Test Report

for

Password & Encryption Detector

Version 2.0

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1. Introduction

1.1 Purpose

This Test Report documents the verification and validation results for the "Password & Encryption Detector" software. It ensures that the system meets the functional, performance, and quality requirements defined in the Software Requirements Specification (SRS).

1.2 Scope

This document covers the results of testing the following functionalities:

- File processing in both single and batch modes
- File type identification via Magika
- Format-specific password and encryption analysis
- Entropy-based fallback analysis
- Result reporting including status, encryption, confidence score, and execution time
- Performance in both asynchronous and synchronous modes

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2. Test Environment

2.1 Hardware and Software Configuration

- **Operating System:** Windows 11 Pro 64 bit
- **Python Version:** 3.8+
- **Libraries Used:** msoffcrypto, PyPDF2, pikepdf, rarfile, py7zr, pypff, and olefile (These libraries are used as-is and not modified)
- **System Specs:**
    - CPU: AMD Ryzen 7 7840HS w/ Radeon 780M Graphics (16 CPUs), ~3.8GHz
    - RAM: 32768 MB
    - Free Storage: 411 GB on 1 TB Kingston SNV2S1000G SSD

2.2 Test Tools

- Built-in Python time library
- Custom CLI test scripts
- Performance monitoring on Windows Task Manager

3. Test Strategy

3.1 Test Types

- **Functional Testing**: Testing individual handlers and modules (file_handlers.py, entropy.py, etc.)
- **Interface Testing**: Testing command line interactions
- **Performance Testing**: Timed analysis for large datasets in both sync and async modes
- **Robustness Testing**: Testing behaviour of the program with results on edge cases

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4. Test Results

4.1 Functional Test

- **File Type Detection:** All supported formats (pdf, csv, xlsx, pptx, docx, ods, tsv, rar, zip, odm, odp, odt) are correctly identified.
- **Success Rates:**
    - **First test files (**Total 225 Test files: **"pdf, xlsx, pptx, docx,rar, zip"** 30 per file formats 15 password protected and 15 not protected, 15 per file formats **"ods, csv, tsv"** 15 not password protected**):**
        - **Password-protected files:** 100% detection (all 15 files correctly identified)
        - **Not password-protected files:** 100% correct identification (all 15 files)
    - **Second test files (**1 by each: ODM, ODP, ODS, ODT**):** 100% detection
- **Exceptions:**
    - 3 PPTX files incorrectly reported as "NOT PASSWORD PROTECTED" with confidence=0.30
    - 1 XLSX file incorrectly reported as "NOT PASSWORD PROTECTED" with confidence=0.30

4.2 Interface Test

- **CLI Behaviour:**
    - Single file mode: Success (logasync4.txt, logsync4.txt)
    - Batch mode: Success (all directory scans completed)
    - Sync/Async modes: Both operational with expected performance differences

4.3 Performance Test

Test Case	Total File Size	Total File Amount	Mode	File Types	Average Time	Total Time	Accuracy Rate
#1	2,13 GB	225	Async	pdf, xlsx, pptx, docx, rar, zip, ods, csv, tsv	3.215 ms	0.7234 s	97%
#1	2,13 GB	225	Sync	pdf, xlsx, pptx, docx, rar, zip, ods, csv, tsv	7.241 ms	1.6293 s	97%
#2	1,33 MB	7	Async	odm, docx, odp, ods, odt, rar	23.257 ms	0.1628 s	100%
#2	1,33 MB	7	Sync	odm, docx, odp, ods, odt, rar	14.557 ms	0.1019 s	100%
#3	168 GB	1650	Async	pdf, xlsx, pptx, docx, rar, zip, ods, csv, tsv, py, exe, c, cpp, txt, class, java, md, html, css, mp3, mp4, gif, jpg, mp4, vdi, vbox, log, 7z, pfx, vmdk, vmxf, nvram, odp, odm, odt	2.528 ms	4.1721 s	98%
#3	168 GB	1650	Sync	pdf, xlsx, pptx, docx, rar, zip, ods, csv, tsv, py, exe, c, cpp, txt, class, java, md, html, css, mp3, mp4, gif, jpg, mp4, vdi, vbox, log, 7z, pfx, vmdk, vmxf, nvram, odp, odm, odt	8.432 ms	13.9133 s	98%
#4	1,03 GB	1	Async	zip	83 ms	0.0837s	100%
#4	1,03 GB	1	Sync	zip	80 ms	0.0800s	100%

4.4 Robustness Test

- **Special Cases:**
  - LibreOffice formats (ODM, ODP, ODS, ODT): All correctly handled
  - Mixed archive types (ZIP, RAR): 100% accuracy
  - Very small files (<1KB): No failures observed
  - Very big files (>1GB): No failures observed

4.5 Summary Table

Test Area	Total Cases	Passed	Failed	Comments
Functional Testing	8	6	2	4 False Negatives (3 pptx 1 xlsx), otherwise all test cases are clear
Interface Testing	8	8	0	All CLI modes functional
Performance Testing	8	8	0	Async is faster when file size/number increases, buy Sync is faster with small size/number files
Robustness Testing	8	8	0	Edge cases handled properly

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5. Defect Log

- PPT/XLSX False Negatives:
    - Severity: Medium
    - Files: sifreli (12/13/15).pptx, sifreli (15).xlsx
    - Status: Unresolved
    - To-Do’s: OfficeOpenXMLHandler's PPT/XLSX detection logic can be modified

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6. Conclusion

The detector shows higher than 95% accuracy for most file types (PDF, DOCX, XLSX, archives).

Async mode is much more faster when big amount of files (>10) are processed.
Sync mode is significantly faster when small amount of files (<10) are processed.