

## **AWS Assignment - 2 (Implementation)**

- **Objective:** Design and implement a real-time data processing pipeline in AWS to manage a simulated e-commerce platform's inventory data.
- **Problem Statement:**

Your e-commerce platform needs to track real-time inventory changes for its products. Every time a product is added, removed, or its quantity changes, an event is generated. Your task is to design a real-time processing system that will capture these events, process them, and update a real-time inventory system.
- **Requirements:**
  - **Data Source:** A mock script you'll design will simulate inventory events by generating and publishing them to an AWS Kinesis stream.
  - **Event Processing:** Use AWS EventBridge to capture events from the Kinesis stream and forward them for processing.
  - **Data Transformation and Storage:**
    - Process the real-time stream of data to calculate the latest inventory state for each product.
    - Store the processed data in DynamoDB, ensuring that inventory counts remain consistent and accurate.
    - **Inventory Events Include:**
      - Product added to inventory.
      - Product removed from inventory.

- Product quantity changes (increment or decrement).

- **Sample Event Data (Inventory Event):**

```
{  
  "event_type": "product_added",  
  "product": {  
    "product_id": "P98765",  
    "product_name": "Laptop",  
    "quantity": 10,  
    "timestamp": "2023-09-11T12:00:00Z"  
  }  
}
```

- **Steps:**

- Create a Kinesis stream to capture real-time inventory events.
- Design a mock script that simulates the inventory events and publishes them to the Kinesis stream in real-time.
- Set up AWS EventBridge to capture the events from the Kinesis stream.
- Process the real-time events, and according to the event type, update the product's state in DynamoDB.
- Ensure DynamoDB maintains the latest inventory state for all products and handles high-velocity updates reliably.

- **Deliverables:**

- **Code:**
  - Mock event generation script.

- Any required AWS Lambda functions or processing scripts.

- **Documentation:**

- A detailed flowchart of the data pipeline.
- Description of how events are processed and how DynamoDB maintains consistency.
- Challenges faced and the solutions implemented.

- **Output:**

- Demonstrate the real-time processing by showing the consistent state of inventory in
- DynamoDB after simulating a series of inventory events.