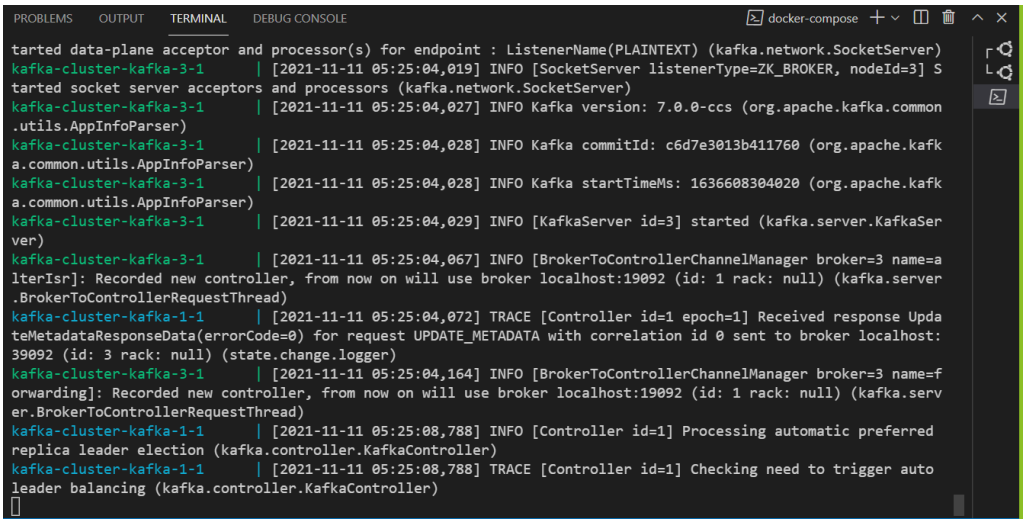
Name: Gordon Foo A0199554L
Link to github repo: https://github.com/gordonfgz/OTOT_TASK_D.git

Followed instructions here:
https://docs.confluent.io/5.0.0/installation/docker/docs/installation/clustered-deployment.html#docker-setup-3-node

How to setup:
first, cd cp-docker-images/examples/kafka-cluster
Then, docker-compose up
You should see the clusters firing up:



Open docker desktop to check that the kafka cluster is up and running with 3 zookeepers and 3 kafka brokers:

Next, create a topic called bar by running the following commands:

1.
```
cd cp-docker-images/examples/kafka-cluster
```
2.
```
docker run \
  --net=host \
  --rm \
  confluentinc/cp-kafka:5.0.0 \
  kafka-topics --create --topic bar --partitions 3 --replication-factor 3 --if-not-exists --zo
okeeper localhost:32181
```

Results:

```
gordonfgz@DESKTOP-0AU805U:/mnt/c/Users/gordo/OneDrive/Desktop/School/CS3219/OTOT_TASK_D$ cd cp-docker-images
gordonfgz@DESKTOP-0AU805U:/mnt/c/Users/gordo/OneDrive/Desktop/School/CS3219/OTOT_TASK_D/cp-docker-images$ cd ex
amples
gordonfgz@DESKTOP-0AU805U:/mnt/c/Users/gordo/OneDrive/Desktop/School/CS3219/OTOT_TASK_D/cp-docker-images/exampl
es$ cd kafka-cluster
gordonfgz@DESKTOP-0AU805U:/mnt/c/Users/gordo/OneDrive/Desktop/School/CS3219/OTOT_TASK_D/cp-docker-images/exampl
es/kafka-cluster$ docker run \
>   --net=host \
>   --rm \
>   confluentinc/cp-kafka:5.0.0 \
fka-topi>   kafka-topics --create --topic bar --partitions 3 --replication-factor 3 --if-not-exists --zookeeper
st:32181s
Created topic "bar".
gordonfgz@DESKTOP-0AU805U:/mnt/c/Users/gordo/OneDrive/Desktop/School/CS3219/OTOT_TASK_D/cp-docker-images/exampl
es/kafka-cluster$
```

Check that it works by describing the topic by running:

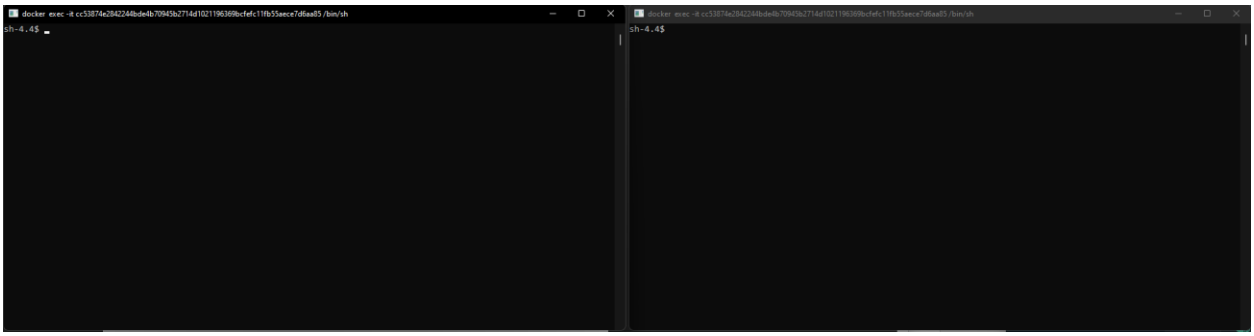
```
docker run \
    --net=host \
    --rm \
    confluentinc/cp-kafka:5.0.0 \
    kafka-topics --describe --topic bar --zookeeper localhost:32181
```

