SENTIMENT ANALYSIS IN SOCIAL MEDIA- SocialSphere

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Predicting Sentiment Of A Text

01 - ABSTRACT

Social media platform enriched with cutting-edge machine learning capabilities for sentiment analysis. SocialSphere offers users standard social networking functionalities including user registration, login and posting. Moreover, an advanced ML model is seamlessly integrated into the platform's backend to categorize tweets into four distinct sentiment classes: positive, negative, irrelevant, and neutral. Users receive instantaneous feedback on the sentiment of their posts, empowering them to gauge their online impact. Additionally, the platform implements a proactive user behavior monitoring system, identifying accounts with a high frequency of negative posts for further scrutiny. Users surpassing a predefined threshold of negative posts face escalating consequences, ranging from warnings to account termination. Through this project, we strive to cultivate a supportive and constructive online community while showcasing the transformative potential of ML in enhancing user engagement and platform moderation on SocialSphere.

02 - Existing System

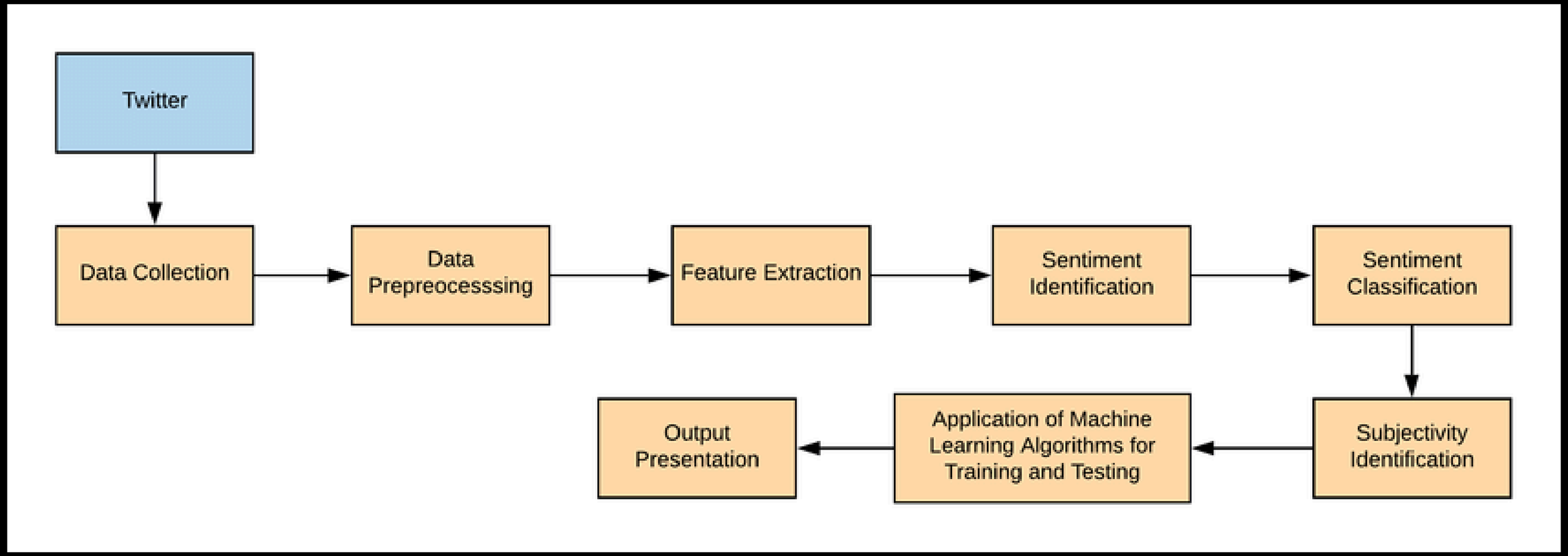
The existing system for this project typically comprises traditional social media platforms available in the market, which offer basic functionalities such as user registration, login, post creation, and interaction with other users' posts. These platforms often lack robust sentiment analysis capabilities and proactive user behavior monitoring systems. Users on these platforms do not receive real-time feedback on the sentiment of their posts, and there is limited oversight for identifying and managing accounts with frequent negative posts. Furthermore, content moderation on existing social media platforms tends to rely heavily on reactive approaches, where content is flagged and reviewed after it has been reported by users or detected by automated systems. This reactive moderation process can be time-consuming and may result in harmful content spreading rapidly before it is addressed. Additionally, existing platforms often lack advanced machine learning capabilities for analyzing sentiment and predicting user behavior, which limits their ability to foster a positive and supportive online community effectively.

