Secure File Sharing Application

Project Overview

Purpose

The Secure File Sharing Application is a Djangobased web application designed to provide a secure and userfriendly platform for file management and sharing. The primary goal is to ensure file confidentiality, integrity, and controlled access through robust encryption and authentication mechanisms.

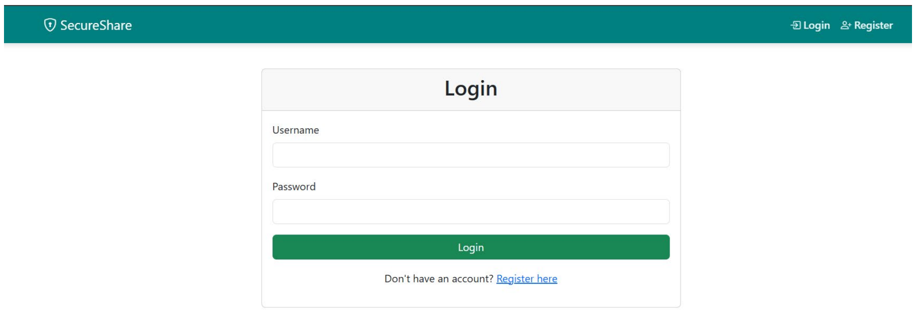
Key Objectives

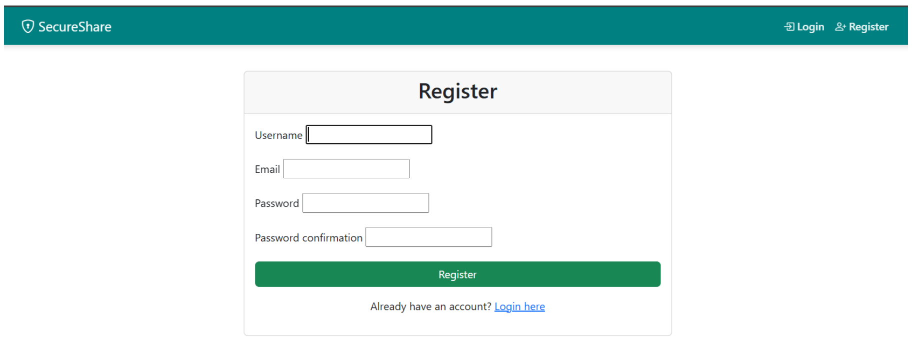
Provide secure user registration and authentication
Enable encrypted file uploads and downloads
Implement secure file sharing between users
Ensure file integrity through cryptographic hashing
Protect against common web vulnerabilities

