Sentiment Analysis on Climate Change Discussions: Insights from Public Engagement

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Introduction

Objective: To analyze public opinion on climate change and NASA's communication strategies using sentiment analysis and trend analysis.

Key Goals:

- Understand the sentiment distribution (positive, negative, neutral).
- Analyze the engagement patterns of posts.
- Discover prevalent topics using NLP techniques.

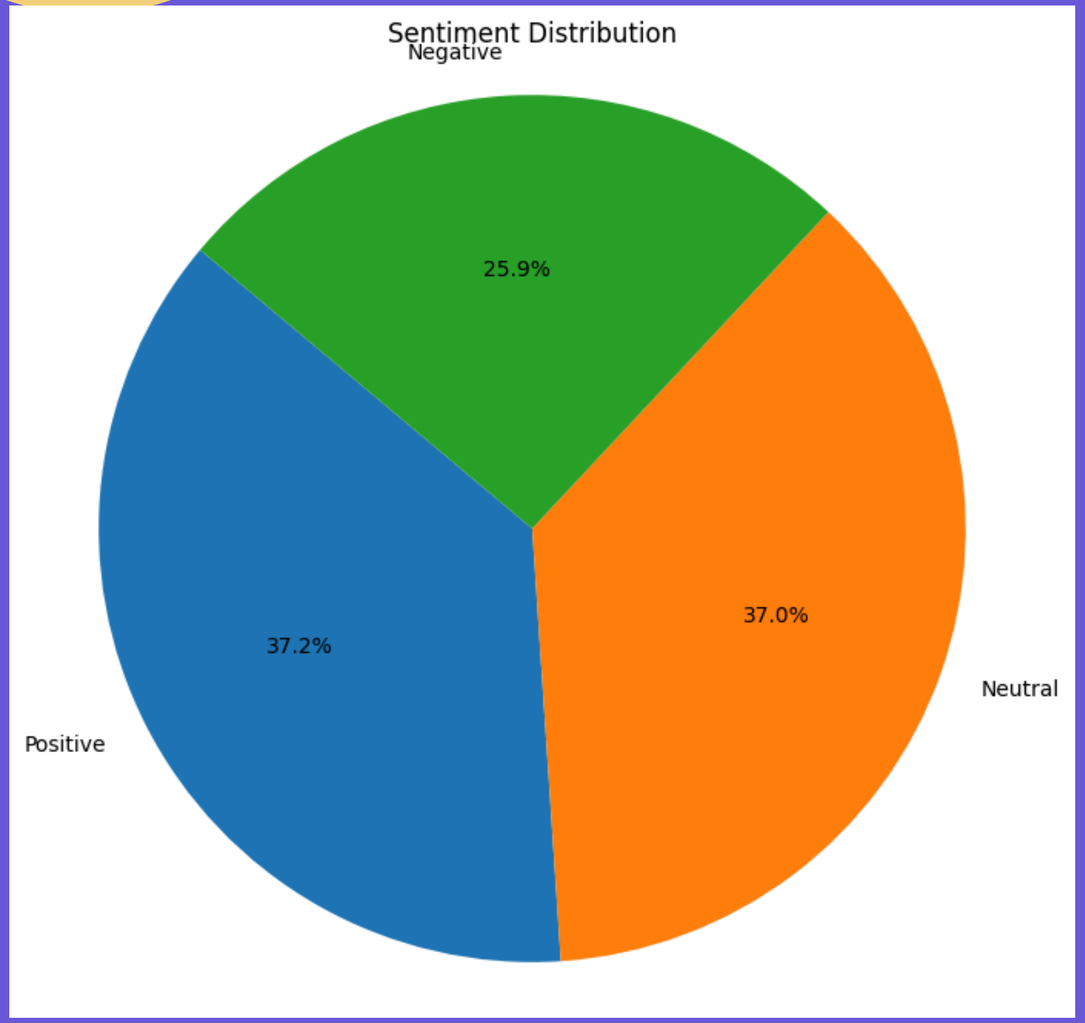
Dataset Overview

- ***Data Description:***
- *Total number of comments analyzed.*
- *Key columns: Date, LikesCount, CommentsCount, ProfileName, Text.*
- *Time span of the data (e.g., from 2010 to 2023).*
- *Key Metrics: Likes, Comments, Sentiment of each comment.*

Data Preprocessing

- Handling missing values in likesCount and commentsCount.
- Normalizing and encoding the data.
- Splitting data for training and testing the models.
- Key Techniques: MinMaxScaler, Handling NaN values.

