

Password Strength Analyzer with Custom Wordlist Generator

Introduction

In the era of growing cybersecurity threats, weak passwords remain a major vulnerability. This project addresses this problem by offering a GUI-based tool that analyzes the strength of user passwords and generates customized wordlists based on personal information - a common method used by ethical hackers during penetration testing. The tool is intended for cybersecurity learners and professionals to understand how weak or guessable passwords can be identified and improved.

Abstract

The project leverages the zxcvbn password strength estimator (developed by Dropbox) to analyze the complexity and predictability of user-input passwords. Alongside, a wordlist generator uses details like name, pet, and birth year to create variations including leetspeak (e.g., replacing 'a' with '@', 's' with '\$'). These lists mimic what attackers may use in dictionary attacks, helping users understand how predictable personal information can be weaponized. The project is implemented using Python and features a user-friendly GUI with tkinter.

Tools Used

- Python
- zxcvbn-python - for password strength analysis
- tkinter - for graphical user interface
- Custom modules - for leetspeak generation and wordlist creation

Steps Involved in Building the Project

1. Password Analyzer Module (`analyzer.py`): Accepts user passwords from CLI, uses zxcvbn to evaluate strength.
2. GUI Module (`gui_app.py`): Provides a user interface using tkinter to analyze and display

password strength.

3. Wordlist Generator (`wordlist_generator.py`): Generates and saves a wordlist based on user info.

4. Helper Functions (`utils.py`): Includes a leetspeak generator to make more complex wordlists.

Conclusion

This project highlights how easy it is to evaluate and crack weak passwords using available tools and predictable information. By creating an interactive and educational platform, the tool helps users understand password vulnerabilities and the importance of strong, unique credentials. The project also provides a hands-on learning experience in Python, GUI development, and basic ethical hacking principles.