Features

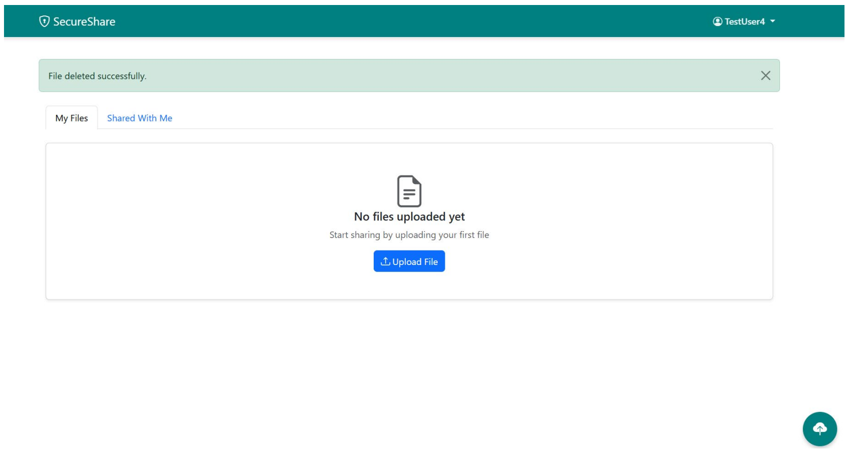
User Authentication

- Secure user registration
- Login/logout functionality
- Password protection





File Upload

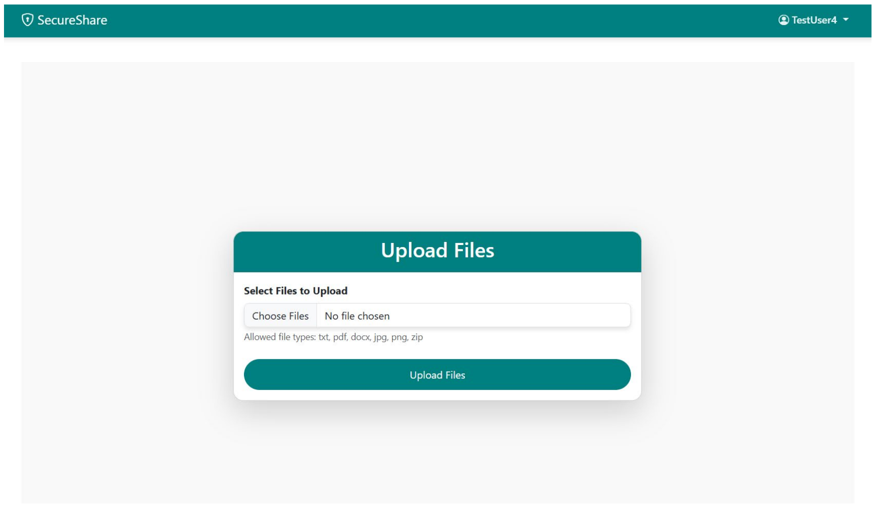


File deleted successfully.

No files uploaded yet

Start sharing by uploading your first file

- Support for multiple file types (txt, pdf, docx, jpg, png, zip)

