BLOG POST APPLICATION - STATIC ANALYSIS REPORT

Software Quality Engineering

(SE-G)

Submitted by

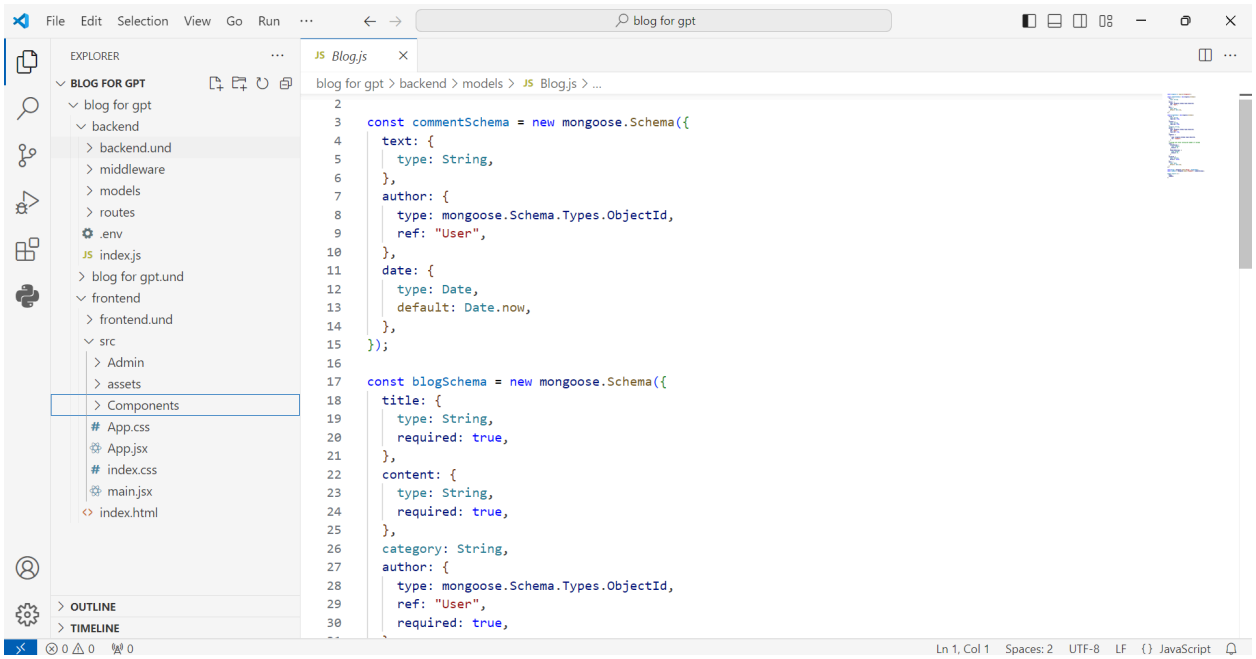
Amna Shahid (21I-1148)
Fatima Qurban (21I-1195)
Ushna Nadeem (21I-1225)

Submitted to

Ma’am Saba Kanwal

Report

Directory Structure



The project(Blog Post Application) has a well-structured layout. Here's a quick breakdown:

Backend

Each directory has different files:

- **Middleware:** It contains authmiddleware.js.
- **Models:** It contains Blog.js and User.js.
- **Routes:** This directory includes following files
    - adminRoutes.js
    - blogRoutes.js
    - searchRoutes.js
    - userRoutes.js
- **Main Backend Entry Point:** index.js.

Frontend

- **Main Files:** App.jsx, main.jsx, App.css, and index.css.
- **Components Directory:** It includes React components in further directories.
- **Assets Directory:** For media, icons, or images.

Static Analysis

authmiddleware.js

The **authmiddleware.js** file implements JWT-based authentication middleware.

Code Summary

- **Purpose:** Acts as a Middleware to authenticate API requests.
- **Operations Performed:**
    1. **Token Extraction:** Retrieves the JWT from req.cookies.jwt.
    2. **Validation:** Checks if the token exists.
    3. **Verification:** Uses jsonwebtoken to decode the token with JWT_SECRET.
    4. **Error Handling:** Returns a “401” Unauthorized error if the token is missing or invalid.

