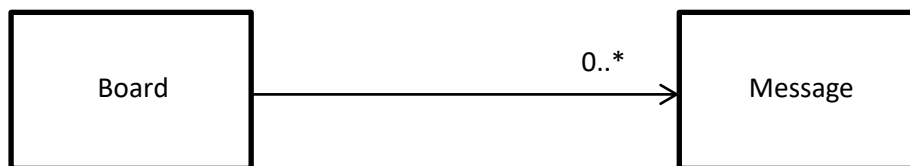# Final Report

1. Introduction Summary

The Login-Free Message Board (NMB) is a web application which enables users to create their own message board, share a link with other users and write message in a collaborative way. Every user can post new messages or edit existing messages - although if they were written by other users.

Features

- Users can create boards (without registration or login)
- Boards can be shared by their unique link
- Users can write messages to the board
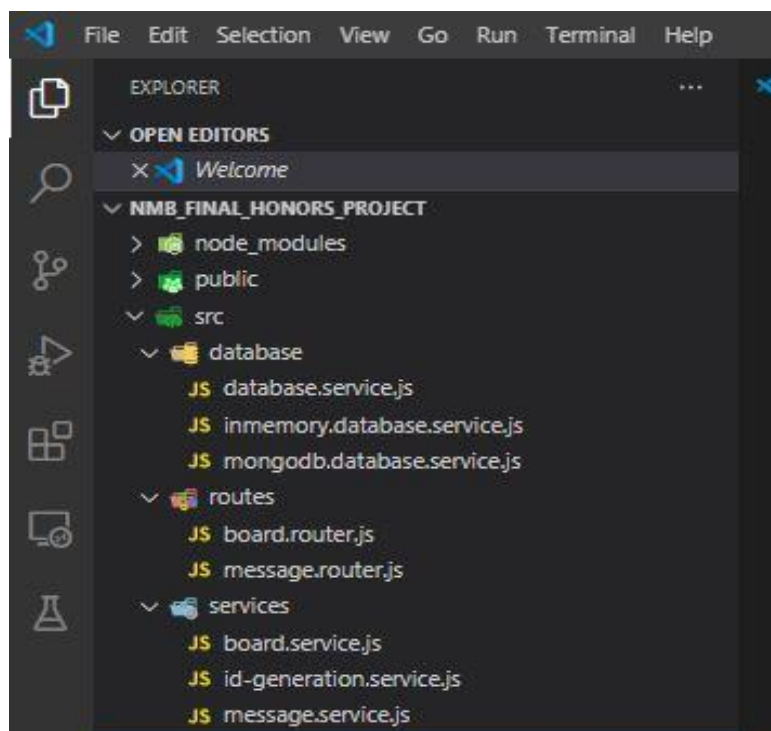- Every user can edit, delete or vote on every message

2. Design and Implementation

System Design The system is design around the data model of boards and messages. The system contains multiple boards which can be created by the users. Each board contains multiple messages. A message can be edited or deleted by anyone who has access to the board.
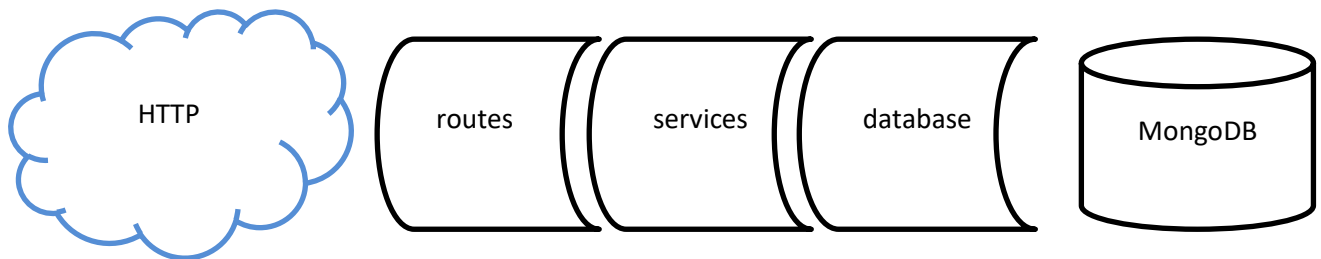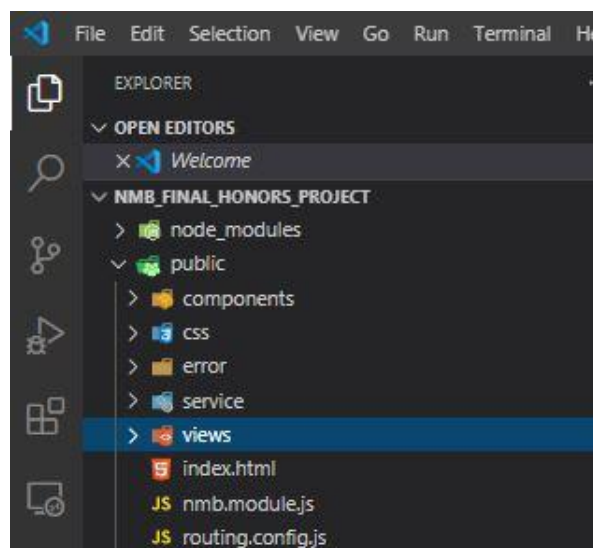

Implementation
Backend

The backend is organized around 3 main packages:

- **"database"** contains the storage layer, especially all interactions with MongoDB. Only this package know how the data is persisted. It encapsulates all storage operations. It also contains a mock implementation which runs without MongoDB but stores all data in-memory.
- **"routes"** contains all REST endpoints. Those endpoints define the URLs and HTTP methods to interact with the backend. There's a separate router for each data model.
- **"services"** contains helper services and business logic. This package stands between the REST endpoints ("routes") and the database layer ("database").

Frontend

The frontend is based on components which have been introduced in AngularJS 1.5. A component concludes controller and HTML partial to a new HTML element. This is useful to encapsulate behavior in single independent modules.

Libraries

- AngularJS as frontend library to implement the single page application
- Bootstrap CSS to design the application
- LodashJS for operation on arrays and objects (map, filter, find, reduce)
- Mocha, Chai and Sinon to write unit test for the backend
- Log4js to do logging