Assignment (Applied Machine Learning)

Topic: Sentiment Analysis of Tweets Using Machine Learning

Group Members

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Identifying the Application Area

Natural Language Processing (NLP)

We chose the area of **Natural Language Processing (NLP)**, specifically applying it to the **analysis of tweets**. Tweets are short social media posts that often contain opinions, complaints, or praise. Machine learning can help **automatically determine the sentiment** behind a tweet — whether it is **positive** or **negative**.

Real-World Applications

This technique is commonly used by businesses, airlines, politicians, and media to monitor **public opinion in real-time**.

Project Objective and Goals

The goal of our project is to develop a machine learning model that can do;



Classification

Classify a tweet as **positive** or **negative**



Understanding

Help understand how people feel about a service, brand, or topic



Improvement

Eventually, this can help organizations improve their services by responding to negative feedback or understanding public praise

Machine Learning Approach

Learning Type

- We are using **Supervised Learning**, which means the model is trained on tweets that already have **known sentiment labels** (positive or negative).
- The type of task is **Binary Classification**.

Selected Models

We selected **Naive Bayes** and **Logistic Regression** because they are simple, effective, and easy to understand — especially for text classification tasks like this one.

Both models work well with small text datasets and give **fast and accurate predictions**.

Dataset Overview

We are using the **Twitter US Airline Sentiment Dataset** available on Kaggle.

📦 Dataset Summary:

Contains over **14,000 tweets**

Each tweet is labeled as **positive**, **negative**, or **neutral**

For our initial model, we will focus on **binary classification** (positive vs. negative)

Each record includes:

- The tweet text
- The sentiment label
- Airline name
- Time and location of the tweet

Example:

Tweet: "Southwest Airlines has the best customer service!" Sentiment: positive

Tweet: "I will never fly with United again. Worst experience." Sentiment: negative