General Observations

Following are the strengths and issues of the project:

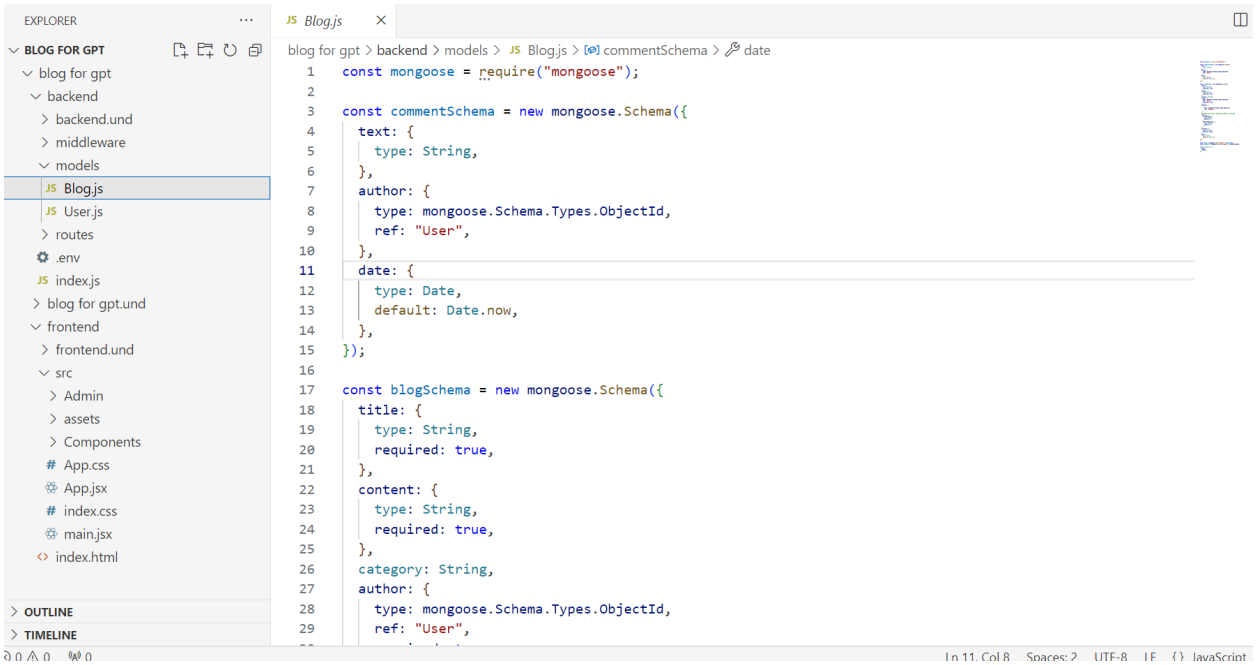
1. **Strengths:**
    - Proper usage of environment variables (process.env.JWT_SECRET) for secret key management.

- Handles missing tokens gracefully by returning an appropriate error message.
- Passes the decoded user information (req.user) to the next middleware.

2. **Potential Issues:**
   - **Error Specificity:** The 401 Unauthorized response is verygeneric and could be enhanced to differentiate between missing tokens and invalid tokens.
   - **No Token Expiry Check:** The middleware does not check if the token has expired, which is critical for security.
   - **No Revocation Logic:** There's no handling for token revocation (e.g., logout scenario).

Schema Structure

Blog.js



The **Blog.js** file defines the schema for blog posts using Mongoose.

Code Summary

- **Purpose:** Defines the structure and relationships for blog posts in the MongoDB database.

- **Key Features:**
    - **Schema for Comments:** A nested schema for comments, including text, author, and date.
    - **Blog Schema:** Contains fields like title, content, category, author, and comments.
    - **Relationships:**
        - References the User model for authors and comment authors.
    - **Default Values:** Sets a default Date.now for comment dates.

General Observations

Following are the strengths and issues of the project:

1. **Strengths:**
    - The use of "User" ensures relational integrity by linking blogs and comments to users.
    - The schema is well-structured and includes necessary fields for basic blog functionality.

