**Project Report: Comprehensive Data Management System Framework**

**Introduction**

This project involved developing a framework for a data management system to support a 4-month training program in digital literacy, AI, and robotics for students in grades 6 to 12. The project utilized Python scripts for automated data ingestion, cleaning, and transformation. The processed data was then visualized in Power BI dashboards and deployed on Netlify for real-time insights and accessibility.

**Objectives**

1. Automate data ingestion from Excel files into a centralized SQL database.
2. Implement data cleaning and transformation routines for accurate reporting.
3. Develop interactive dashboards in Power BI for real-time monitoring and detailed analytics.
4. Deploy dashboards for remote access using Netlify.

**Key Features**

1. **Automated Data Cleaning and Transformation**:
   * Removed duplicates and standardized missing values (e.g., 'Unknown', 'Absent').
   * Converted data types (e.g., datetime formatting) and handled inconsistencies.
   * Created derived metrics and aggregated data for analytical insights.
2. **Event-Driven Data Ingestion**:
   * Used Python and the Watchdog library to monitor Excel file changes.
   * Automated updates for student performance, attendance, and training material data.
3. **Real-Time Dashboarding**:
   * Developed Power BI dashboards to track attendance, teaching effectiveness, and student performance metrics.
   * Enabled dynamic filtering and slicing for detailed analytics.
4. **Deployment**:
   * Hosted dashboards on Netlify to provide accessible and user-friendly data insights.

**Skills and Tools**

* **Programming**: Python (data pipelines, Watchdog library).
* **Data Analysis**: Pandas, SQL (data modeling and integration).
* **Visualization**: Power BI (interactive dashboards, real-time monitoring).
* **Deployment**: Netlify for hosting dashboards.
* **Error Handling**: Ensured data integrity and robust error management in scripts.

**Challenges and Solutions**

* **Data Validation**: Handled issues with invalid ratings and missing records by incorporating comprehensive cleaning routines.
* **Automation**: Overcame initial inefficiencies by optimizing file monitoring and event-driven updates.
* **Learning Curve**: Explored and implemented new libraries and tools for effective workflow automation.

**Outcomes**

* Created a scalable framework for data-driven decision-making.
* Delivered a functional prototype showcasing automation, visualization, and deployment capabilities.
* Gained hands-on experience in integrating multiple tools to build cohesive data management systems.

PROJECT LINK - <https://github.com/NiGHTskY00/TASK_PROJECT>

DASHBOARD LINK - https://cool-mousse-bf94f2.netlify.app/