CSE 586 Distributed Systems

Phase 1

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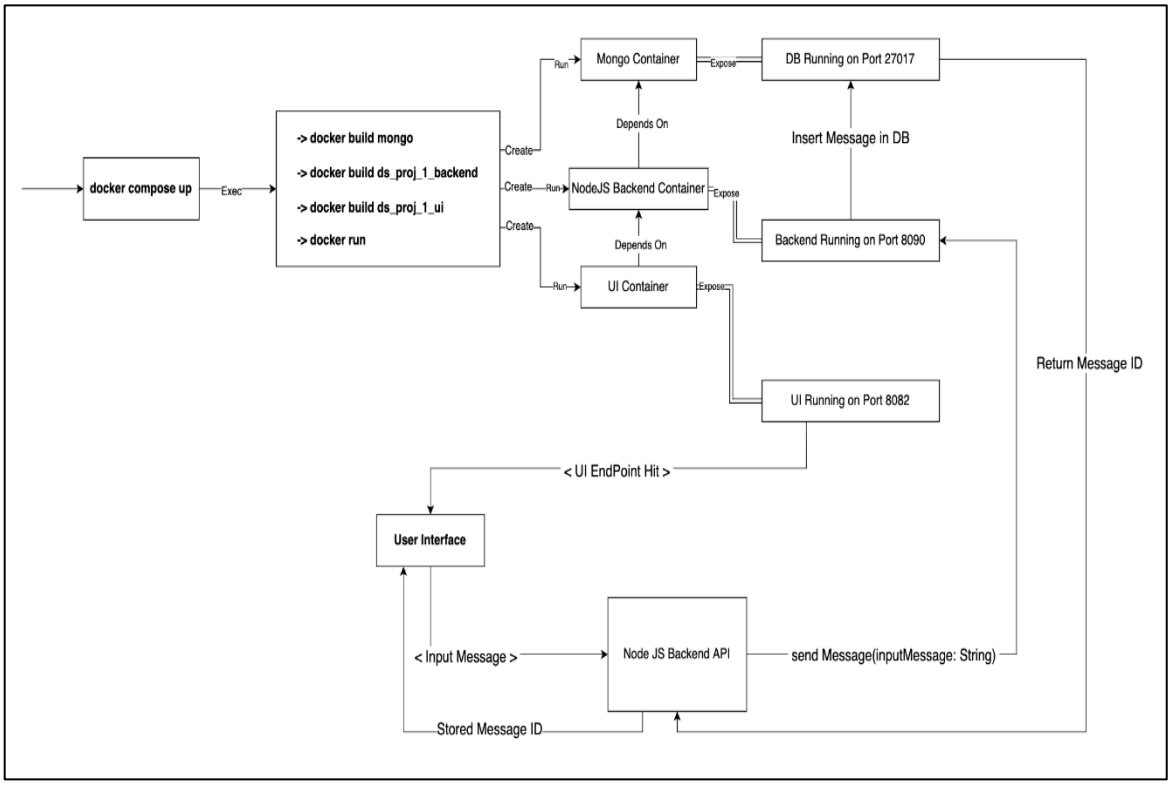
1. Introduction

The objective of this project phase is to demonstrate client server interaction logic, learn Docker basics and Docker containers. So, we have implemented a container orchestration of Client-Server application in Docker that bundles the Client-Server logic. It is a simple web application that takes a message from user through a HTML textbox field and then stores it in database (local MongoDB) and returns acknowledgement Id as well. Moreover, the user can also retrieve and view their previous sent messages.

