Project Overview: Sentiment Analysis

- **Title: Sentiment Analysis**
- **Subtitle: Decoding Emotions: Sentiment Analysis of Text Data Using NLP and Machine Learning**
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- **Date: 15-8-2025**

Objective

I develop a sentiment analysis model capable of classifying text data (e.g., User_reviews) into categories such as **positive**, **negative**, or **neutral**. The goal was to extract emotional tone and insights from user experience improvements.

Key Components

- **Data Collection**
  I used a dataset of labeled text entries from public sources User_review containing examples of various sentiments.
- **Text Preprocessing**
  - Tokenization
  - Stopword removal
  - Lemmatization/Stemming
  - Vectorization using TF-IDF or word embeddings (e.g., Word2Vec or BERT)
- **Model Selection**
  we experimented with several algorithms:
  - Decision Tree Classifier
  - Logistic Regression
  - Tfidf Vectorizer (Text)
  - Label Encoder

- **Training & Evaluation**
    - Split data into training and test sets
    - Used metrics like accuracy, precision, recall, and F1-score
    - Applied cross-validation to ensure robustness

Output & Insights

- Each input text was classified into one of the sentiment categories.
- We visualized sentiment distribution using bar charts or pie charts.
- Highlighted keywords or phrases that influenced sentiment classification.
- Provided actionable insights based on sentiment trends like User feedback patterns.