CSE 586 Project 2 - Team 3

Topic - Food Nutrition Data Notification system with Kafka

Public API Details:

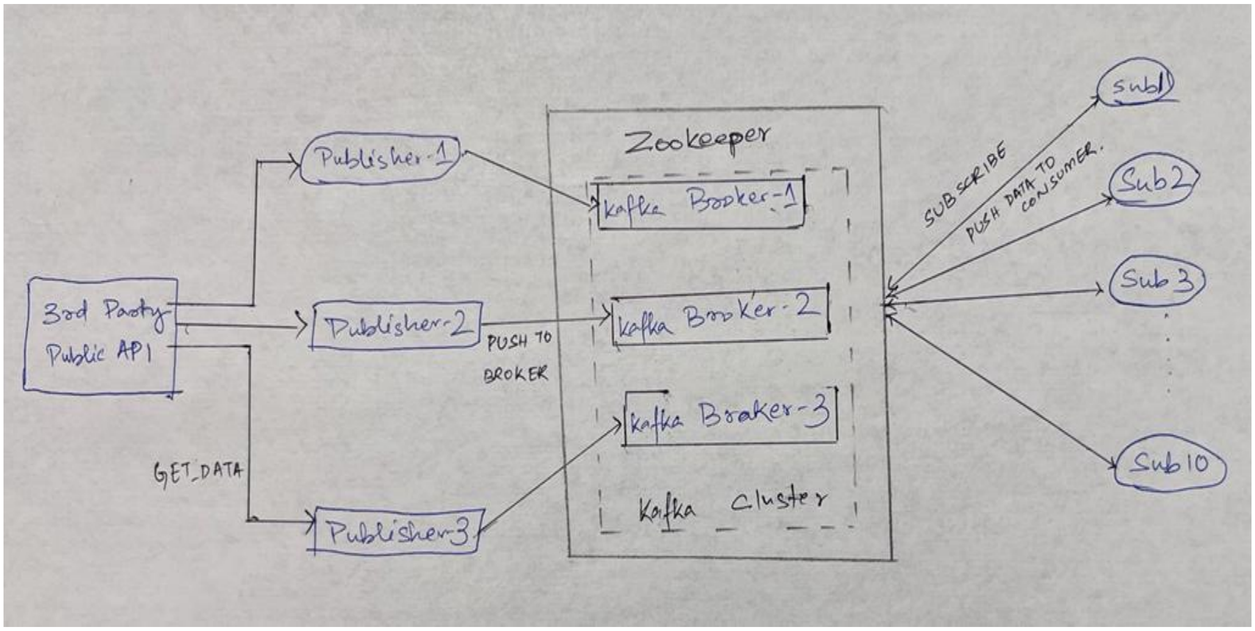
Document Link - API Documentation

Description - Natural language API to extract nutrition data for any food item

Technologies Used:

Middleware	Kafka
Backend	NodeJS with Express and Kafkajs
FrontEnd	NodeJS with ejs templates and and Kafkajs
Platform	Docker
Communication	Kafka Producer and Consumer API

Architecture Diagram:



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Topic-Publisher-Broker Relationship:

Publisher	Broker	Topic
Publisher -1	Kafka - 1	Chicken(partition – 2, replication-3), Fish
Publisher –2	kafka – 2	Beef
Publisher –3	kafka – 3	Pork

Explanation:

Publisher Functionalities:

- Periodically collects data from Public API for the specific topic
- Publisher pushes the collected topic data to the kaka broker using kafka producer API.

Kafka Broker Functionalities:

- Kafka broker is responsible for mediating the conversation between producer and subscribers.
- A kafka cluster is created with 3 kafka brokers in it.
- To maintain the state of the broker Apache Zookeeper is used.
- Zookeeper keeps track of the status of the Kafka cluster nodes, Kafka topics, partitions, etc.
- Zookeeper lets the 3 kafka broker nodes communicate with each other through a shared hierarchical namespace which is organized similarly to a standard file system.
- The subscriber subscribes to a topic by making an API call to the kafka broker using the Kafka consumer APIs.
- Zookeeper handles the routing of the request to the broker node which is responsible for that particular topic.
- Handles the subscription and Unsubscription of topics by subscribers..

