

# **Project Report: Secure Phone Book REST API**

## **Overview**

The Secure Phone Book REST API is designed to manage a phone book database securely. It allows for operations such as adding, listing, and deleting contacts. The application enforces authentication, ensures data validation, and logs all significant actions to maintain security and integrity.

## **Technology Stack**

- Programming Language: Python 3.9
- Web Framework: FastAPI
- Database: SQLite (using SQLAlchemy for ORM)
- Authentication: OAuth2 with JSON Web Tokens (JWTs)
- Password Hashing: bcrypt via passlib library
- Additional Libraries: jose (for JWT encoding and decoding)

## **Setup Instructions**

### **Prerequisites**

1. Python 3.9: Ensure Python 3.9 is installed on your system. You can download it from [python.org](https://www.python.org/downloads/).
2. Pip: Ensure that pip is installed along with Python.

## Installation Steps

1. Clone the Repository: Assuming the code is hosted on a platform like GitHub, clone it using:

```
git clone https://github.com/yourusername/phonebook-api.git  
  
cd phonebook-api
```

2. Install Dependencies: Install the required Python libraries:

```
pip install -r requirements.txt
```

3. Environment Variables: Create a `.env` file in the root directory of the project (if not using Docker) or ensure environment variables are set correctly in the Docker setup. The `.env` file should include:

```
DATABASE_URL=sqlite:///./phonebook.db  
  
SECRET_KEY=your_secret_key  
  
ALGORITHM=HS256  
  
ACCESS_TOKEN_EXPIRE_MINUTES=30
```

## Running the Application

1. Start the Server:

```
uvicorn app:app --reload
```

This command starts the application with live reloading enabled.

2. Accessing the Application:

- The API will be available at `http://127.0.0.1:8000`.
- API documentation generated by FastAPI can be accessed via `http://127.0.0.1:8000/docs`.

## Using the Application

### Authentication

To use the protected endpoints, you must first authenticate and obtain a token:

#### 1. Login:

```
curl -X 'POST' \  
  'http://127.0.0.1:8000/token' \  
  -H 'accept: application/json' \  
  -H 'Content-Type: application/x-www-form-urlencoded' \  
  -d 'username=YOUR_USERNAME&password=YOUR_PASSWORD'
```

Replace `YOUR\_USERNAME` and `YOUR\_PASSWORD` with your credentials.

#### 2. Use the token\*\* in the `Authorization` header for subsequent requests:

```
curl -X 'GET' \  
  'http://127.0.0.1:8000/contacts/' \  
  -H 'accept: application/json' \  
  -H 'Authorization: Bearer YOUR_TOKEN'
```

### CRUD Operations

#### - Add a Contact:

```
curl -X 'POST' \  
  'http://127.0.0.1:8000/contacts/' \  
  -H 'accept: application/json' \  
  -H 'Content-Type: application/json' \  
  -H 'Authorization: Bearer YOUR_TOKEN'
```

```
-d '{  
  "name": "John Doe",  
  "phone_number": "+1234567890"  
}'
```

#### **- List Contacts:**

```
curl -X 'GET' \  
  'http://127.0.0.1:8000/contacts/' \  
  -H 'accept: application/json' \  
  -H 'Authorization: Bearer YOUR_TOKEN'
```

#### **- Delete a Contact:**

```
curl -X 'DELETE' \  
  'http://127.0.0.1:8000/contacts/{contact_id}' \  
  -H 'accept: application/json' \  
  -H 'Authorization: Bearer YOUR_TOKEN'
```

Replace `{contact\_id}` with the ID of the contact to delete.

## **Conclusion**

The Secure Phone Book REST API provides a robust solution for managing contact information securely. It leverages modern security practices including JWT for authentication and SQLAlchemy for secure database interaction.