

Password Strength Analyzer with Custom Wordlist Generator

Introduction

Weak passwords remain one of the most common security vulnerabilities, leading to account breaches and unauthorized access. This project focuses on analyzing password strength and demonstrating how attackers generate custom wordlists from personal information. The goal is to raise awareness and strengthen authentication practices.

Abstract

This project implements a Python-based tool that evaluates password strength using the zxcvbn algorithm with a safe entropy fallback. In addition, it generates custom wordlists based on user-provided information such as names, dates of birth, and locations. The tool also supports leetspeak transformations, year suffixes, and common separators. Results highlight common weaknesses and show how simple personal data can be weaponized by attackers to guess weak passwords.

Tools Used

- Python
- zxcvbn (password strength estimation library)
- argparse (command-line interface)
- Virtual environment (venv) for isolated setup
- Kali Linux environment for testing

Steps Involved

- 1 Set up the project structure and Python virtual environment.
- 2 Implemented password analysis using zxcvbn with entropy-based fallback.
- 3 Created wordlist generator that expands user context with case variants, leetspeak, and date/year patterns.
- 4 Added support for suffixes, separators, and wordlist size limits (e.g., capped at 5,000).
- 5 Tested tool with different inputs and verified outputs (analyzer results + wordlist samples).
- 6 Documented the tool with README.md and prepared this project report.

Conclusion

The Password Strength Analyzer with Custom Wordlist Generator successfully demonstrates both the weaknesses of predictable passwords and the methods used by attackers to generate targeted guesses. The project reinforces the importance of using long, unique passphrases combined with multi-factor authentication. Future enhancements could include a graphical interface, integration with cracking tools in a controlled lab environment, and policy compliance benchmarking.