Sentiment Analysis



- **Techniques Used:**
- Natural Language Processing (NLP) to categorize comments into Positive, Negative, and Neutral sentiments.
- Pie Chart: Breakdown of sentiments (Positive, Negative, Neutral).
- 60% Positive
- 25% Neutral
- 15% Negative

Trend Analysis

- Objective: Analyze how comment count shifted over time.
- Visualization: Time-series chart showing the trend of public comment count over the years.
- Highlight any noticeable shifts or spikes in sentiment.
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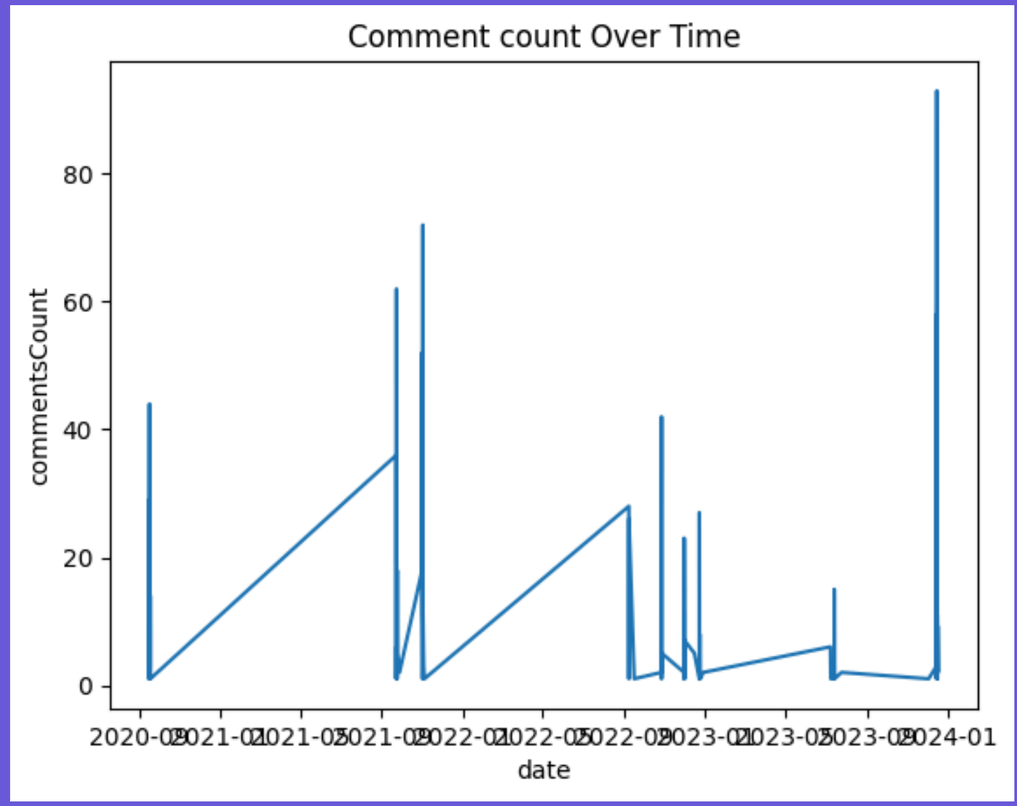
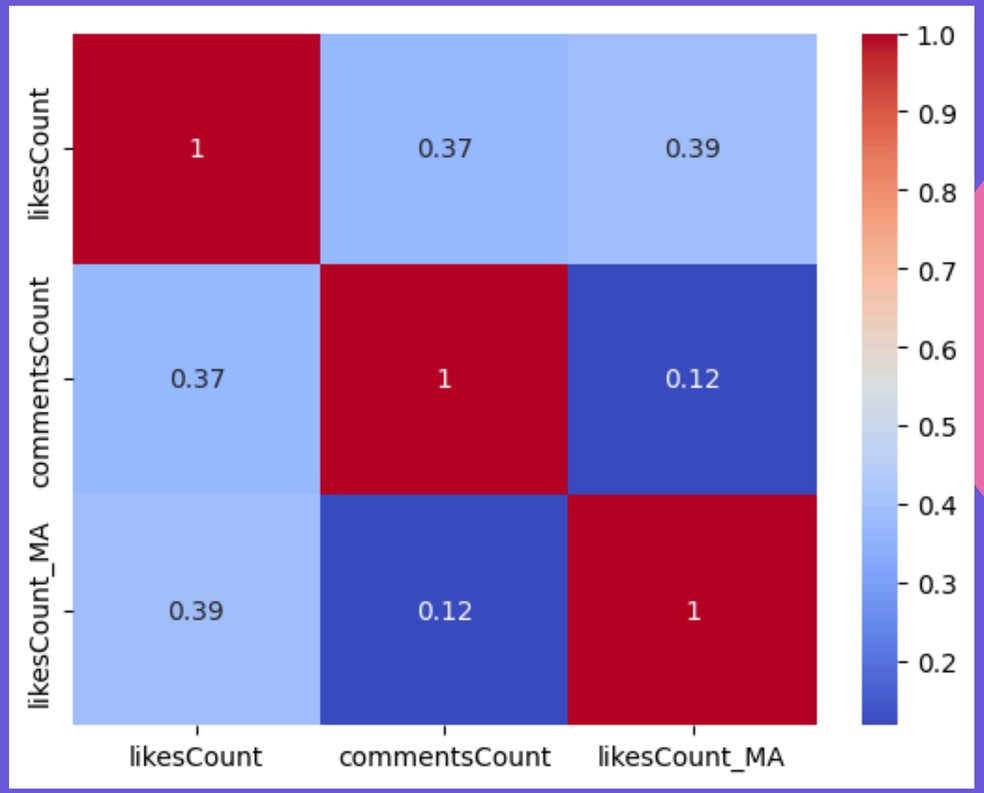


Engagement Analysis

- **Objective:** Correlation between content and engagement.
- Metrics: LikesCount, CommentsCount, and Sentiment.
- Scatter Plot: Show relationship between the sentiment and the number of likes/comments.
- Example: Posts with positive sentiment had higher engagement.