03 - Proposed System

The SocialSphere system is a new social media platform that incorporates advanced machine learning capabilities for sentiment analysis. It includes standard social networking features like user registration, login, tweet searching, and posting. The key innovation is integrating an advanced ML model into the platform's backend to classify tweets into four sentiment categories: positive, negative, irrelevant, and neutral. This setup allows users to promptly assess the sentiment of their posts, helping them understand their online influence in real-time.

SocialSphere aims to foster a positive online environment and highlight the transformative power of machine learning in improving user engagement and platform management. By offering users instant sentiment feedback and proactively addressing negative behaviors, the system strives to set a new benchmark for social media platforms, prioritizing user well-being and community welfare.

04 -System Architecture



05 - List of Modules

1. **USER REGISTRATION MODULE**
2. **USER LOGIN MODULE**
3. **USER SESSION MANAGEMENT MODULE**
4. **SENTIMENT ANALYSIS MODULE**
5. **PROACTIVE USER BEHAVIOUR MONITORING MODULE**
6. **TWEET DISPLAY**

06 -Functional Description for each modules

User Registration Module

The User Registration Module allows new users to create an account on the SocialSphere platform. It consists of the **register_page** function, which renders a registration form for collecting user details such as email, password, and age. It validates the password confirmation to ensure that the passwords match before storing the registered user details in the session state. Upon successful registration, users receive a confirmation message, while mismatched passwords prompt an error message.

06 -Functional Description for each modules

User Login Module

The User Login Module is responsible for authenticating existing users to grant access to their accounts. It includes the **login_page** function, which provides a login form to collect the user's email and password. The credentials are verified against the registered users stored in the session state. Successful authentication updates session state variables to reflect the user's logged-in status and displays a success message, while incorrect credentials trigger an error message.

06 -Functional Description for each modules

User Session Management Module

The User Session Management Module manages the user authentication status and session information. It initializes session state variables such as **logged_in**, **age**, **positive_tweet_count**, **tweets**, and **registered_users**. The **logout()** function is included to reset these session state variables, effectively logging the user out and clearing their session data. Upon logout, a success message is displayed to confirm that the user has been logged out.

06 -Functional Description for each modules

Sentiment Analysis Module

The Sentiment Analysis Module provides functionality for analyzing the sentiment of user-submitted tweets and giving feedback. It includes the **sentiment_analysis** function, which renders a form for tweet submission, processes the tweet using a pre-loaded machine learning model, and categorizes the sentiment as positive, negative, irrelevant, or neutral. Based on the analysis, the system updates the user's tweet history, increments the positive tweet count if applicable, and provides immediate feedback on whether the tweet can be posted.

06 -Functional Description for each modules

Proactive User Behaviour Monitoring Module

This module monitors user behavior, particularly focusing on users under 18, and manages positive tweet counts. Within the **sentiment_analysis** function, it checks the user's age and prevents underage users from posting negative tweets by issuing a warning. It also tracks the number of positive tweets posted by each user, awarding a "Positive Badge" if the count exceeds five. This proactive monitoring helps foster a positive online environment by encouraging constructive behavior.

06 -Functional Description for each modules

Tweet Display Module:

The Tweet Display Module is responsible for displaying the history of tweets posted by the user, along with timestamps. It includes the **display_tweets()** function, which iterates through the user's tweet history stored in the session state and renders each tweet with its corresponding timestamp. This allows users to review their previous posts and the sentiment feedback provided, enhancing transparency and engagement on the platform.

ALGORITHM

Random Forest is an ensemble learning algorithm used for classification tasks. It combines multiple decision trees trained on random subsets of the data and features. By employing bootstrap aggregating and feature randomness, it reduces overfitting and improves generalization. Each decision tree in the Random Forest independently predicts the class, and the final prediction is determined by a voting mechanism. In our sentiment analysis project for SocialSphere, Random Forest can accurately categorize tweets into sentiment classes, enhancing user engagement and community moderation.