Subscriber Functionalities:

- Display all the food details in UI
- Enables the user to subscribe or unsubscribe to a food topic
- Listens to subscriber for incoming data
- Refreshes the data automatically based on notification from the subscriber

Contribution by team members:

Sivakumar Pasupathi(50366350)	Publisher functionalities, Subscriber functionalities
Parthiban Rajendran(50415960)	Broker functionalities, Docker Platform, Documentation
Common Handling	Kafka handling , Applicatiion Integration

Steps to Initialize the program:

- Go to the project root folder in terminal and run the following command :-
    - **docker-compose up**
- Once the program is up, verify all the apps have been initialized by running the following command in terminal:-
    - **docker ps**

ScreenShots:

User Interface

1) **Basic View**

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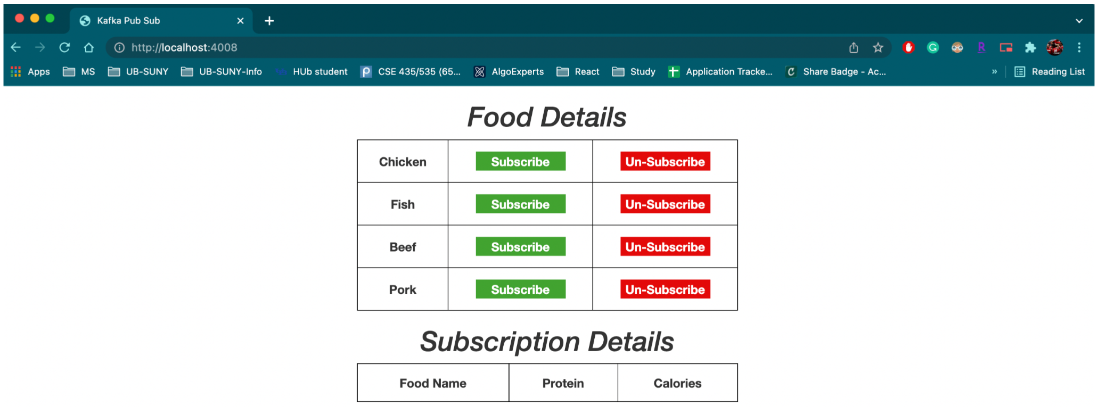


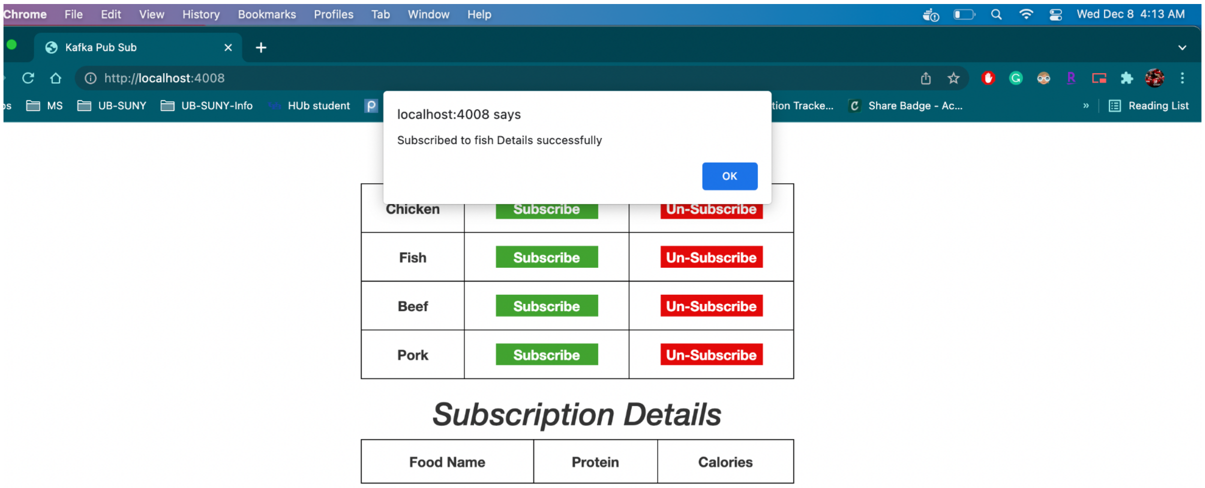
Food Details

Chicken	Subscribe	Un-Subscribe
Fish	Subscribe	Un-Subscribe
Beef	Subscribe	Un-Subscribe
Pork	Subscribe	Un-Subscribe

Subscription Details

Food Name	Protein	Calories

View subscribing to a topic



localhost:4008 says

Subscribed to fish Details successfully

Chicken	Subscribe	Un-Subscribe
Fish	Subscribe	Un-Subscribe
Beef	Subscribe	Un-Subscribe
Pork	Subscribe	Un-Subscribe

Subscription Details

Food Name	Protein	Calories

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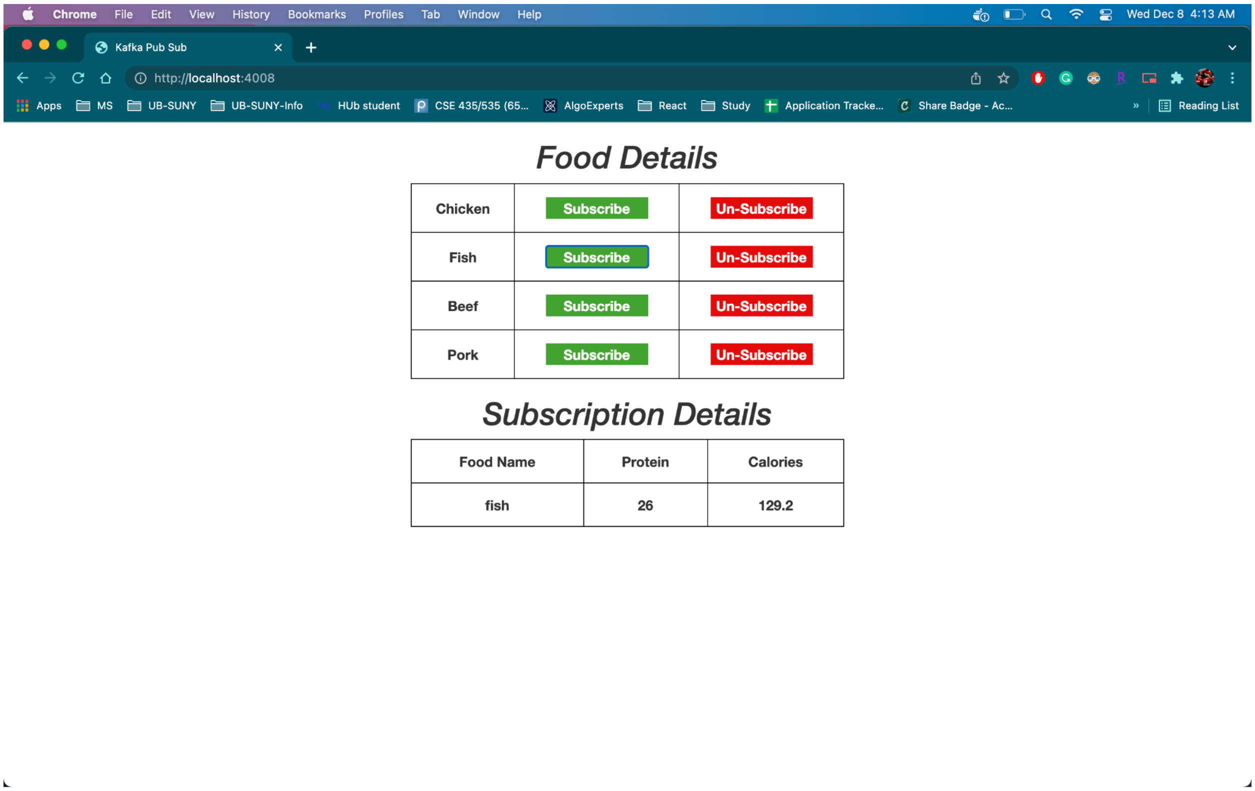


