

Password Strength & Hygiene Toolkit - Setup Guide

Password Tool Setup & Implementation Guide

This guide summarizes environment setup, key modules, how analysis works, and how to generate the accompanying PDF.

1. Environment Setup

```
python -m venv .venv
```

source .venv/bin/activate

2. Commands Cheatsheet

Action	Command	Notes
Run analysis	analyze.py	Path to input file
Generate PDF	generate_pdf.py	Path to output file
Test module	test.py	Module name
Help	help	

3. Module Responsibilities

Module	Purpose	Notes
password_analyzer	Analyze password strength	Entropy, complexity, patterns
personal_context	Detect personal context leakage	Common words, date/times, email
hygiene_checker	Check for hygiene issues	Weak salts, missing keys
pdf_generator	Generate PDF reports	HTML output, styling

4. Entropy & Strength

Entropy ~ `length * log2(charset_size)` . Charset size increments for lowercase, uppercase, digits, specials ('!@#\$%^&*')

. Strength

5. Pattern Detection

- Regex for repeated character runs `(.)\1{2,}`

- 4-ch

6. Personal Context Leakage

User input (e.g. `alice 1999 alice@example.com`) tokenized; tokens length 3 matched in password. Year-like patterns flag

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7. File Scan Flow

1. Read lines.

2. SH

8. Generator Policy

min_length: 14

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Guarantees one from each required class; fills remainder from combined pool. Shuffled using `secrets` for unpredictabi

ty.

9. Crack Time Estimate

Educational formula: `(2 ** entropy_bits) / 1e10` guesses/sec baseline. Not a guarantee real attackers prune guesses.

10. Extending

- Add breach check API.

- Mor

11. Testing

Run all tests:

```
pytest -q
```

Focus on deterministic modules; randomness tested by required class presence.

12. Generating PDF

After installing docs extras:

```
python scripts/build_pdf.py
```

Produces `docs/password_tool_guide.pdf`.

13. Resume Bullet Example

"Developed a Python CLI for password analysis combining entropy scoring, pattern & personal data detection, secure gener

ation,
reliab

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14. Interview Sound Bite

"I went beyond simple length rules by modeling entropy, human pattern biases, and personal info leakage.
The tool audits

pass

15. Philosophy

Readable > Clever. Explainable > Flashy. Real attacker heuristics > superficial rules.

16. License

Currently UNLICENSED placeholder. Choose MIT/Apache 2.0 before publishing.

End of setup guide.