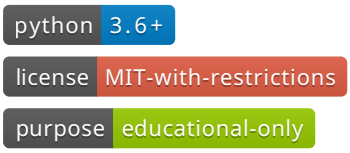
Educational Keylogger Project



⚠ EDUCATIONAL PURPOSE ONLY DISCLAIMER ⚠

This keylogger is developed **SOLELY FOR EDUCATIONAL AND RESEARCH PURPOSES** to demonstrate potential security vulnerabilities and to understand monitoring techniques.

Using this software to monitor someone without their knowledge and consent may be illegal in your jurisdiction and is explicitly discouraged. The author accepts no liability for misuse of this software.

USE RESTRICTIONS:
1. Only use on systems you own or have explicit permission to test
2. Only use for learning about cybersecurity concepts
3. Do not use for monitoring others without informed consent
4. Comply with all applicable laws in your jurisdiction

By using this software, you agree to these terms and conditions.

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Introduction

This project demonstrates a basic keylogger implementation for educational purposes. It showcases how keyboard monitoring can be performed and helps security professionals understand the mechanics behind such tools to better defend against them.

Keyloggers are programs that record keystrokes on a computer system. While they have legitimate uses (parental controls, employee monitoring with consent, self-analysis of typing patterns), they are also used maliciously by attackers to steal sensitive information like passwords and personal data.

Understanding how keyloggers work is essential for:
- Security professionals developing defensive measures
- System administrators implementing endpoint protection
- Developers creating secure input methods
- Security researchers studying user monitoring techniques

Features

- Cross-platform support (Windows, macOS, Linux)
- Keystroke logging with timestamps
- Optional log encryption/decryption
- Configurable log file location
- Ethical safeguards and reminders
- Clean exit mechanism (Ctrl+Alt+Esc)
- Detailed documentation and code comments

Technical Implementation

This keylogger is implemented in Python using the following key components:

1. **Keyboard Monitoring**: Uses the `pynput` library to capture keyboard events
2. **Logging System**: Records keystrokes with timestamps
3. **Encryption**: Optional encryption of log files using Fernet symmetric encryption
4. **Platform Detection**: Adapts to different operating systems
5. **Ethical Safeguards**: Multiple reminders and confirmations

The implementation deliberately avoids:
- Remote data exfiltration capabilities
- Stealth techniques or system hiding

- Persistence mechanisms
- Anti-detection methods
- Automatic startup features

Installation

Prerequisites

- Python 3.6 or higher
- pip (Python package installer)

Dependencies

Install the required dependencies:

```
pip install pynput cryptography
```

For Windows systems, you'll also need:

```
pip install pywin32
```

Setup

1. Clone or download this repository:

```
git clone https://github.com/yourusername/Educational_Keylogger.git
cd Educational_Keylogger
```

1. Ensure the script has execution permissions (Linux/macOS):

```
chmod +x keylogger.py
```

Usage

Basic Usage

Run the keylogger with default settings:

```
python keylogger.py
```

This will:
- Start logging keystrokes
- Save the log to `keylog.txt` in the current directory
- Display an ethical reminder
- Require confirmation before starting

Command Line Options

```
usage: keylogger.py [-h] [--log LOG] [--encrypt] [--decrypt] [--output OUTPUT]

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optional arguments:
  -h, --help       show this help message and exit
  --log LOG        Path to the log file (default: keylog.txt)
  --encrypt        Encrypt the log file
  --decrypt        Decrypt the log file (requires --output)
  --output OUTPUT  Output file for decrypted logs

This tool is for educational purposes only. Unauthorized use is prohibited.
```

Examples

1. **Specify a custom log file location**:

```
python keylogger.py --log /path/to/custom_log.txt
```

1. **Enable log encryption**:

```
python keylogger.py --encrypt
```

1. **Decrypt an encrypted log file**:

```
python keylogger.py --encrypt --decrypt --output decrypted_log.txt
```

Stopping the Keylogger

Press `Ctrl+Alt+Esc` to stop the keylogger, or use `Ctrl+C` in the terminal window.

Defensive Countermeasures

Understanding how keyloggers work allows for better defense. Here are some countermeasures against keyloggers:

Detection Methods

1. **Process Monitoring**:
2. Look for unusual processes in Task Manager/Activity Monitor
3. Monitor for high CPU usage during typing
4. Check for unfamiliar Python or background processes
5. **File System Checks**:
6. Look for unexpected log files
7. Check for recently modified files in system directories
8. Monitor for changes to startup items
9. **Network Monitoring**:
10. Watch for unexpected outbound connections
11. Monitor data transfers when typing occurs
12. Look for unusual DNS requests

Prevention Techniques

1. **Technical Measures**:
2. Use up-to-date antivirus/anti-malware software
3. Implement application whitelisting
4. Use virtual keyboards for sensitive information
5. Apply the principle of least privilege for applications
6. Consider endpoint detection and response (EDR) solutions
7. **Behavioral Practices**:
8. Be cautious about software from untrusted sources
9. Regularly scan your system for malware
10. Use multi-factor authentication
11. Consider password managers with auto-fill (bypasses keyboard)
12. Regularly review running processes and startup items

Legal and Ethical Considerations

Legal Framework

Keyloggers exist in a complex legal landscape that varies by jurisdiction. In general:

- **Consent**: Monitoring without consent is typically illegal
- **Ownership**: Even on systems you own, monitoring others may require notice
- **Workplace Monitoring**: Employers generally must inform employees of monitoring
- **Parental Monitoring**: Parents typically have broader rights to monitor minor children
- **Academic Research**: May require IRB approval and informed consent

Ethical Use Cases

Legitimate uses of keylogging technology include:

1. **Security Research**: Understanding threats to build better defenses
2. **Education**: Teaching cybersecurity concepts in controlled environments
3. **Parental Controls**: Monitoring children's online activities with their knowledge
4. **Self-Monitoring**: Analyzing your own typing patterns or productivity
5. **Authorized Security Testing**: Penetration testing with explicit permission

Contributing

Contributions that improve the educational value of this project are welcome. Please ensure all contributions:

1. Maintain the educational focus
2. Do not add malicious capabilities
3. Include proper documentation and comments
4. Follow the ethical guidelines established in this project

License

2. Removing or modifying the educational disclaimers
3. Redistributing the code without the original disclaimers and restrictions

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Remember: This project exists to educate about security vulnerabilities, not to exploit them. Always prioritize ethical considerations and legal compliance in your security research and practice.