Python Assessment Test

Objective

The objective of this assessment is to evaluate your skills in building a RESTful API using FastAPI, integrating it with a PostgreSQL database, and deploying it using Docker. Additionally, you will implement authentication and caching mechanisms.

Requirements

1. **FastAPI Application**:
    - Create a FastAPI application that supports CRUD (Create, Read, Update, Delete) operations for blog posts.
    - Use Pydantic models for data validation.
2. **PostgreSQL Integration**:
    - Connect the FastAPI application to a PostgreSQL database.
    - Define database models for blog posts and users.
3. **Authentication**:
    - Implement user registration and login functionality using OAuth2 with JWT.
    - Protect CRUD operations so that only authenticated users can perform these actions.
4. **Caching**:
    - Implement caching for read operations using a caching service like Redis.
5. **Docker Deployment**:
    - Containerize the application using Docker.
    - Use Docker Compose to manage multiple containers (e.g., FastAPI app, PostgreSQL, Redis).
6. **Nginx Configuration**:
    - Configure Nginx as a reverse proxy to serve the FastAPI application.
7. **Testing**:
    - Write unit tests for the application using Pytest.
    - Ensure tests cover authentication, CRUD operations, and caching functionality.

Deliverables

1. **Codebase**: The complete code for the FastAPI application, including database models, authentication, caching, and Docker configuration.
2. **Docker Configuration**: Dockerfile and docker-compose.yml files.
3. **Nginx Configuration**: Nginx configuration file.
4. **Test Suite**: Pytest tests for authentication, CRUD operations, and caching.
5. **README.md**: A README file with instructions on how to build, run, and test the application.

Evaluation Criteria

- Correctness and completeness of the code.
- Proper use of FastAPI, PostgreSQL, and Docker.
- Effective implementation of authentication and caching.
- Quality of tests and test coverage.
- Clarity and completeness of the README file.