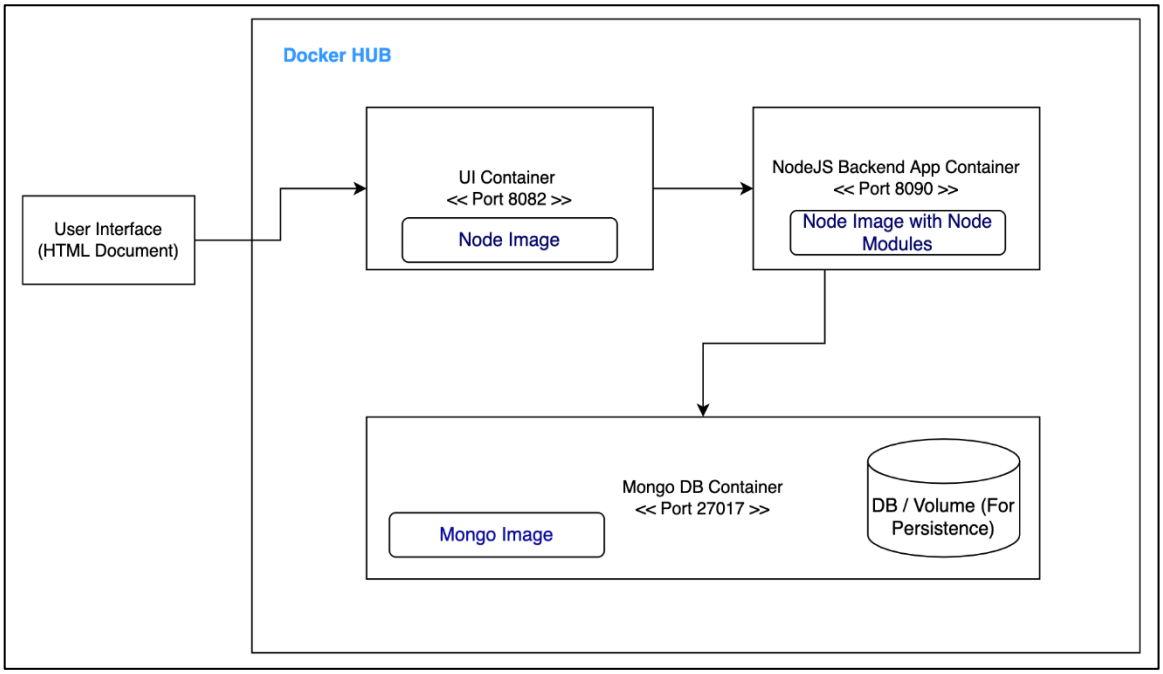
One of the prime reasons to implement this application in Docker is that Virtual Machines are very resource heavy, but Docker containers are much lighter than that of running on a Virtual Machine. Also, Docker is much more easier with respect to implementation of applications.