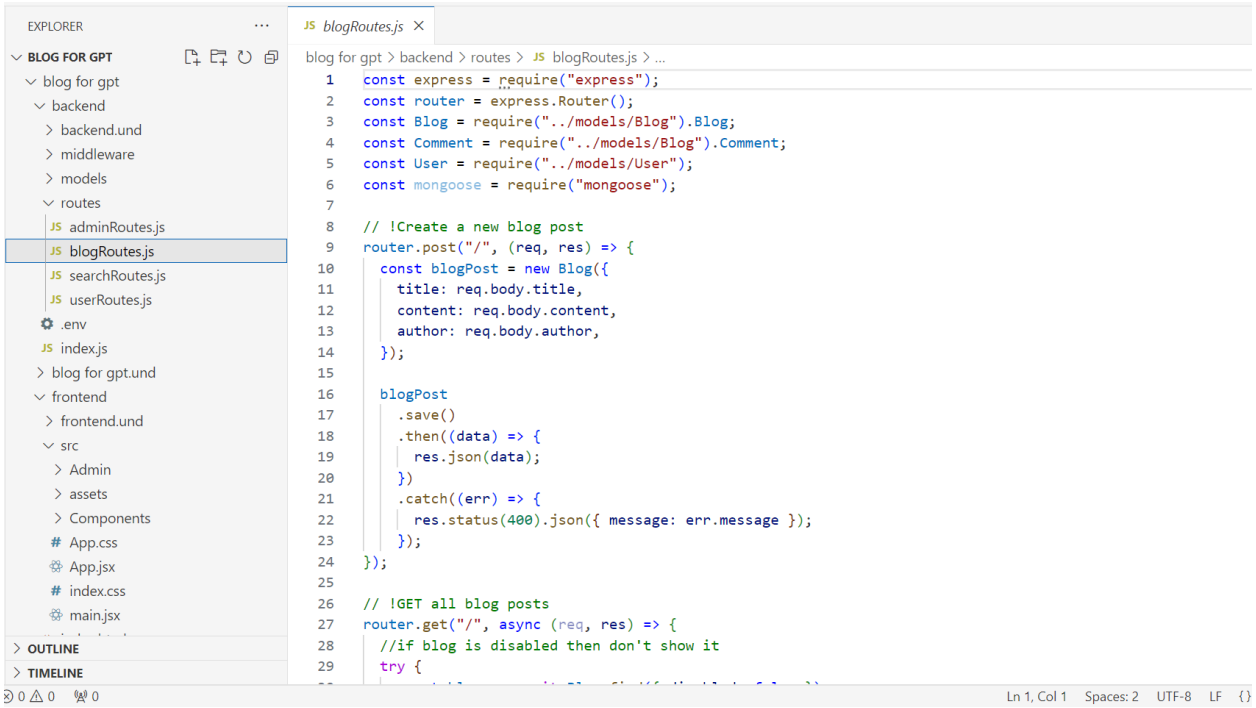
2. **Potential Issues:**
    - **Validation:**
        - Basic validation is present (e.g., “required: true” for title and content), but there's no further validation for length or acceptable characters.
    - **Security Concerns:**
        - content and title fields may be susceptible to XSS attacks if user input is not sanitized during insertion or retrieval.
    - **Comment Schema Flexibility:**
        - Comments do not enforce a required text field, which could result in empty or incomplete records.

Recommendations

1. Add field-level validation for title and content (e.g., min/max length, acceptable characters).
2. Implement middleware or a plugin to sanitize user inputs before saving to the database.

3. Ensure the comments array includes validation to prevent incomplete comment records.

blogRoutes.js



The **blogRoutes.js** file handles routes related to blog operations

Code Summary

- **Purpose:** Defines routes for creating, retrieving, and managing blog posts.
- **Key Features:**
  - **Create Route (POST /):** Allows users to create a new blog post.
  - **Database Operations:**
    - Saves a new blog post to the database.
    - Uses the Blog model to handle CRUD operations.
  - **Request Handling:**
    - Extracts data from req.body for blog creation.

Manual Observations

1. **Strengths:**
   - Uses the Blog model to interact with the database, adhering to a structured MVC approach.

- Sends a JSON response containing the saved blog post, which is useful for API consumers.

2. **Potential Issues:**
    - **Input Validation:**
        - There is no validation or sanitization for “req.body” fields like title, content, and author, making the route vulnerable to:
        - **SQL Injection-like Attacks** (although using MongoDB).
    - **Error Handling:**
        - The catch block for save() is missing or incomplete. Any database errors would result in an unhandled rejection.
    - **Database Overhead:**
        - Large inputs for content are not restricted, potentially leading to storage or performance issues.

Recommendations

1. Add middleware to validate and sanitize req.body fields.
    - Example: Use libraries like express-validator etc.
2. Implement comprehensive error handling:
    - Include a catch block for database save failures.
    - Return appropriate HTTP status codes (e.g., 400 for bad requests, 500 for server errors).
3. Restrict content size to a reasonable length to prevent storage abuse.