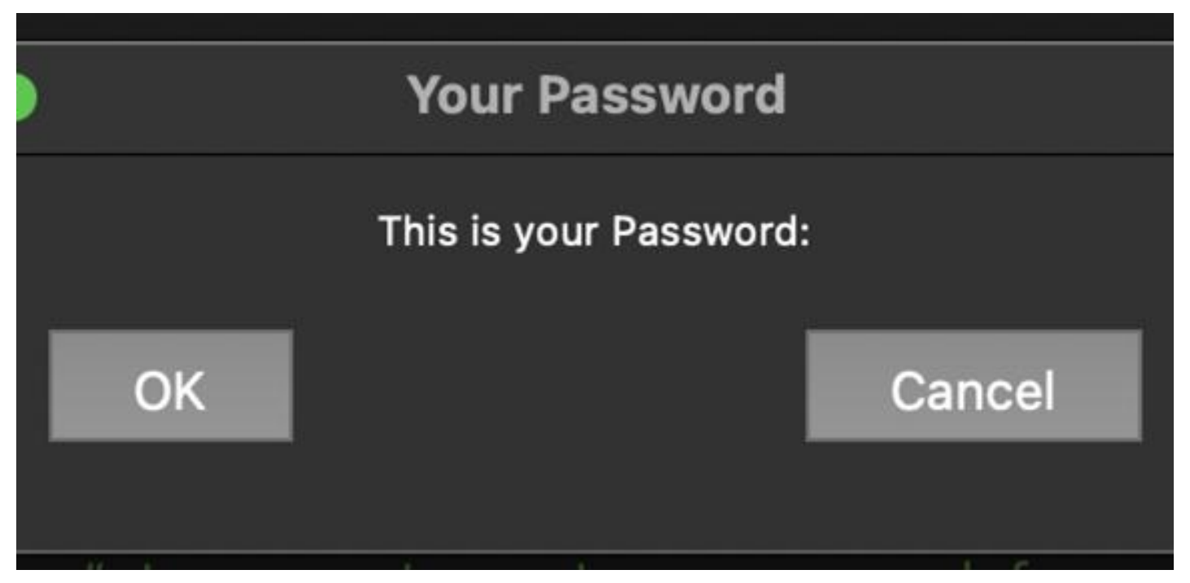
FLOW CHART

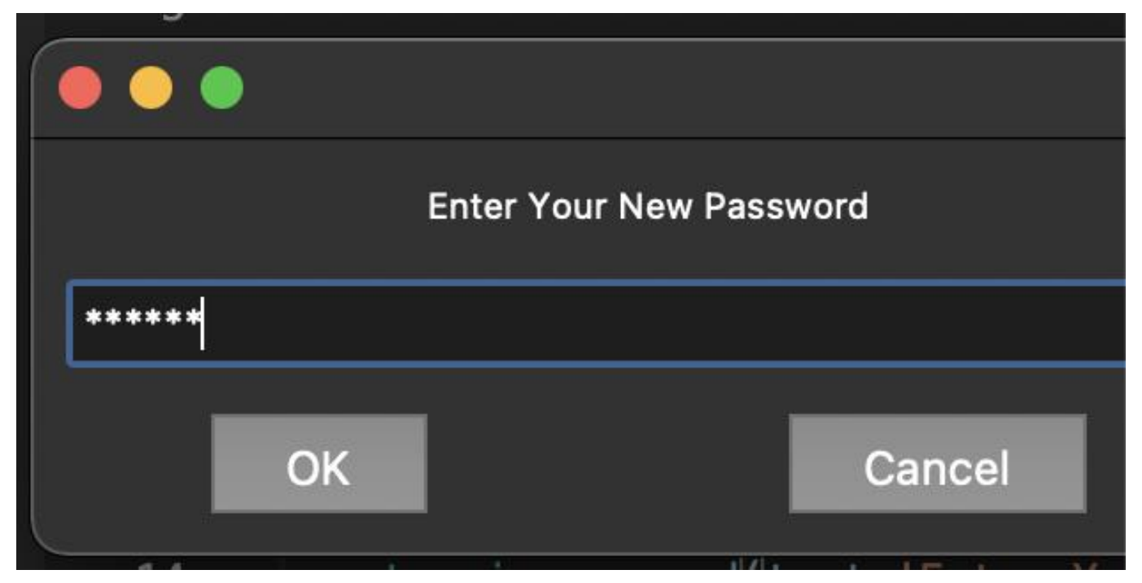

Create cipher algorithm
Implement cipher and create password generator
Setup laboratory environment and attempt to hack a password created by the password generator.
Is passowrd secured?
Yes
Successfully create a valid password generator
No
Adjust algorithm

PRELIMINARY RESULTS

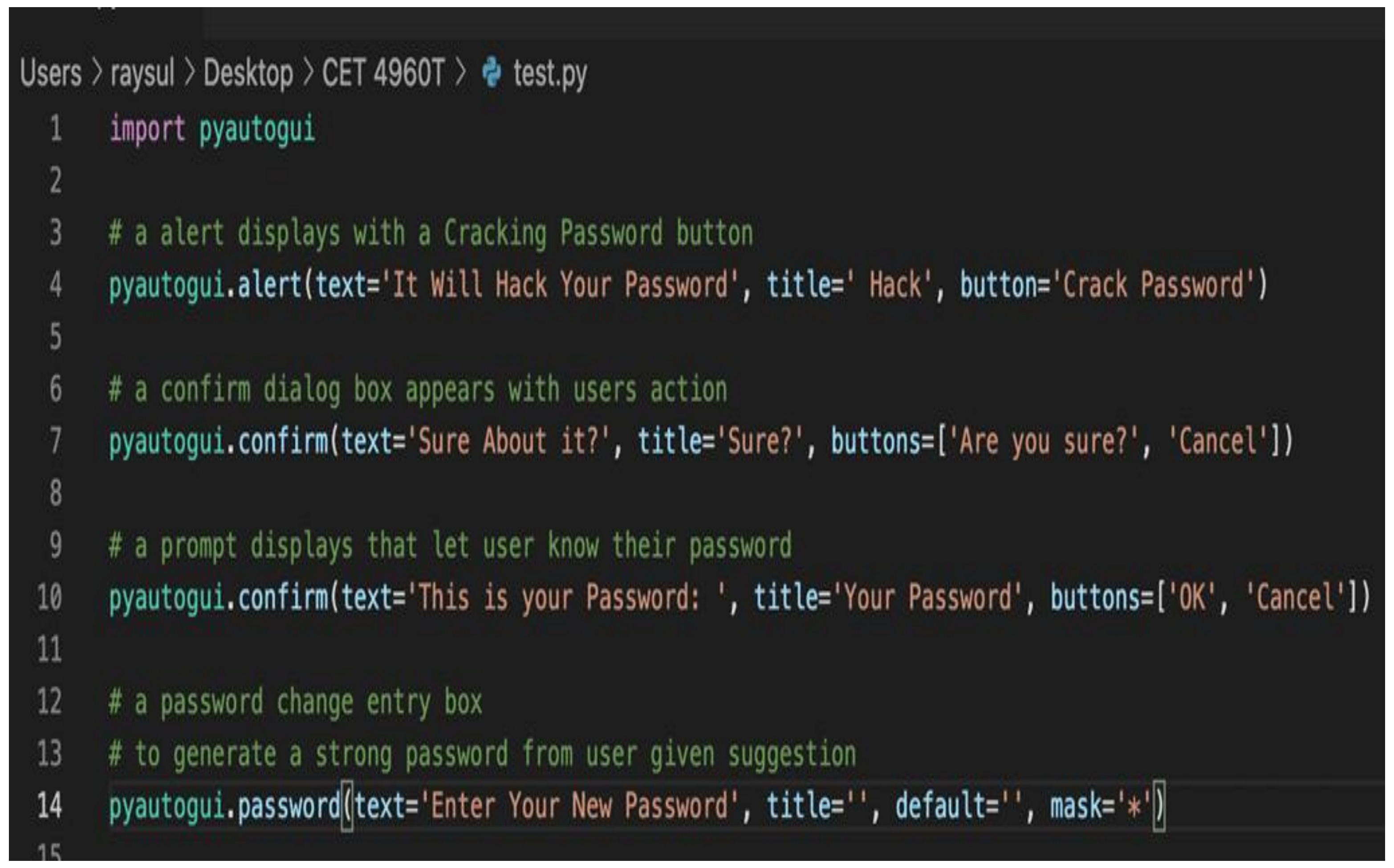








CODE



Users › raysul › Desktop › CET 4960T › test.py

```python
import pyautogui

# a alert displays with a Cracking Password button
pyautogui.alert(text='It Will Hack Your Password', title=' Hack', button='Crack Password')

# a confirm dialog box appears with users action
pyautogui.confirm(text='Sure About it?', title='Sure?', buttons=['Are you sure?', 'Cancel'])

# a prompt displays that let user know their password
pyautogui.confirm(text='This is your Password: ', title='Your Password', buttons=['OK', 'Cancel'])

# a password change entry box
# to generate a strong password from user given suggestion
pyautogui.password(text='Enter Your New Password', title='', default='', mask='*')
```

CONCLUSION

The lack of security on many wifi networks allows hackers to easily get into systems and cause destruction. In our project we created the password generator to mitigate the vulnerability of simple Wi-Fi password against hackers.As a final result we have proven that a strong and secure password becomes much harder for hackers to access users information through a wifi hack, let alone use it to harm you.

REFERENCES

- https://www.cyberpunk.rs/capturing-wpa-wpa2-handshake
- https://cylab.be/blog/32/how-does-wpawpa2-wifi-security-work-and-how-to-crack-it
- https://www.wifi-professionals.com/2019/01/4-way-handshake#:~:text=The%204%2Dway%20handshake%20is,data%20sent%20over%20Wireless%20medium
- https://www.wrc.noaa.gov/wrso/security_guide/password.htm
- https://cybernews.com/best-password-managers/password-cracking-techniques/