07-OUTPUTS

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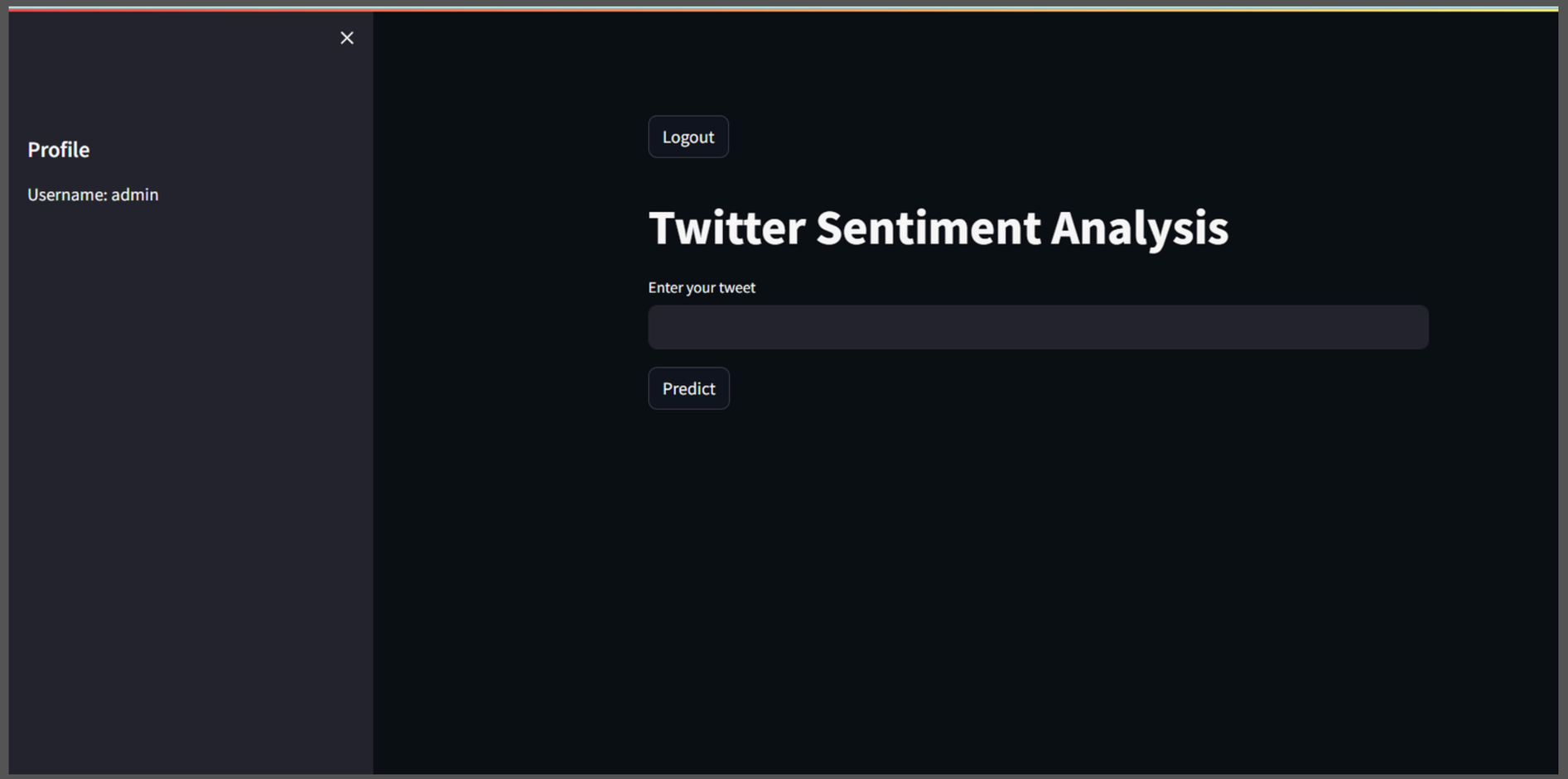
