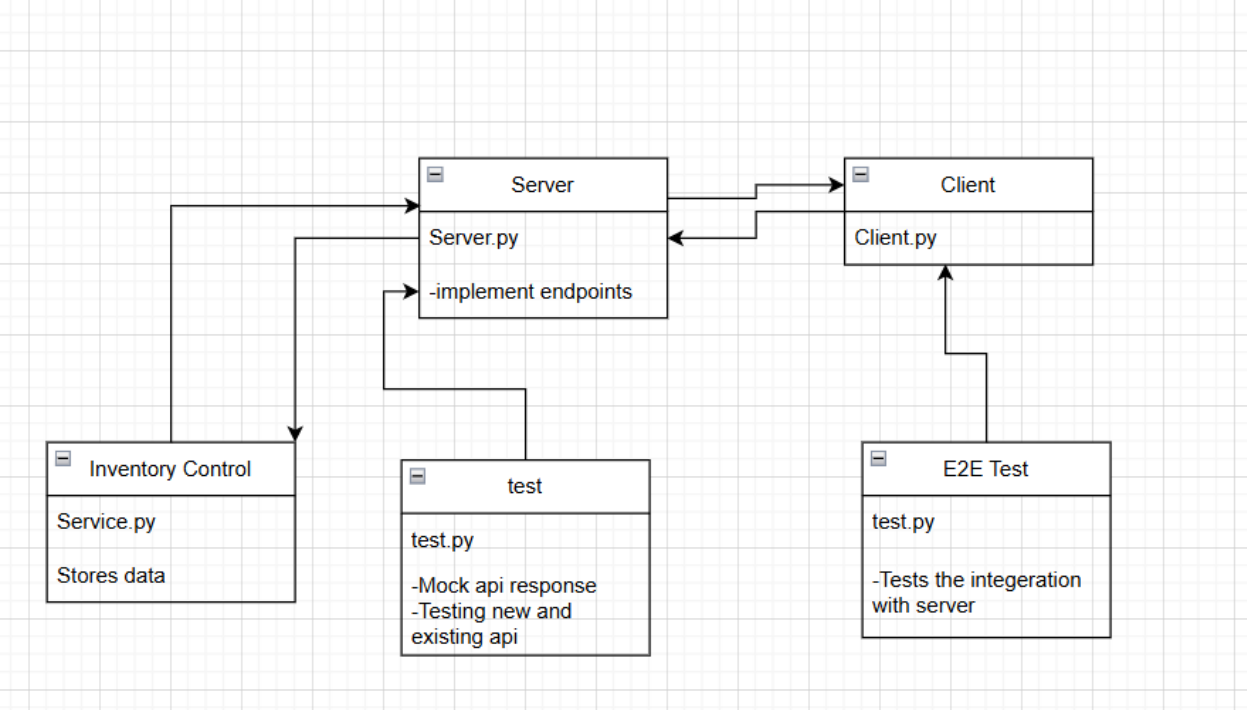
Name: Syed Shah
NUID: 002459070

Design Document

Illustration of Your Design

The repository structure for the A1BaselineRPCServer project is as follows:



The components of this project are:

1. **service.py**: Contains core logic to handle and process requests.
2. **server.py**: Manages server lifecycle (start/stop) and integrates with service.py.
3. **client.py**: Implements client-side logic to send requests and receive responses from the server.
4. **test_client.py**: Tests the client-server interaction.
5. **test_e2e.py**: Performs end-to-end integration testing.
6. **Dockerfile** and **docker-compose.yml**: Define Docker images and containers for deployment.
7. **.github/workflows/ci.yml**: Configures a CI pipeline for automated testing and validation.

8. **requirements.txt**: Lists Python dependencies required for the project.

Benefits of the Design

- **Modularity**: Clear separation of responsibilities into server, client, and service.
- **Testability**: Separate testing modules for client-server and end-to-end testing.
- **Deployability**: Docker configurations simplify deployment.
- **Automation**: CI pipeline ensures reliable and automated validation.

Drawbacks of the Design

- **Complexity**: Multiple components and configurations might be challenging for beginners.
- **Dependency on Docker**: Requires users to have Docker installed and configured.
- **Potential Redundancy**: Overhead in maintaining separate testing scripts for client-server and e2e.

Value of the Benefits

- **Scalability**: Modular design ensures scalability for future enhancements.
- **Reliability**: Automated tests and CI pipeline improve software reliability and reduce manual effort.
- **Ease of Deployment**: Docker simplifies cross-environment deployment.

Impact of the Drawbacks

- **Learning Curve**: Beginners might need additional time to understand the structure.
- **Dependency Management**: Users must manage dependencies and environment setup carefully.

Value Analysis

The design provides a balance between modularity, testability, and deployability. While there are drawbacks, they are outweighed by the benefits, especially for a professional project with CI integration and Docker support.