**Assignment 4: Dashboard creation using Dash, Plotly and Streamlit**

**Submission – 14th March 2025**

**Objective:**

The goal of this assignment is to **store, process, and visualize** three datasets (**Booking Data, Dining Info, and Reviews Data**) using **MongoDB, Pandas, Dash, and Plotly**.

**Tasks:**

**Step 1: Load and Store Data in MongoDB**

1. **Ensure MongoDB is running** on your system (or use **MongoDB Atlas** for cloud storage).
2. Read the three datasets:
   * **Booking Data**
   * **Dining Info Data**
   * **Reviews Data**
3. Push all datasets into **MongoDB**, ensuring each dataset is stored in a separate **collection**.
4. Verify data integrity by fetching a few records from MongoDB.

📌 *Use pymongo to insert and retrieve data from MongoDB.*

**Step 2: Read Data from MongoDB into Pandas**

1. Connect to MongoDB and fetch each dataset.
2. Convert the MongoDB data into **Pandas DataFrames**.
3. Perform necessary **data cleaning and transformation**:
   * Handle missing values.
   * Convert **date columns** to datetime format.
   * Ensure **numerical fields** are in correct data types.

📌 *Use pandas and pymongo for this step.*

**Step 3: Build Interactive Dashboards Using Dash & Plotly**

💡 **Use Dash to create an interactive web application.**

**Dashboard 1: Hotel Booking Insights : Example - Bookings Trend Over Time:** Line chart showing daily hotel bookings, **Preferred Cuisine Analysis, Average Length of Stay (Weekly, monthly)**

**Dashboard 2: Dining Insights: Examples include Average Dining Cost by Cuisine:** Pie chart showing cost distribution and **Customer Count Over Time.**

**Dashboard 3: Reviews Analysis : Sentiment Analysis:** Examples - Pie chart showing positive, neutral, and negative reviews, **Rating Distribution:** Histogram of review ratings, **Word Cloud of Customer Feedback:** (Optional NLP Visualization)

Step 3:

Integrate everything into Streamlit

Addition to Assignment 2:

Add a sentiment analyzer to the real time review ui page. Use a preptrained sentiment detector like TextBlob to get sentiment score. If the customer is currently staying in the hotel and gives a negative review, send room number, review, and sentiment score to the email of the manager.