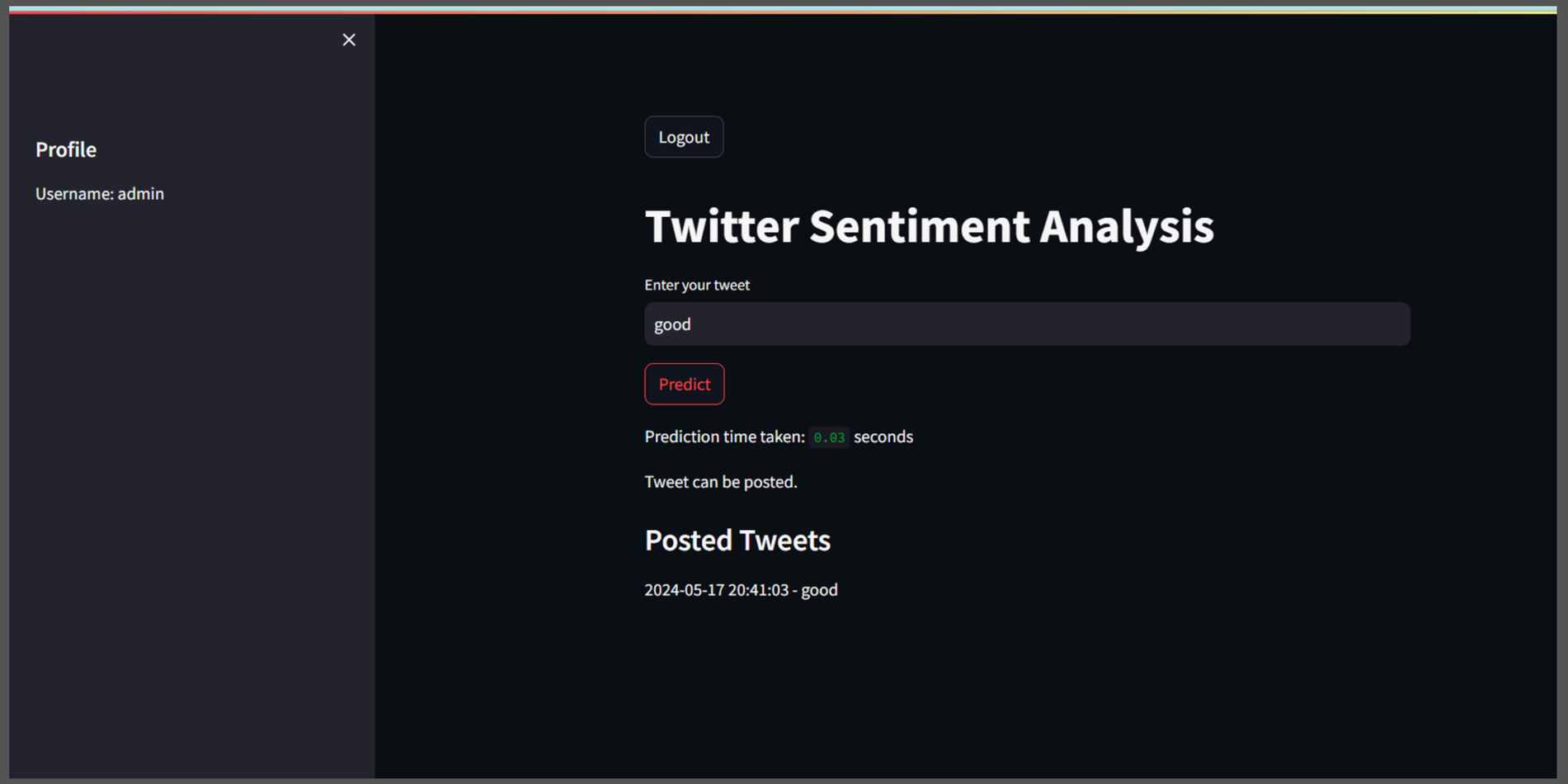
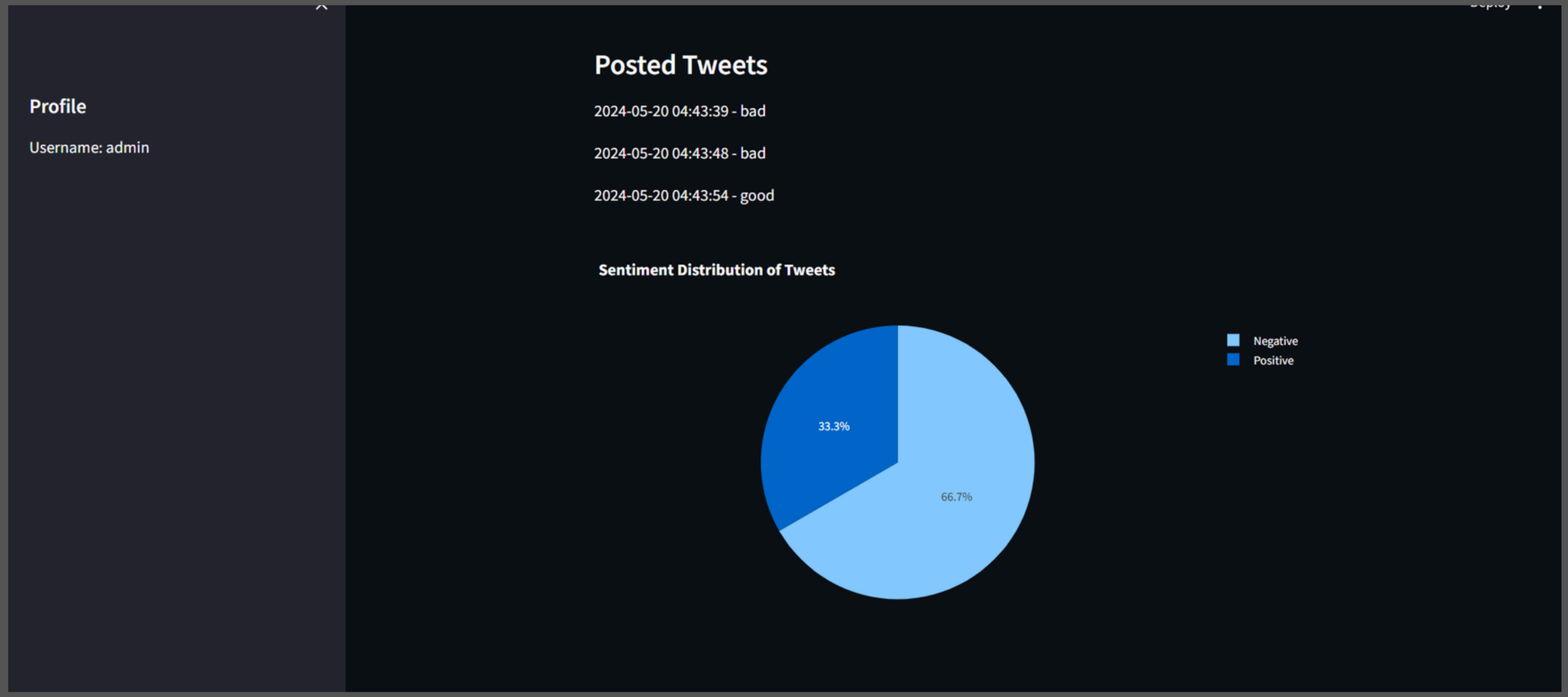

