

Format for the Weekly Progress Report

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| Name of the Student 1 | Dev Pandya |
| Roll Number of Student 1 | 22BCP409 |
| Name of the Student 2 (if any) | Kavya Patel |
| Roll Number of Student 2 (if any) | 22BCP406 |
| Project Title | Smart Energy Consumption Monitoring and Prediction Using Big Data |
| Name of the Supervisor (Mentor) at PDEU | Dr. Samir Patel |
| Week Number | Week 7 |

Progress made in Week 7:

Scalable DB Schema: Designed an efficient relational database (DB) with composite keys (State Code + Timestamp) to handle high-frequency time-series data for all Indian states.

Gross Load Focus: Schema prioritizes features for **pure consumption (Gross Load)** forecasting, including lagged load and critical weather drivers (like temperature change), ensuring high model accuracy.

Kafka Streaming Pipeline: Established a **Kafka channel** for high-velocity data movement, ensuring a **decoupled, real-time data delivery** stream from the producer to the consumer application.

Consumer-Driven Persistence: A dedicated Consumer application performs **Upsert operations** to efficiently store the structured data records back into the relational database, maintaining a persistent, near real-time historical store.

All-India Scale: The architecture successfully supports **multi-dimensional scale-up** to independently manage and process load data for every distinct State/UT in India.

Dev Pandya

Kavya Patel

Dr. Samir Patel

**Name & Signature of
Student 1**

**Name & Signature of
Student 2**

**Name & Signature of
Supervisor (Mentor)**