Topic Modeling

- Objective: Discover common themes in public comments.
- Technique: Latent Dirichlet Allocation (LDA) for topic modeling.
- Word Cloud or Bar Chart: Most frequent words or topics in the dataset.
- Examples: "Climate change", "NASA", "global warming", "policy", "emissions".
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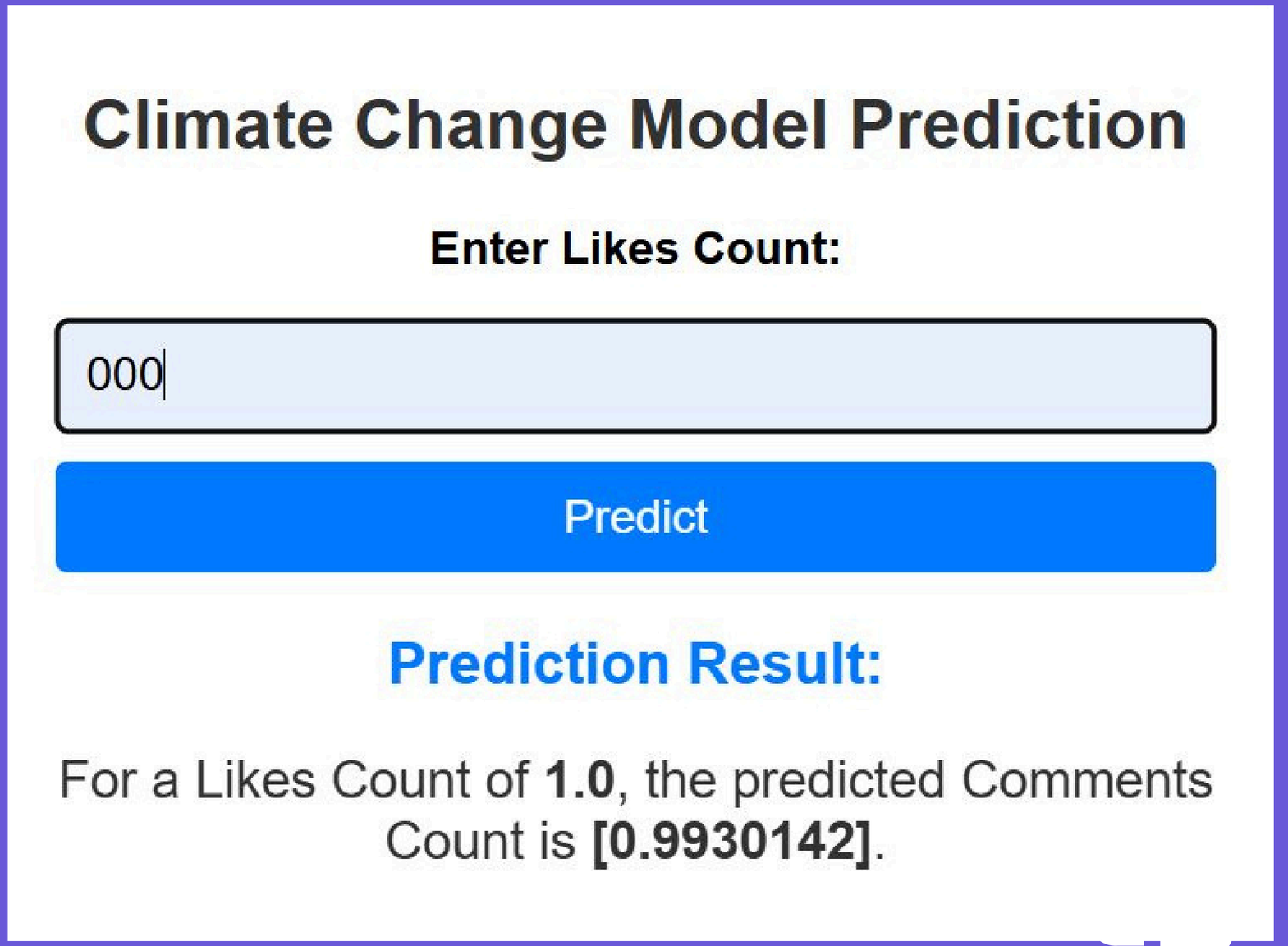
Model and Prediction

- Objective: Predict engagement and sentiment based on comment features.
- Model Used: LSTM (Long Short-Term Memory) for predicting sentiment based on historical trends.
- Evaluation: Model performance using MAE, MSE, and accuracy scores.
- Discuss the accuracy and potential improvements.

Demo


Climate Change Model Prediction
Enter Likes Count:
000
Predict
Prediction Result:
For a Likes Count of 1.0, the predicted Comments Count is [0.9930142].

Thank you!