Cybersecurity Mini Project Report

Project Title: PasswordCheck – A Password Strength and Breach Detection Tool

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# Project Overview

PasswordCheck is a Python-based desktop application that checks the strength of any password and tells you if it's been exposed in a real-world data breach using the Have I Been Pwned (HIBP) API. It features a modern black-themed UI, live strength checking, and integration with breach detection.

# Objectives

✔️ Check password complexity and strength

✔️ Warn users about weak or common passwords

✔️ Detect exposed passwords using HIBP API

✔️ Convert the Python app into a standalone .exe file

# Technologies Used

|  |  |
| --- | --- |
| Executable Build | Pyinstaller |
| Language | Python 3.x |
| GUI Framework | Tkinter |
| Image Handling | Pillow (PIL) |
| API Integration | requests library |
| API Source | Have I Been Pwned API |

# User Interface Features

- Dark theme GUI with a cyber-themed background

- Resizable app window with dynamic background scaling

- Entry field with Show/Hide toggle

- Instant feedback on password strength

- Display of whether a password has been found in a breach

- .exe version available for easy distribution

# How HIBP API Is Used

The application checks the SHA1 hash prefix of the user’s password against the Have I Been Pwned Pwned Passwords API using a secure method that protects the full password. If the password has been found in past breaches, the user is notified.

# How to Use the App

1. Run the app (passwordcheck.py) or the .exe file

2. Enter a password to test

3. View strength level (Weak, Medium, Strong)

4. See if the password has been found in any data breach

5. Use the show/hide toggle as needed

# Folder Structure

passwordcheckfinal/  
├── passwordcheck.py # Main app script  
├── back.png # Background image  
└── README.2 # Project description

# Conclusion

The PasswordCheck project effectively demonstrates password security awareness by allowing users to analyze password strength and check for data breaches. It highlights the importance of secure password creation and the risk of using common or previously exposed passwords.

# Future Improvements

- Add password generation suggestions

- Add support for saving reports

- Add login form integration demo

- Package as an installer (.msi)

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