Profile
Username: admin
Logout
Twitter Sentiment Analysis
Enter your tweet
Predict

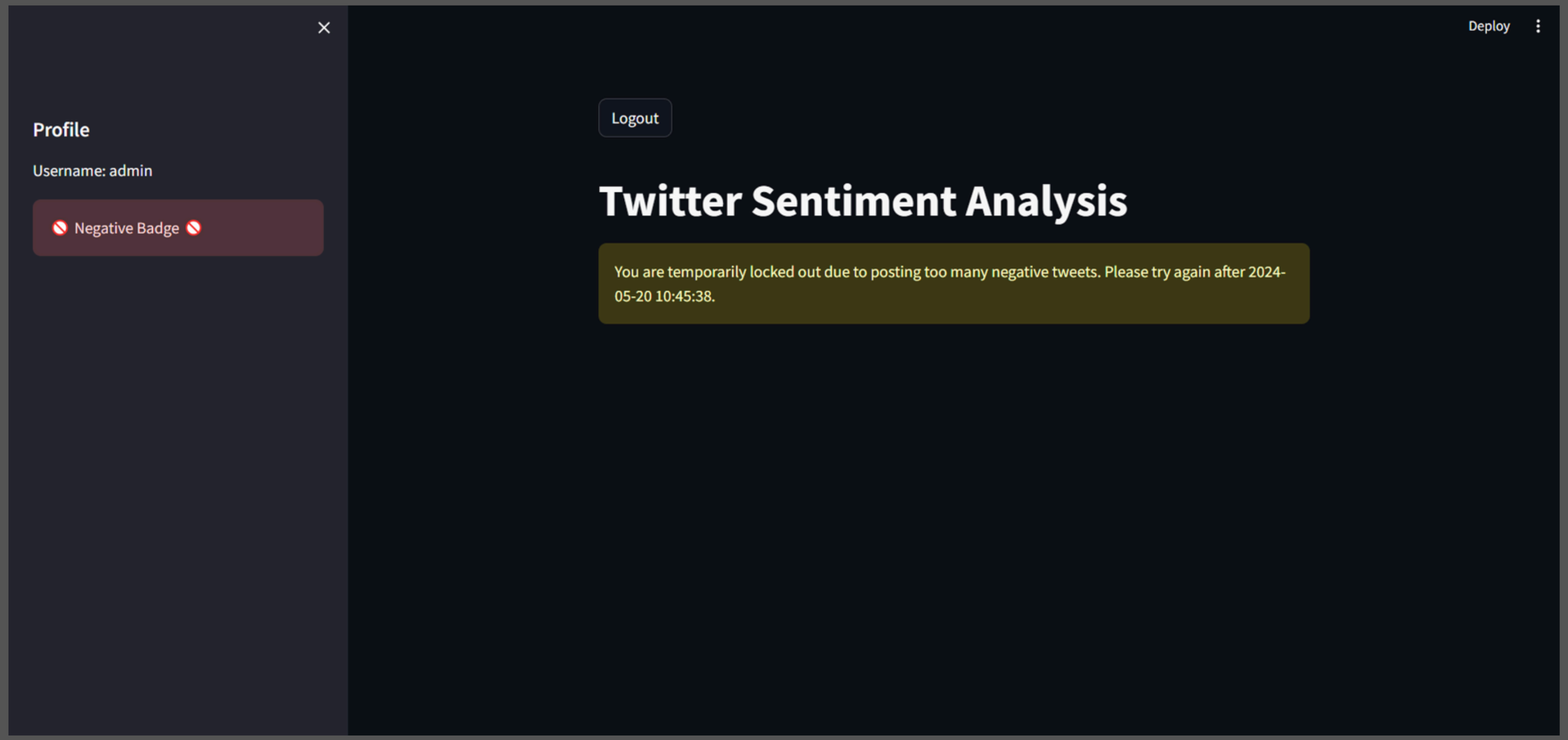
07-outputs


Profile
Username: admin
Logout
Twitter Sentiment Analysis
Enter your tweet
good
Predict
Prediction time taken: 0.03 seconds
Tweet can be posted.
Posted Tweets
2024-05-17 20:41:03 - good

