

AIFORT: AI-Enhanced Intelligence Forensic Tool

AIFORT is a Python-based digital forensic tool that provides 12 analysis options, including file hashing, metadata extraction, keyword search, timeline analysis, hidden file detection, log parsing, network traffic analysis, PDF report generation, and simulated AI chat assistance (DeepSeek and Open AI). This README explains how to download Visual Studio Code (VS Code) and run the aifort.py script on Windows, Linux, or macOS.

Prerequisites

Before running the code, ensure you have the following:

- Visual Studio Code (VS Code):** A free code editor.
- Python 3.8+:** Required to run the script.
- Python Libraries:** scapy and Pillow for network and image analysis.
- LaTeX Distribution:** TeX Live (Linux/macOS) or MiKTeX (Windows) for PDF report generation.
- Test Files:** Sample files to test the tool’s functionality.

Step-by-Step Instructions

1. Download and Install VS Code

Download VS Code:

Visit code.visualstudio.com.

Click Download for your operating system (Windows, Linux, or macOS).

For Linux, choose the appropriate package (e.g., .deb for Ubuntu, .rpm for Fedora).

Install VS Code:

Windows: Run the downloaded .exe file and follow the setup wizard.

Linux:

Ubuntu: `sudo dpkg -i code_*.deb`

Fedora: `sudo rpm -i code_*.rpm`

macOS: Drag the .dmg file to the Applications folder.

Verify Installation:

Open VS Code by searching for “Visual Studio Code” in your applications menu or running code in a terminal.

Ensure the welcome screen appears.

2. Set Up Your Project Directory

Create a Project Folder:

Create a folder named aifort_project (e.g., C:\Users\YourName\aifort_project on Windows or ~/aifort_project on Linux/macOS).

Add the Code:

Download or copy the aifort.py script (provided separately).

In VS Code, go to File > New File, paste the code, and save as aifort.py in aifort_project.

Prepare Test Files:

Create the following files in aifort_project for testing:

test.txt: Content: Hello, World!

photo.jpg: A JPEG image with EXIF data (e.g., from a camera or Unsplash).

.hidden.txt: Content: Hidden file content (starts with a dot).

log.txt: Content: 2025-05-06 10:00:00 Access from 192.168.1.1

traffic.pcap: A sample PCAP file (download from Wireshark SampleCaptures).

Create a subdirectory test_dir and copy test.txt and .hidden.txt:mkdir test_dir
cp test.txt .hidden.txt test_dir/

Terminal commands to create files:echo "Hello, World!" > test.txt
echo "Hidden file content" > .hidden.txt
echo "2025-05-06 10:00:00 Access from 192.168.1.1" > log.txt

3. Install Dependencies

Install Python 3.8+:

Download from python.org.

Install, ensuring “Add Python to PATH” is checked (Windows).

Verify:python --version

Output should show Python 3.8 or higher.

Install Python Extension in VS Code:

In VS Code, go to the Extensions view (Ctrl+Shift+X or Cmd+Shift+X on macOS).

Search for “Python” (by Microsoft) and click Install.

Install Python Libraries:

Open the VS Code terminal (Terminal > New Terminal or `Ctrl+```).

Update pip:python -m pip install --upgrade pip

Install scapy and Pillow: pip install scapy Pillow

Verify: pip show scapy
pip show Pillow

Install LaTeX for PDF Reports:

Windows:

Download MiKTeX from miktex.org.

Install, selecting "Install missing packages on-the-fly".

Linux:

Install TeX Live: sudo apt-get update

sudo apt-get install texlive-full latexmk

macOS:

Install MacTeX: brew install mactex

Install latexmk: sudo tlmgr install latexmk

Verify latexmk: latexmk --version

4. Configure VS Code

Set Python Interpreter:

Open VS Code and load aifort_project (File > Open Folder).

Press Ctrl+Shift+P, type Python: Select Interpreter, and choose your Python 3.8+ installation (e.g., Python 3.10.12).

Verify in terminal: python --version

Check Terminal Shell:

Windows: Use Command Prompt or PowerShell (default).

Linux/macOS: Use Bash or Zsh.

Adjust: Terminal > Configure Terminal Settings.

5. Run the Code

Open aifort.py:

In VS Code, open aifort.py from aifort_project.

Run the Script:

Option 1: Click the "Run" button (triangle, top-right) or press F5.

Option 2: In the terminal, navigate to aifort_project: cd /path/to/aifort_project

Run: python aifort.py

Interact with the Menu:

The tool displays a menu: === AIFORT: AI-Enhanced Intelligence Forensic Tool ===

1. File Hashing
2. File Metadata Extraction (Advanced)
3. File Signature Analysis
4. Keyword Search
5. Timeline Analysis
6. Hidden File Detection
7. Log File Parser
8. Generate PDF Report
9. Analyze Network Traffic (PCAP)
10. DeepSeek Chat Assistance
11. Open AI Chat Assistance
12. Exit

Enter a number (1-12) to select an option.

6. Test the Tool

Use absolute paths for inputs (e.g., C:\Users\YourName\aiFORT_project\test.txt on Windows or /home/user/aiFORT_project/test.txt on Linux /macOS). Example tests:

File Hashing (Option 1):

Input: /path/to/aiFORT_project/test.txt

Expected: Hashes (MD5, SHA1, SHA256) displayed.

Metadata Extraction (Option 2):

Input: /path/to/aiFORT_project/photo.jpg

Expected: File metadata and EXIF data (if available).

Keyword Search (Option 4):

Input: Directory: /path/to/aiFORT_project/test_dir, Keyword: hello

Expected: Match found in /path/to/aiFORT_project/test_dir/test.txt.

Generate PDF Report (Option 8):

Run other options first, then input: report.pdf

Expected: PDF report generated at report.pdf

Check report.pdf in aiFORT_project.

Exit (Option 12):

Input: 12

Expected: Exiting AIFORT. Goodbye!

7. Troubleshooting

Python Not Found:

Verify Python is in PATH: python --version.

Re-select interpreter: Ctrl+Shift+P, Python: Select Interpreter.

Module Not Found:

Reinstall: pip install scapy Pillow.

Check Python environment matches VS Code interpreter.

LaTeX Errors (Option 8):

Verify latexmk: latexmk --version.

Ensure MiKTeX/TeX Live is installed and has all packages.

Check folder write permissions.

File Not Found:

Use absolute paths.

Verify test files exist: ls (Linux/macOS) or dir (Windows).

PCAP Issues (Option 9):

Ensure traffic.pcap is valid (download from Wireshark).

Reinstall scapy: pip install scapy.

Permissions:

Run VS Code as administrator (Windows) or use sudo (Linux/macOS).

Set folder permissions:chmod -R u+rwx aiFORT_project

8. Debugging

Set Breakpoints: Click beside line numbers in aiFORT.py.

Debug Mode: Press F5 or Run > Start Debugging (select Python File).

Inspect: Use Debug pane to check variables like self.results.

Errors: View stack traces in Debug Console or terminal.

Additional Notes

Dependencies: Requires scapy, Pillow, and a LaTeX distribution (TeX Live/MiKTeX).

Cross-Platform: Works on Windows, Linux, macOS. Use correct path separators (\ for Windows, / for Linux/macOS).

Performance: Large directories or PCAP files may be slow. Test with small datasets first.

Support: For errors, note the message, OS, and steps completed, and seek help.

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