2. Design Overview

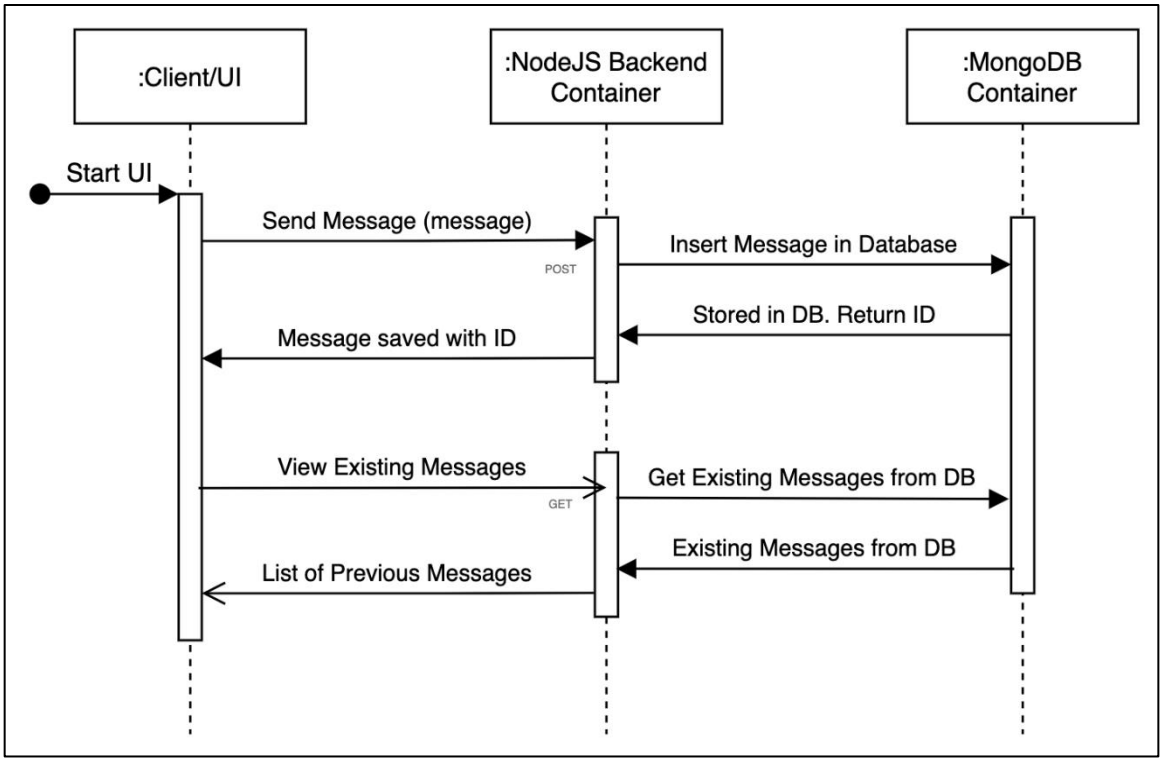
2.1 Block Diagram



2.2 Architecture Diagram



2.3 UML Sequence Diagram

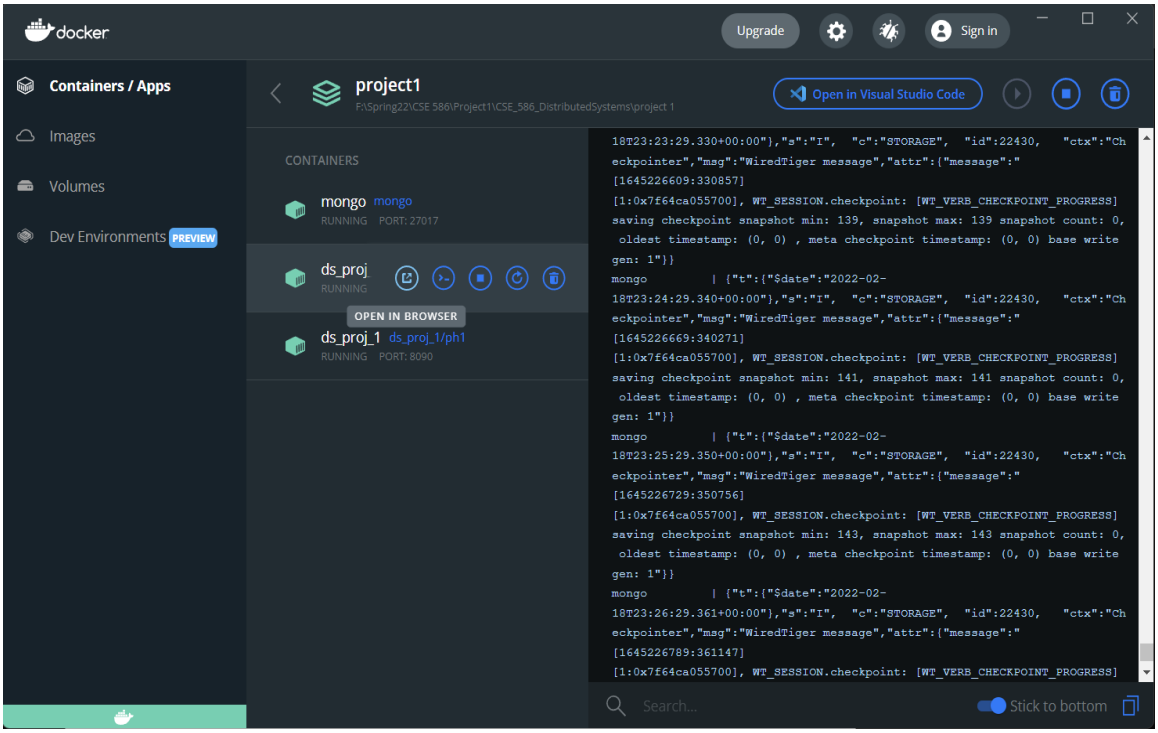


3. Implementation

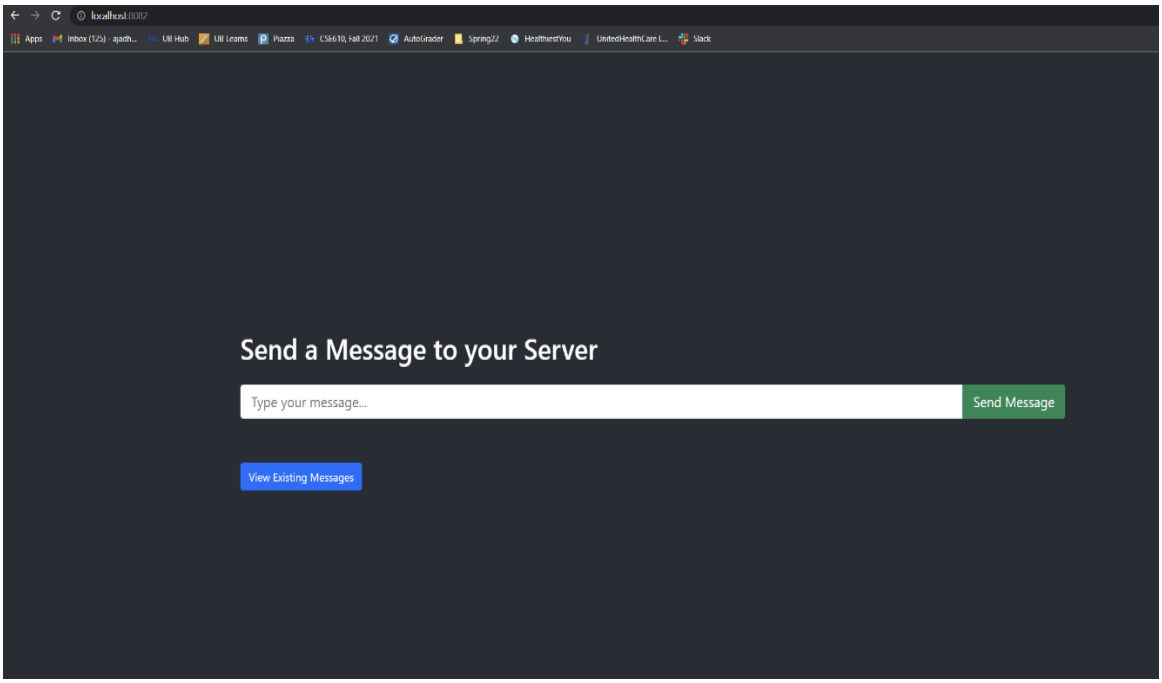
- Downloaded Docker and installed it (faced a lot of problems on Windows systems but after a lot of Googling and research was able to start the Docker Engine).