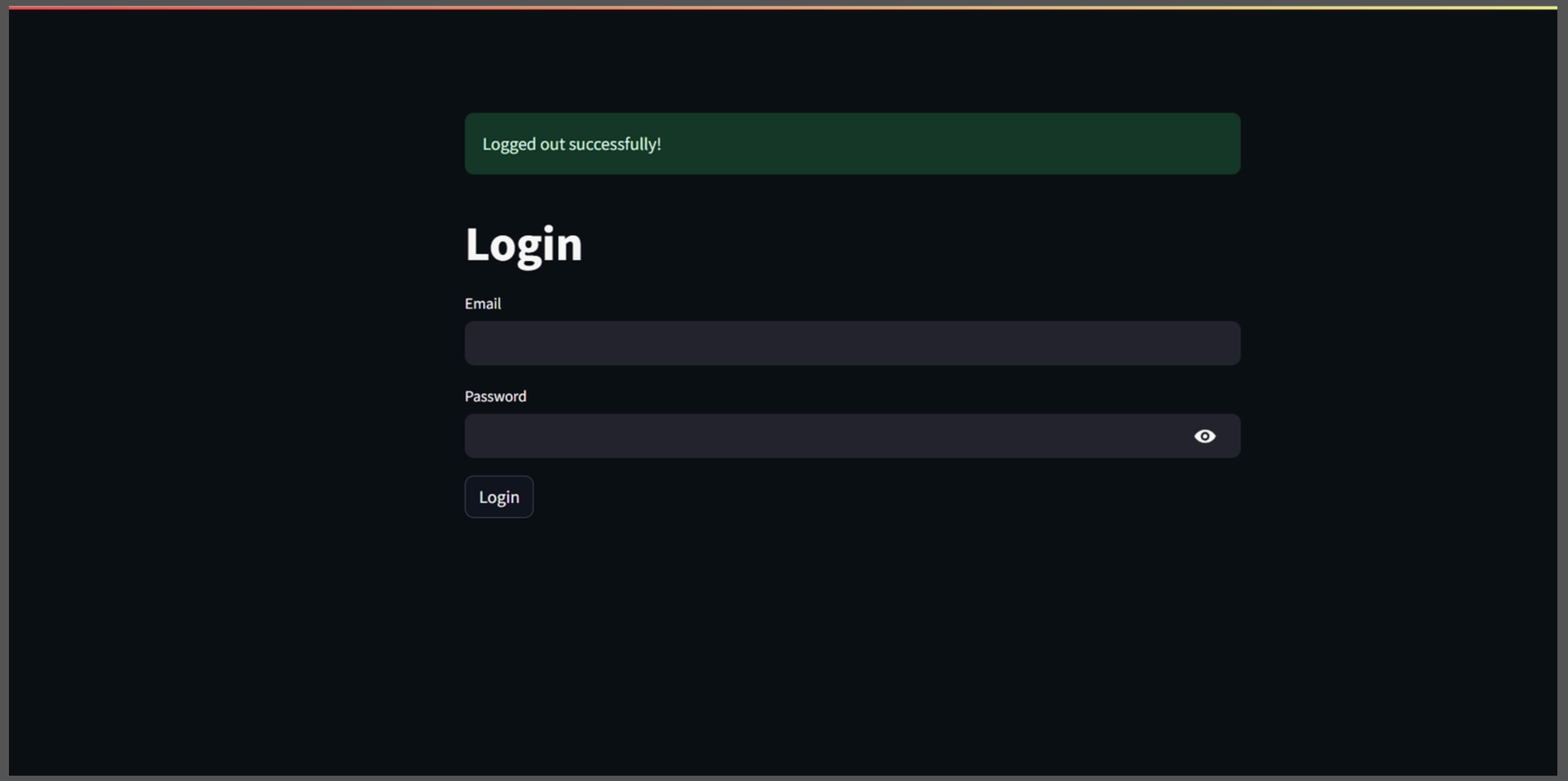
07-outputs


Profile
Username: admin
Posted Tweets
2024-05-20 04:43:39 - bad
2024-05-20 04:43:48 - bad
2024-05-20 04:43:54 - good
Sentiment Distribution of Tweets
Negative
Positive
33.3%
66.7%

07-outputs


Deploy
Logout
Profile
Username: admin
Negative Badge
Twitter Sentiment Analysis
You are temporarily locked out due to posting too many negative tweets. Please try again after 2024-05-20 10:45:38.

07-outputs



08-Conclusion

In conclusion, the SocialSphere project successfully demonstrates the integration of advanced machine learning techniques for real-time sentiment analysis and proactive user behavior monitoring on a social media platform. By accurately categorizing user posts into distinct sentiment classes and providing immediate feedback, SocialSphere enhances user awareness and promotes positive interactions. The proactive monitoring system effectively identifies and manages accounts with frequent negative posts, contributing to a healthier online environment.

The project's scalability and performance highlight its potential for widespread adoption, showcasing how technology can significantly improve user engagement and community moderation. Overall, SocialSphere represents a significant step forward in leveraging machine learning to foster supportive and constructive social media experiences.

09-References

References

1. Sentiment analysis algorithms and applications A survey Medhat, W Hassan, A Korashy H 2014
2. Like it or not A Survey of Twitter Sentiment Analysis Methods Giachanou A Crestani F 2016
3. Sentiment Analysis and Opinion Mining Liu, B 2012
4. MonkeyLearn - Sentiment Analysis Online
5. ClientZen - Sentiment Analysis Tool
6. X.com - Flow Login
7. DeepLearning.ai - Natural Language Processing
8. BuiltIn - Random Forest Algorithm

Thank you