Unit 4.2 Graded Assignment:
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Daily Assignment :

Start Kafka using docker-compose and:
1. Create a topic.
2. List Kafka topics.
3. Inspect one of them to see the number of partitions.

Answer:

docker-compose.yml

```yaml
version: '3'
services:
  zookeeper:
    image: confluentinc/cp-zookeeper:7.0.1
    container_name: zookeeper
    environment:
      ZOOKEEPER_CLIENT_PORT: 2181
      ZOOKEEPER_TICK_TIME: 2000

  broker:
    image: confluentinc/cp-kafka:7.0.1
    container_name: broker
    ports:
      - "9092:9092"
    depends_on:
      - zookeeper
    environment:
      KAFKA_BROKER_ID: 1
      KAFKA_ZOOKEEPER_CONNECT: 'zookeeper:2181'
      KAFKA_LISTENER_SECURITY_PROTOCOL_MAP: PLAINTEXT:PLAINTEXT,PLAINTEXT_INTERNAL:PLAINTEXT
      KAFKA_ADVERTISED_LISTENERS: PLAINTEXT://localhost:9092,PLAINTEXT_INTERNAL://broker:29092
      KAFKA_OFFSETS_TOPIC_REPLICATION_FACTOR: 1
      KAFKA_TRANSACTION_STATE_LOG_MIN_ISR: 1
      KAFKA_TRANSACTION_STATE_LOG_REPLICATION_FACTOR: 1
    restart: always
```

The docker-compose.yml file serves the purpose of defining and configuring a Kafka cluster using Docker Compose. It specifies two services, zookeeper and broker representing Zookeeper and kafka respectively.

Version: ‘3’ are specifies the version of the Docker Compose file format. Services: This is the start of the services section, where individual services are defined.

The ZooKeeper service,it uses the confluentinc/cp-zookeeper Docker image with version 7.0.1. The container_name sets the name of the container to "zookeeper". The environment section sets environment variables for ZooKeeper, including the client port and tick time.

The Kafka broker service, it uses the confluentinc/cp-kafka Docker image with version 7.0.1. The container_name sets the name of the container to "broker". The ports section maps the container’s port 9092 to the host’s port 9092, allowing external access to the Kafka broker. The depends_on field specifies that the Kafka broker service depends on the ZooKeeper service. The environment section sets various environment variables for the Kafka broker, including the broker ID, ZooKeeper connection details, listener security protocols, advertised listeners, replication factors for the offsets topic and transaction state log, etc. The restart: always ensures that the Kafka broker container is always restarted if it goes down. This docker-compose.yml file sets up a single-node Kafka cluster with ZooKeeper, using the specified versions of the Confluent Platform images. The broker is accessible on localhost at port 9092, and ZooKeeper is running on port 2181.

```
(base) qadeerhussain@all-MS-7D35:~/Qadeer/Training/module 4/4.2_Kafka/assignment/Assignment_playing_with_kafka$ docker-compose up -d
/snap/docker/2746/lib/python3.6/site-packages/paramiko/transport.py:32: CryptographyDeprecationWarning: Python 3.6 is no longer supporte
d by the Python core team. Therefore, support for it is deprecated in cryptography. The next release of cryptography (40.0) will be the
last to support Python 3.6.
  from cryptography.hazmat.backends import default_backend
Creating network "assignment_playing_with_kafka_default" with the default driver
Creating zookeeper ... done

Creating broker    ... done
```

docker-compose up -d : This command will start the zookeeper and kafka services in the background.

create_kafka_topic.sh

Open

create_kafka_topic.sh
~/Qadeer/Training/module 4/4.2_Kafka/assignment/Assignment_playing_with_kafka

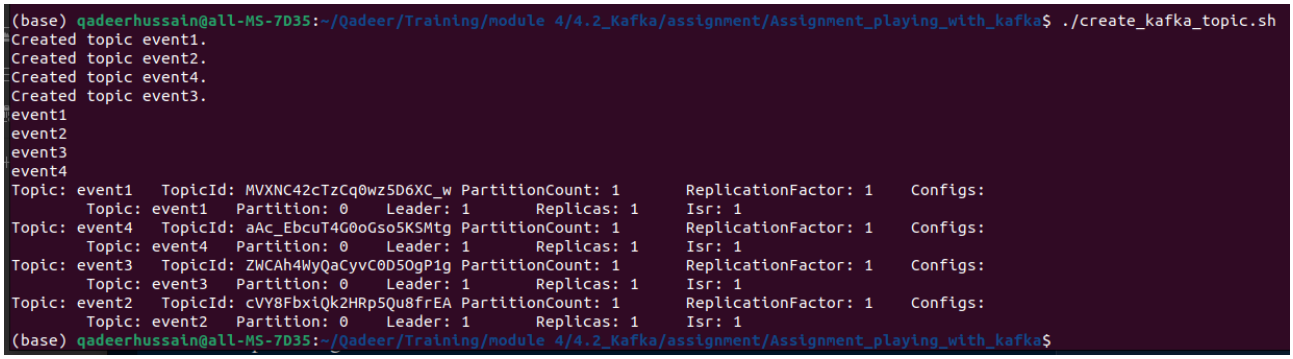
```
#!/bin/bash

docker compose exec broker kafka-topics --create --topic event1 --bootstrap-server broker:9092
docker compose exec broker kafka-topics --create --topic event2 --bootstrap-server broker:9092
docker compose exec broker kafka-topics --create --topic event4 --bootstrap-server broker:9092
docker compose exec broker kafka-topics --create --topic event3 --bootstrap-server broker:9092

docker compose exec broker kafka-topics --list --bootstrap-server broker:9092

docker compose exec broker kafka-topics --describe --bootstrap-server broker:9092

```

create_kafka_topic.sh: In this file we write the all commands like create the topics, list the topics and Describe the topics.

docker compose exec broker kafka-topics --create --topic event1 --bootstrap-server broker:9092 : This command we use for create the kafka topic.

docker compose exec broker kafka-topics --list --bootstrap-server broker:9092 : This command we use for listed the kafka topics.

docker compose exec broker kafka-topics --describe --bootstrap-server broker:9092 : This command describe the kafka topics.



./create_kafka_topic.sh : The ./ at the beginning of the command specifies the current directory, and create_kafka_topics.sh is the name of the shell script file that is being executed. The ./ is used to explicitly indicate that the script is located in the current directory. When we run this command, the shell script create_kafka_topics.sh executed, and its contents processed by the shell interpreter.