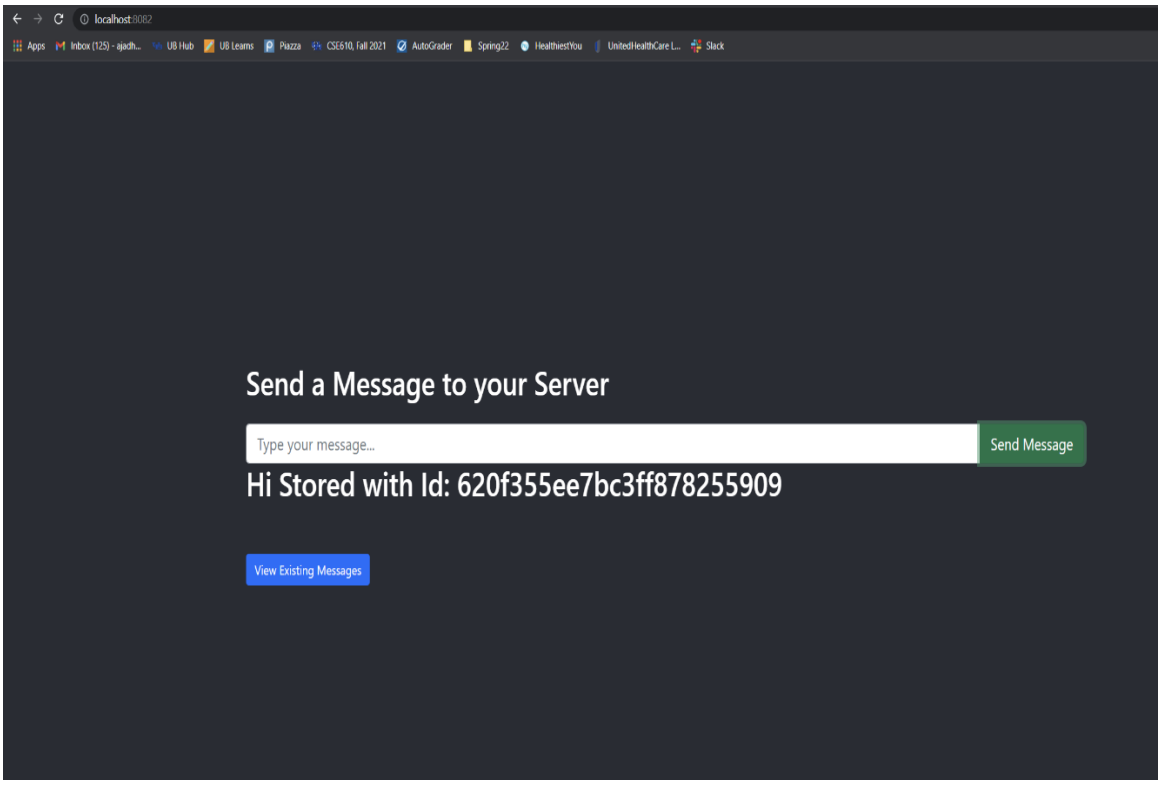
- Initially started with creation of small container Docker applications which just showed static messages but eventually moved forward and implemented a container Docker application that bundles Client-Server logic with Node.js built-in application functionalities and MongoDB database functionalities.