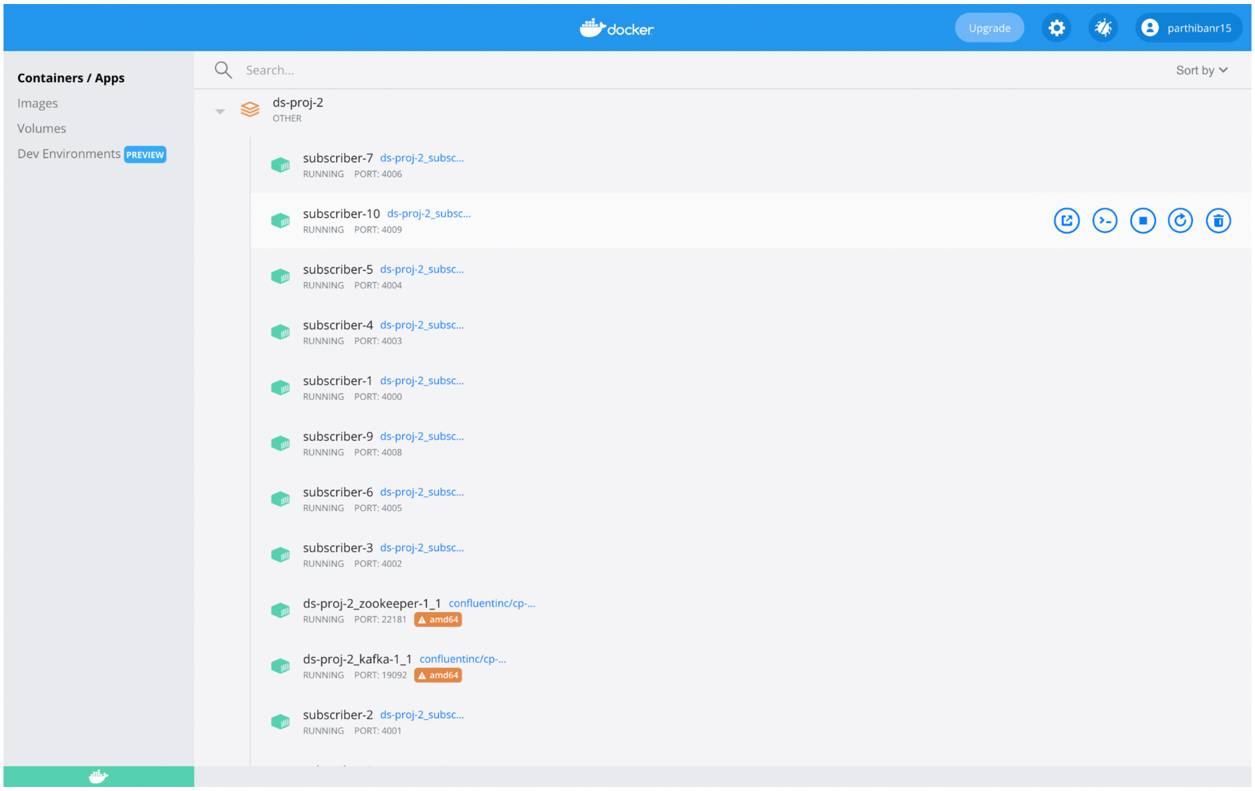
Food Details

Chicken	Subscribe	Un-Subscribe
Fish	Subscribe	Un-Subscribe
Beef	Subscribe	Un-Subscribe
Pork	Subscribe	Un-Subscribe