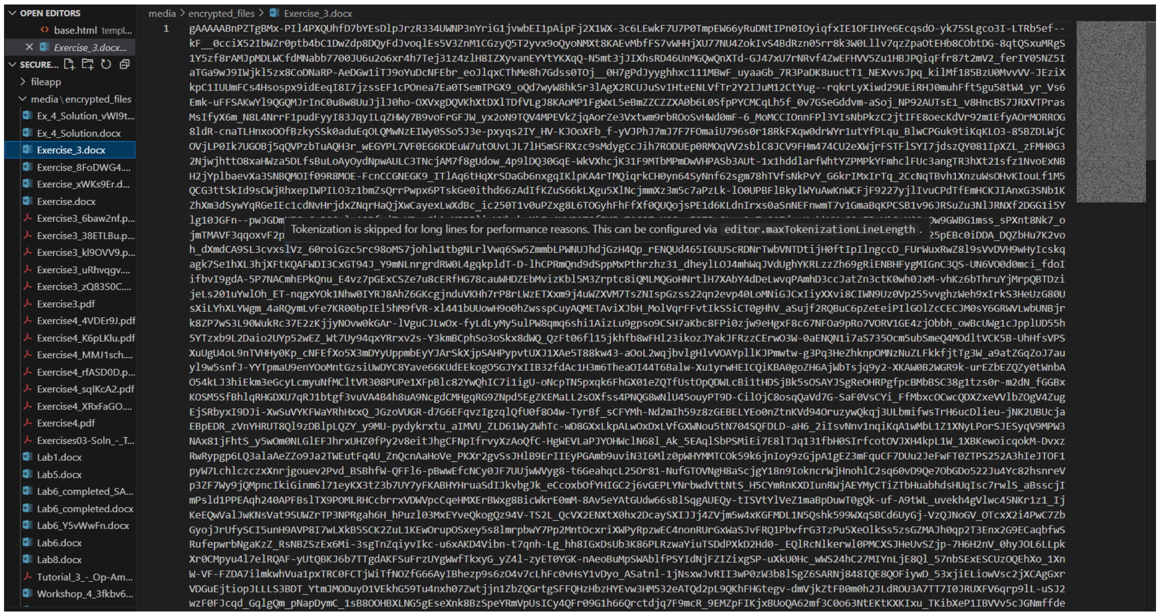


Select Files to Upload

No file chosen

Allowed file types: txt, pdf, docx, jpg, png, zip

- Automatic file encryption before storage



```
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```
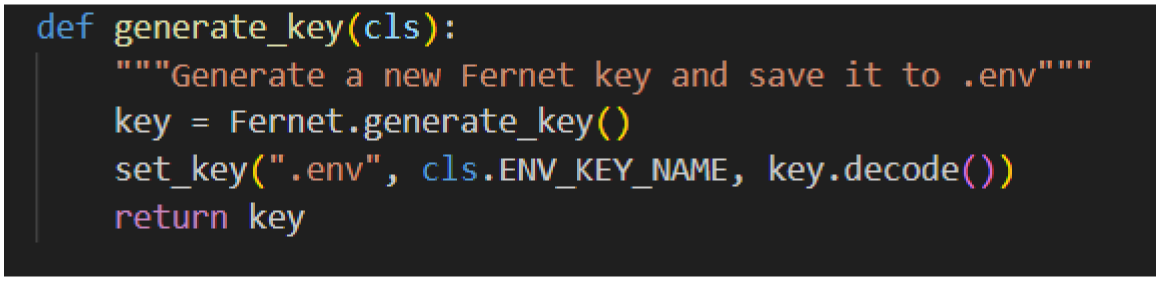

Tokenization is skipped for long lines for performance reasons. This can be configured via `editor.maxTokenizationLineLength`.

- File type validation

File Encryption

- Uses Fernet symmetric encryption

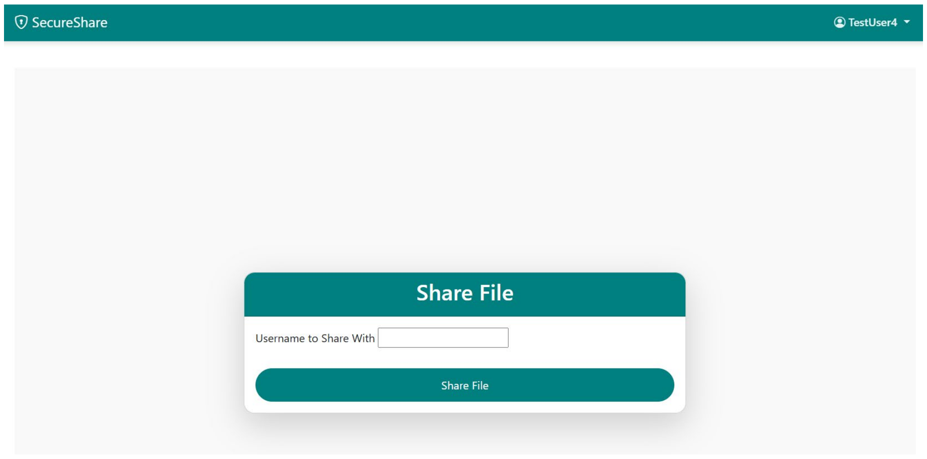


```python
def generate_key(cls):
    """Generate a new Fernet key and save it to .env"""
    key = Fernet.generate_key()
    set_key(".env", cls.ENV_KEY_NAME, key.decode())
    return key
```

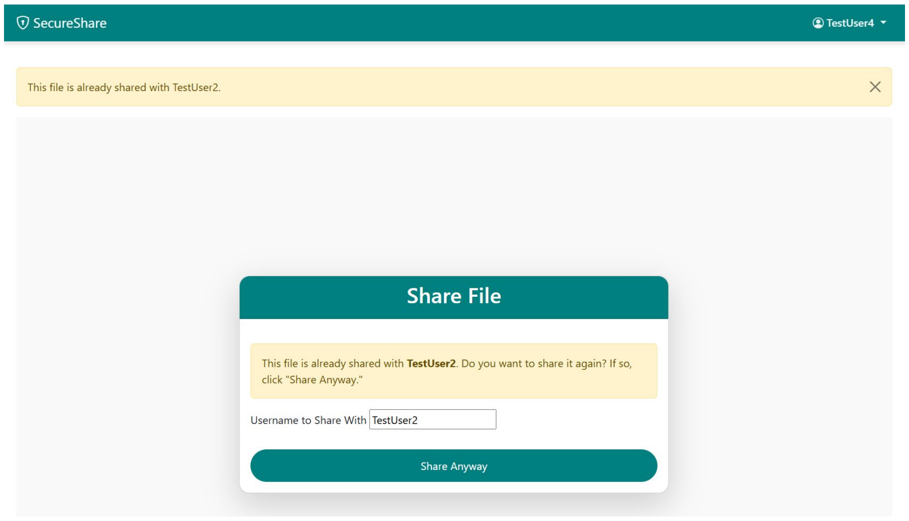
- Generates and manages encryption keys
- Encrypts files before storage
- Decrypts files only during download

File Sharing

- Share files with specific users



- Track file sharing history


SecureShare

TestUser4

This file is already shared with TestUser2.

Share File

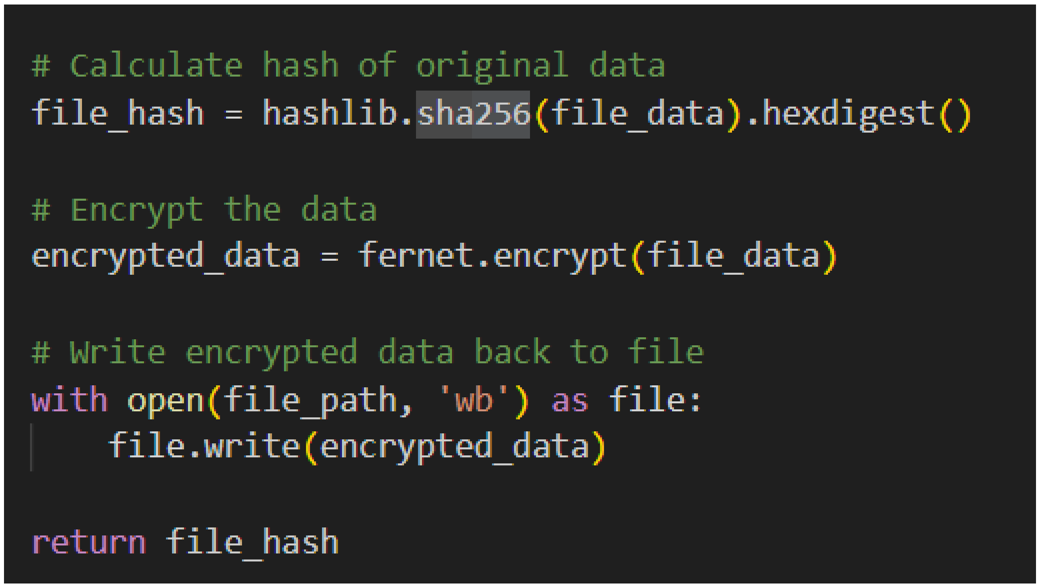
This file is already shared with **TestUser2**. Do you want to share it again? If so, click "Share Anyway."

Username to Share With: TestUser2

- Prevent unauthorized access

File Integrity Checks

- SHA256 hash generation



```
# Calculate hash of original data
file_hash = hashlib.sha256(file_data).hexdigest()

# Encrypt the data
encrypted_data = fernet.encrypt(file_data)

# Write encrypted data back to file
with open(file_path, 'wb') as file:
    file.write(encrypted_data)

return file_hash
```

- Verification during file upload and download
- Detects file tampering

Installation

Software Requirements

Python 3.8+
Django 3.2+
pip package manager

Required Dependencies

1. Django
2. python-dotenv
3. cryptography

Installation Dependencies

Run the following command to install dependencies:

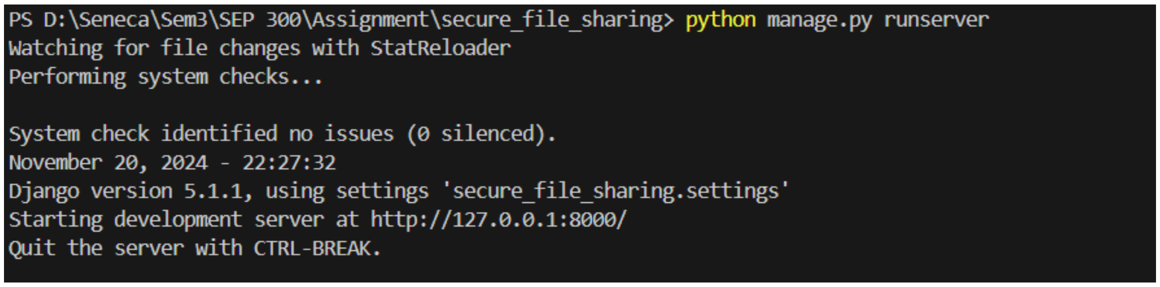
```
pip install django  cryptography python-dotenv
```

Run Development Server

To run the server, use the following command:

```
python manage.py runserver
```

After running the command, you should see output similar to this:



```
PS D:\Seneca\Sem3\SEP 300\Assignment\secure_file_sharing> python manage.py runserver
Watching for file changes with StatReloader
Performing system checks...

System check identified no issues (0 silenced).
November 20, 2024 - 22:27:32
Django version 5.1.1, using settings 'secure_file_sharing.settings'
Starting development server at http://127.0.0.1:8000/
Quit the server with CTRL-BREAK.
```

Edge Cases – Demo Videos for all different cases are uploaded on the repository.