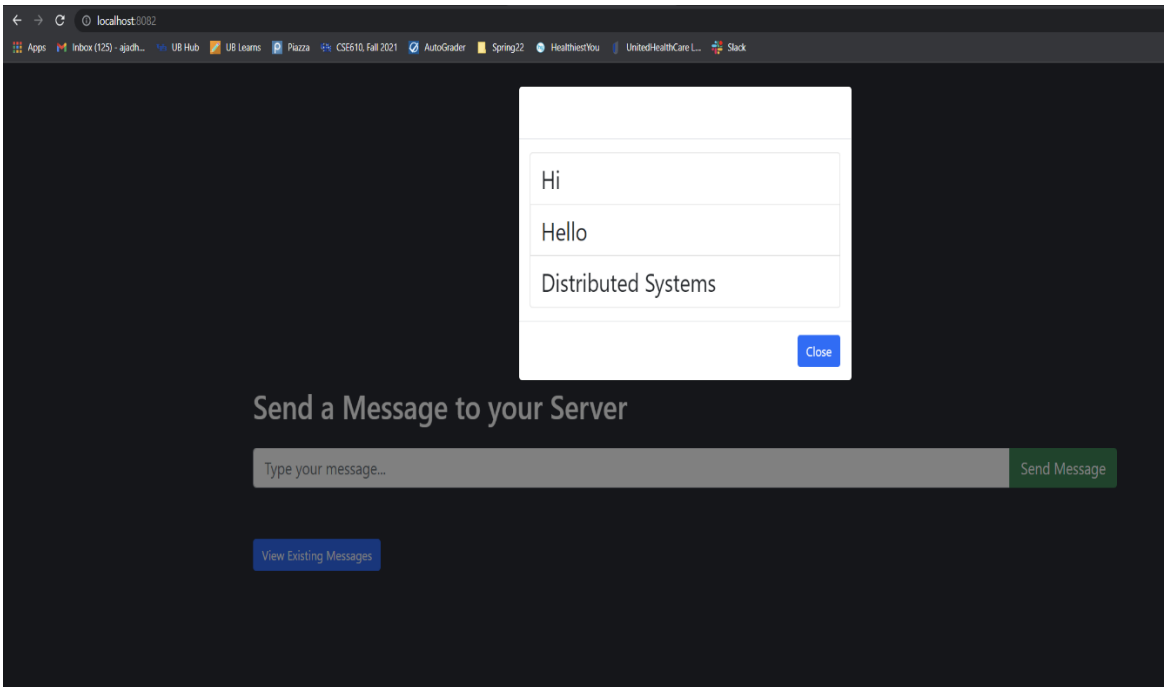
- Implemented containers for every module of the Phase 1 like Frontend, Backend and DB.



- Workflow of the Frontend User Interface of the application:





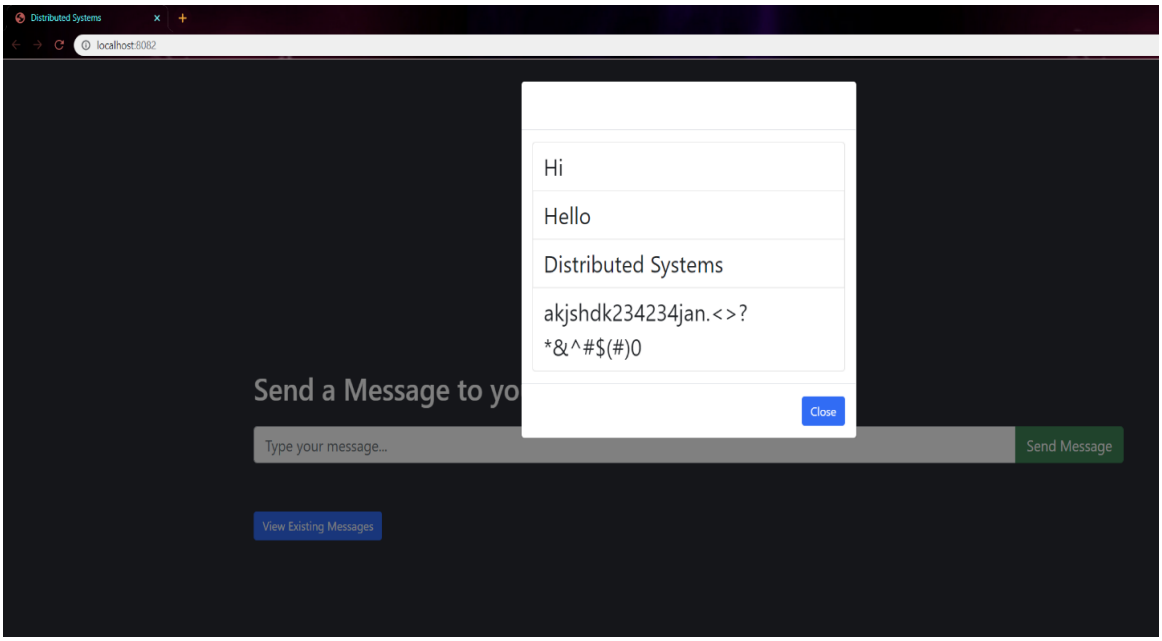


3.1 How to run the App:

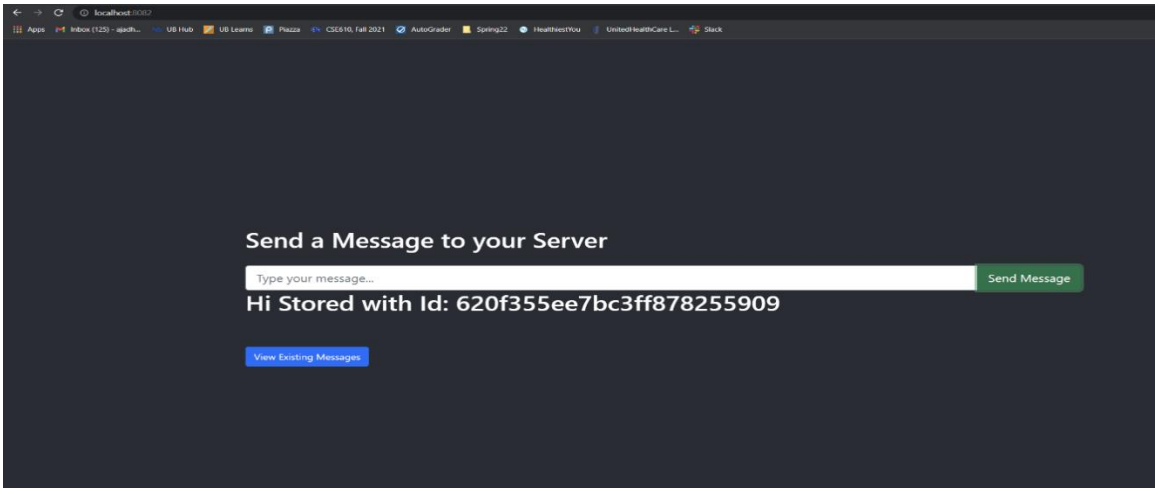
- Download the .zip file and extract it.
- Using terminal go to the directory where the docker-compose.yml file is located which is in project 1 folder.
- Use the command "docker-compose up" to initialize the docker container which runs the app.
- Open the browser and type "**localhost:8082**" where you put a URL or just use "**Open in browser button located next to the web container (ds_proj_1_ui) in Docker desktop application**".

4. Validation

For validation we have done User Acceptance Testing such as if a user inputs any Alphanumeric as well as any special characters the application handles it as a string and stores it in the database.



Moreover, done extensive dry runs and debugged the application code step by step.



5. References

- https://docs.docker.com/
- https://www.tutorialspoint.com/mongodb/index.htm
- https://www.w3schools.com/nodejs/
- https://nodejs.dev/learn/