Subscription Details

Food Name	Protein	Calories
fish	26	129.2

Docker Container Screenshot



ds-proj-2
OTHER

subscriber-7 ds-proj-2_subsc...
RUNNING PORT: 4006

subscriber-10 ds-proj-2_subsc...
RUNNING PORT: 4009

subscriber-5 ds-proj-2_subsc...
RUNNING PORT: 4004

subscriber-4 ds-proj-2_subsc...
RUNNING PORT: 4003

subscriber-1 ds-proj-2_subsc...
RUNNING PORT: 4000

subscriber-9 ds-proj-2_subsc...
RUNNING PORT: 4008

subscriber-6 ds-proj-2_subsc...
RUNNING PORT: 4005

subscriber-3 ds-proj-2_subsc...
RUNNING PORT: 4002

ds-proj-2_zookeeper-1_1 confluentinc/cp-...
RUNNING PORT: 22181 amd64

ds-proj-2_kafka-1_1 confluentinc/cp-...
RUNNING PORT: 19092 amd64

subscriber-2 ds-proj-2_subsc...
RUNNING PORT: 4001

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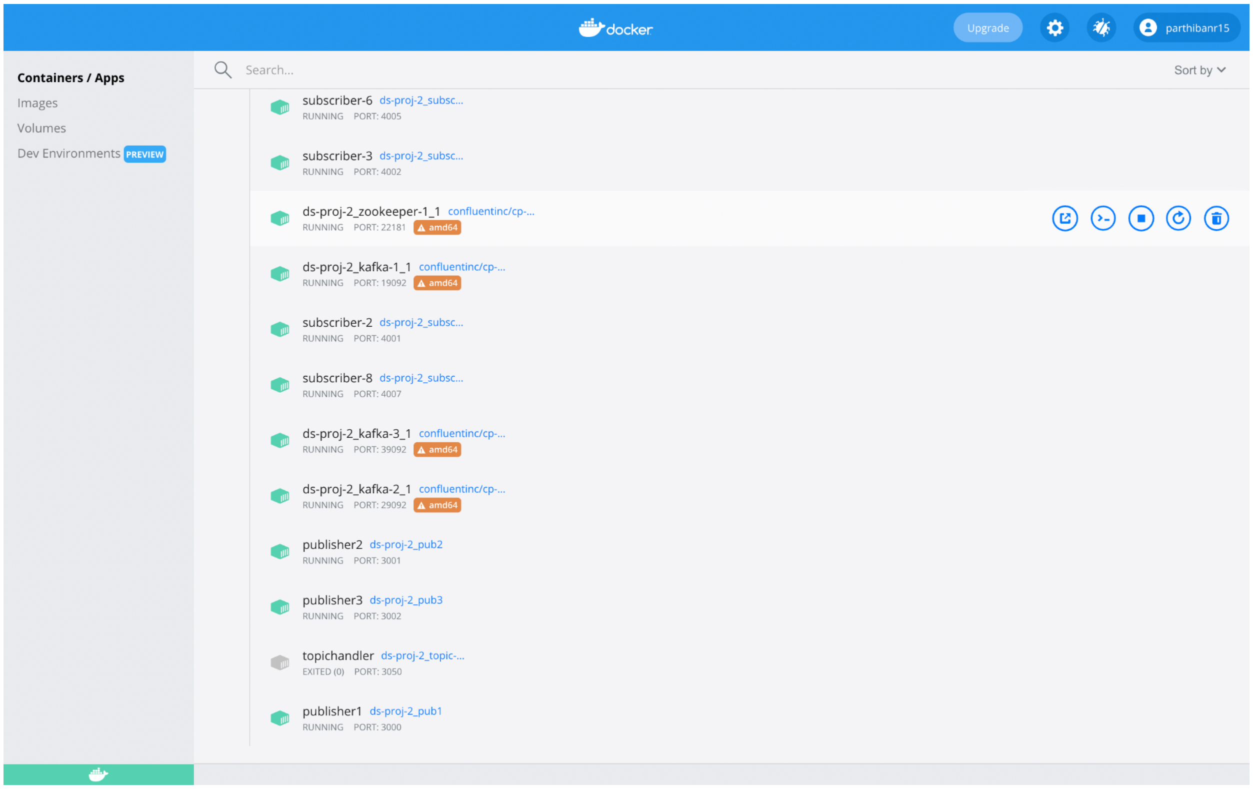


subscriber-6 ds-proj-2_subsc...
RUNNING PORT: 4005

subscriber-3 ds-proj-2_subsc...
RUNNING PORT: 4002

ds-proj-2_zookeeper-1_1 confluentinc/cp-...
RUNNING PORT: 22181 amd64

ds-proj-2_kafka-1_1 confluentinc/cp-...
RUNNING PORT: 19092 amd64

subscriber-2 ds-proj-2_subsc...
RUNNING PORT: 4001

subscriber-8 ds-proj-2_subsc...
RUNNING PORT: 4007

ds-proj-2_kafka-3_1 confluentinc/cp-...
RUNNING PORT: 39092 amd64

ds-proj-2_kafka-2_1 confluentinc/cp-...
RUNNING PORT: 29092 amd64

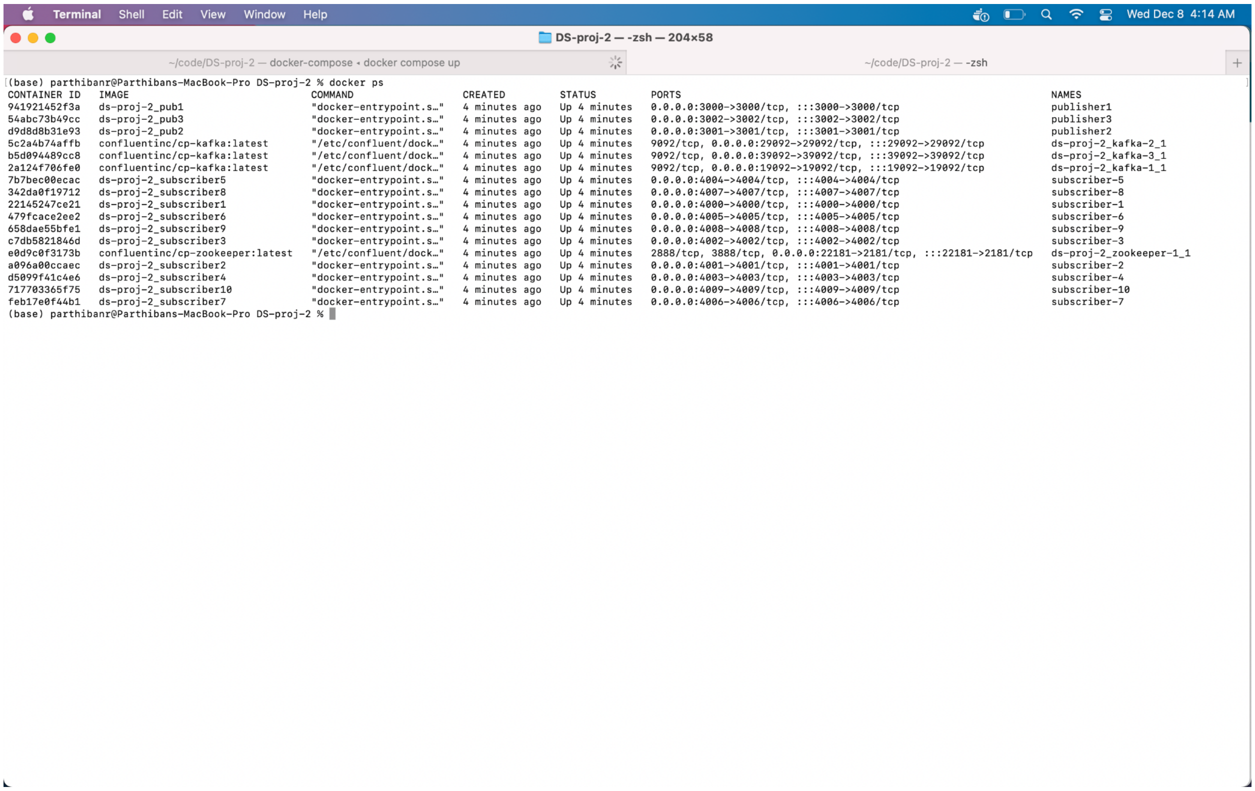
publisher2 ds-proj-2_pub2
RUNNING PORT: 3001

