

# Employee Sentiment Analysis – Final Report

## 1. Introduction

This report presents the results of employee sentiment analysis based on the company's internal communication dataset (test.xlsx). The analysis extracts sentiment scores, monthly trends, top positive/negative employees, and flight-risk predictions.

## 2. Data Overview

The dataset contains employee messages with timestamps. The data was loaded from an Excel file, cleaned, processed, and prepared for sentiment scoring.

## 3. Sentiment Labeling

Each employee message was analyzed using a sentiment model to classify it as Positive, Negative, or Neutral. Additional numeric sentiment scores were generated for further calculations.

## 4. Monthly Score Analysis

Monthly sentiment averages were computed to understand workforce morale trends. Visualizations such as sentiment distribution and monthly heatmaps were generated.

## 5. Top Employees by Month

Employees with the highest and lowest sentiment scores per month were identified. These insights help track performance, morale, and communication tone across time.

## 6. Flight Risk Detection

Flight-risk insights were derived using negative sentiment patterns, message frequency, and downward trends. A risk dataset was created to highlight employees needing attention.

## 7. Models Used

A simple regression model (Linear Regression) was trained to capture relationships between message sentiment and risk patterns. The trained model was saved as joblib.

## 8. Outputs Generated

- monthly\_scores.xlsx
- top\_employees\_by\_month.xlsx
- flight\_risks.xlsx
- Visualizations (PNG graphs)
- Labeled messages dataset

## **9. Conclusion**

The analysis provides actionable insights into employee sentiment, productivity trends, and retention risks. These insights can support HR decision-making and organizational planning.