**DAY-5(Apache Kafka)**

1. Setting up a Kafka Producer:

a) Write a Python program to create a Kafka producer.

b) Configure the producer to connect to a Kafka cluster.

c) Implement logic to send messages to a Kafka topic.

2. Setting up a Kafka Consumer:

a) Write a Python program to create a Kafka consumer.

b) Configure the consumer to connect to a Kafka cluster.

c) Implement logic to consume messages from a Kafka topic.

3. Creating and Managing Kafka Topics:

a) Write a Python program to create a new Kafka topic.

b) Implement functionality to list existing topics.

c) Develop logic to delete an existing Kafka topic.

4. Producing and Consuming Messages:

a) Write a Python program to produce messages to a Kafka topic.

b) Implement logic to consume messages from the same Kafka topic.

c) Test the end-to-end flow of message production and consumption.

5. Working with Kafka Consumer Groups:

a) Write a Python program to create a Kafka consumer within a consumer group.

b) Implement logic to handle messages consumed by different consumers within the same group.

c) Observe the behavior of consumer group rebalancing when adding or removing consumers.

**Submission Guidelines:**

- Answer all the questions in a single Jupyter Notebook file (.ipynb).

- Include necessary code, comments, and explanations to support your answers and implementation.

- Ensure the notebook runs without errors and is well-organized.

- Create a GitHub repository to host your assignment files.

- Rename the Jupyter Notebook file using the format "date\_month\_topic.ipynb" (e.g., "12\_July\_Kafka.ipynb").

- Place the Jupyter Notebook file in the repository.

- Commit and push any additional files or resources required to run your code (if applicable) to the repository.

- Ensure the repository is publicly accessible.

- Submit the link to your GitHub repository as the assignment submission.

**Grading Criteria:**

1. Understanding and completeness of answers: 40%

2. Clarity and depth of explanations: 25%

3. Correct implementation and evaluation of optimizer techniques: 15%

4. Analysis and comparison of different optimizers: 10%

5. Proper code implementation and organization: 10%  
  
**Note:- Create your assignment in Jupyter notebook and upload it to GitHub & share that uploaded assignment file link through your dashboard. Make sure the repository is public.**