publisher3 ds-proj-2_pub3
RUNNING PORT: 3002

topichandler ds-proj-2_topic-...
EXITED (0) PORT: 3050

publisher1 ds-proj-2_pub1
RUNNING PORT: 3000

Docker ps Terminal


Terminal
Shell
Edit
View
Window
Help
Wed Dec 8 4:14 AM
DS-proj-2 — -zsh — 204×58
~/code/DS-proj-2 — docker-compose ◂ docker compose up
~/code/DS-proj-2 — -zsh

```
(base) parthibanr@Parthibans-MacBook-Pro DS-proj-2 % docker ps
CONTAINER ID   IMAGE                              COMMAND                  CREATED         STATUS         PORTS                                                              NAMES
941921452f3a   ds-proj-2_pub1                     "docker-entrypoint.s…"   4 minutes ago   Up 4 minutes   0.0.0.0:3000->3000/tcp, :::3000->3000/tcp                          publisher1
54abc73b49cc   ds-proj-2_pub3                     "docker-entrypoint.s…"   4 minutes ago   Up 4 minutes   0.0.0.0:3002->3002/tcp, :::3002->3002/tcp                          publisher3
d9d8d8b31e93   ds-proj-2_pub2                     "docker-entrypoint.s…"   4 minutes ago   Up 4 minutes   0.0.0.0:3001->3001/tcp, :::3001->3001/tcp                          publisher2
5c2a4b74affb   confluentinc/cp-kafka:latest       "/etc/confluent/dock…"   4 minutes ago   Up 4 minutes   9092/tcp, 0.0.0.0:29092->29092/tcp, :::29092->29092/tcp            ds-proj-2_kafka-2_1
b5d094489cc8   confluentinc/cp-kafka:latest       "/etc/confluent/dock…"   4 minutes ago   Up 4 minutes   9092/tcp, 0.0.0.0:39092->39092/tcp, :::39092->39092/tcp            ds-proj-2_kafka-3_1
2a124f706fe0   confluentinc/cp-kafka:latest       "/etc/confluent/dock…"   4 minutes ago   Up 4 minutes   9092/tcp, 0.0.0.0:19092->19092/tcp, :::19092->19092/tcp            ds-proj-2_kafka-1_1
7b7bec00ecac   ds-proj-2_subscriber5              "docker-entrypoint.s…"   4 minutes ago   Up 4 minutes   0.0.0.0:4004->4004/tcp, :::4004->4004/tcp                          subscriber-5
342da0f19712   ds-proj-2_subscriber8              "docker-entrypoint.s…"   4 minutes ago   Up 4 minutes   0.0.0.0:4007->4007/tcp, :::4007->4007/tcp                          subscriber-8
22145247ce21   ds-proj-2_subscriber1              "docker-entrypoint.s…"   4 minutes ago   Up 4 minutes   0.0.0.0:4000->4000/tcp, :::4000->4000/tcp                          subscriber-1
479fcace2ee2   ds-proj-2_subscriber6              "docker-entrypoint.s…"   4 minutes ago   Up 4 minutes   0.0.0.0:4005->4005/tcp, :::4005->4005/tcp                          subscriber-6
658dae55bfe1   ds-proj-2_subscriber9              "docker-entrypoint.s…"   4 minutes ago   Up 4 minutes   0.0.0.0:4008->4008/tcp, :::4008->4008/tcp                          subscriber-9
c7db5821846d   ds-proj-2_subscriber3              "docker-entrypoint.s…"   4 minutes ago   Up 4 minutes   0.0.0.0:4002->4002/tcp, :::4002->4002/tcp                          subscriber-3
e0d9c0f3173b   confluentinc/cp-zookeeper:latest   "/etc/confluent/dock…"   4 minutes ago   Up 4 minutes   2888/tcp, 3888/tcp, 0.0.0.0:22181->2181/tcp, :::22181->2181/tcp   ds-proj-2_zookeeper-1_1
a096a00ccaec   ds-proj-2_subscriber2              "docker-entrypoint.s…"   4 minutes ago   Up 4 minutes   0.0.0.0:4001->4001/tcp, :::4001->4001/tcp                          subscriber-2
d5099f41c4e6   ds-proj-2_subscriber4              "docker-entrypoint.s…"   4 minutes ago   Up 4 minutes   0.0.0.0:4003->4003/tcp, :::4003->4003/tcp                          subscriber-4
717703365f75   ds-proj-2_subscriber10             "docker-entrypoint.s…"   4 minutes ago   Up 4 minutes   0.0.0.0:4009->4009/tcp, :::4009->4009/tcp                          subscriber-10
feb17e0f44b1   ds-proj-2_subscriber7              "docker-entrypoint.s…"   4 minutes ago   Up 4 minutes   0.0.0.0:4006->4006/tcp, :::4006->4006/tcp                          subscriber-7
(base) parthibanr@Parthibans-MacBook-Pro DS-proj-2 %
```