Results:

```
gordonfgz@DESKTOP-0AU805U:/mnt/c/Users/gordo/OneDrive/Desktop/School/CS3219/OTOT_TASK_D/cp-docker-images/exampl
es/kafka-cluster$ docker run \
>     --net=host \
>     --rm \
>     confluentinc/cp-kafka:5.0.0 \
fka-topi>     kafka-topics --describe --topic bar --zookeeper localhost:32181
Topic:bar       PartitionCount:3        ReplicationFactor:3     Configs:
        Topic: bar      Partition: 0    Leader: 1       Replicas: 1,3,2 Isr: 1,3,2
        Topic: bar      Partition: 1    Leader: 2       Replicas: 2,1,3 Isr: 2,1,3
        Topic: bar      Partition: 2    Leader: 3       Replicas: 3,2,1 Isr: 3,2,1
gordonfgz@DESKTOP-0AU805U:/mnt/c/Users/gordo/OneDrive/Desktop/School/CS3219/OTOT_TASK_D/cp-docker-images/exampl
es/kafka-cluster$
```

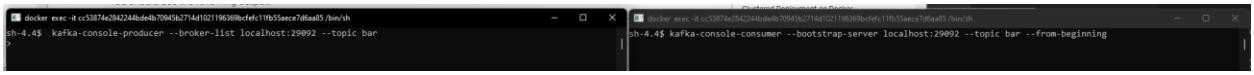
Choose one of the kafka broker, in this example I choose kafka-cluster-kafka-1-1. Open up 2 bash terminals (I did this by clicking the cli button twice):

2 terminals should pop out like this:

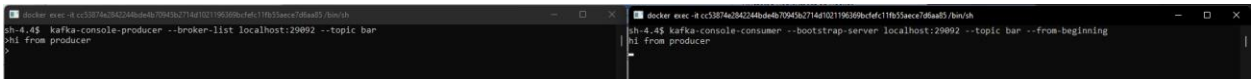


Choose the left one to be producer by running:
kafka-console-producer --broker-list localhost:29092 --topic bar
Choose the right one to be consumer by running:
kafka-console-consumer --bootstrap-server localhost:29092 --topic bar --from-beginning

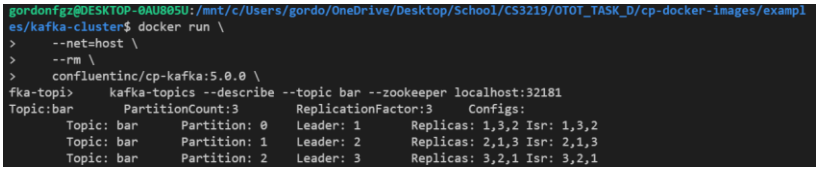
Results:



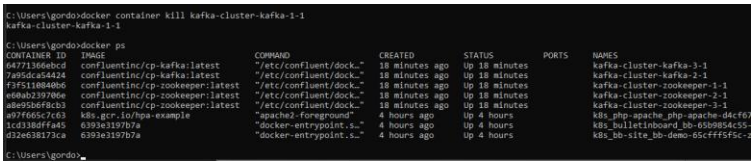
Type “hi from producer” in the producer terminal and enter, and it should come out on the consumer:



Next, moving on to killing a node, I will choose to kill kafka-1-1. From the zookeeper describe call we did previously, it is shown that kafka-1 is the leader of partition 0



Hence I kill kafka-1-1 by running: docker container kill kafka-cluster-kafka-1-1
And verify that there is no more kafka-cluster-kafka-1-1 by running: docker ps



After killing kafka-1-1, I ran zookeeper describe again and the following result shows that partition 0 now have kafka 3 as leader:

```
gordonfgz@DESKTOP-0AU805U:/mnt/c/Users/gordo/OneDrive/Desktop/School/CS3219/OTOT_TASK_D/cp-docker-images/examples/kafka-cluster$ docker run     --net=host     --rm     confluentinc/cp-kafka:5.0.0     kafka-topics --describe --topic bar --zookeeper localhost:32181
Topic:bar       PartitionCount:3        ReplicationFactor:3     Configs:
        Topic: bar      Partition: 0    Leader: 3       Replicas: 1,3,2 Isr: 3,2
        Topic: bar      Partition: 1    Leader: 2       Replicas: 2,1,3 Isr: 2,3
        Topic: bar      Partition: 2    Leader: 3       Replicas: 3,2,1 Isr: 3,2
gordonfgz@DESKTOP-0AU805U:/mnt/c/Users/gordo/OneDrive/Desktop/School/CS3219/OTOT_TASK_D/cp-docker-images/examples/kafka-cluster$
```

Now that I open 2 terminals for kafka-cluster-kafka-2-1 and do the same producer consumer setup, I still get the previous hi from producer: