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from flask import Flask, request, send_file, render_template_string
from Crypto.Cipher import AES
from Crypto.Random import get_random_bytes
import os

app = Flask(__name__)
UPLOAD_FOLDER = "uploads"
ENCRYPTED_FOLDER = "encrypted"

os.makedirs(UPLOAD_FOLDER, exist_ok=True)
os.makedirs(ENCRYPTED_FOLDER, exist_ok=True)

KEY = get_random_bytes(16)  # AES-128 key

html = """
<h2>Secure File Sharing System</h2>
<form method="POST" enctype="multipart/form-data">
  <input type="file" name="file">
  <input type="submit" value="Upload & Encrypt">
</form>
{% if filename %}
<p>Encrypted file: {{filename}}</p>
<a href="/download/{{filename}}">Download Decrypted File</a>
{% endif %}
"""

def encrypt_file(input_file, output_file):
    cipher = AES.new(KEY, AES.MODE_EAX)
    data = input_file.read()
    ciphertext, tag = cipher.encrypt_and_digest(data)
    with open(output_file, "wb") as f:
        f.write(cipher.nonce + tag + ciphertext)

def decrypt_file(input_file, output_file):
    data = input_file.read()
    nonce = data[:16]
    tag = data[16:32]
    ciphertext = data[32:]
    cipher = AES.new(KEY, AES.MODE_EAX, nonce)
    decrypted = cipher.decrypt_and_verify(ciphertext, tag)
    with open(output_file, "wb") as f:
        f.write(decrypted)

@app.route("/", methods=["GET", "POST"])
def upload():
    filename = None
    if request.method == "POST":
        file = request.files["file"]
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        filename = file.filename
        encrypted_path = os.path.join(ENCRYPTED_FOLDER, filename)
        encrypt_file(file, encrypted_path)
    return render_template_string(html, filename=filename)

@app.route("/download/<filename>")
def download(filename):
    encrypted_path = os.path.join(ENCRYPTED_FOLDER, filename)
    decrypted_path = os.path.join(UPLOAD_FOLDER, filename)

    with open(encrypted_path, "rb") as f:
        decrypt_file(f, decrypted_path)

    return send_file(decrypted_path, as_attachment=True)

if __name__ == "__main__":
    app.run(debug=True)
```