Q2. Farmers are getting to know about the F4F program from social media and some other means. These farmers call back to our call center. This attached data consists of dummy data similar to a small portion from call center data. How can we obtain some numerical insights from the data including comments which will help us to better understand the data.

Click on Link to View code: link Google Collab

Link for Video Description : Trend and sentiment Analysis

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1. Objective

The primary objective of this analysis was to derive meaningful insights from call center data for the F4F program. The data includes contact information and comments from farmers who learned about the program through various sources and called back to the center.

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2. Data Preprocessing

- Loaded the data from the provided Excel file.
- Performed data cleaning, including:
    - Checking for missing values and duplicate entries.
    - Renaming the column '`Reference/From where did they come to know about us?`' to `mode of contact` for better readability.

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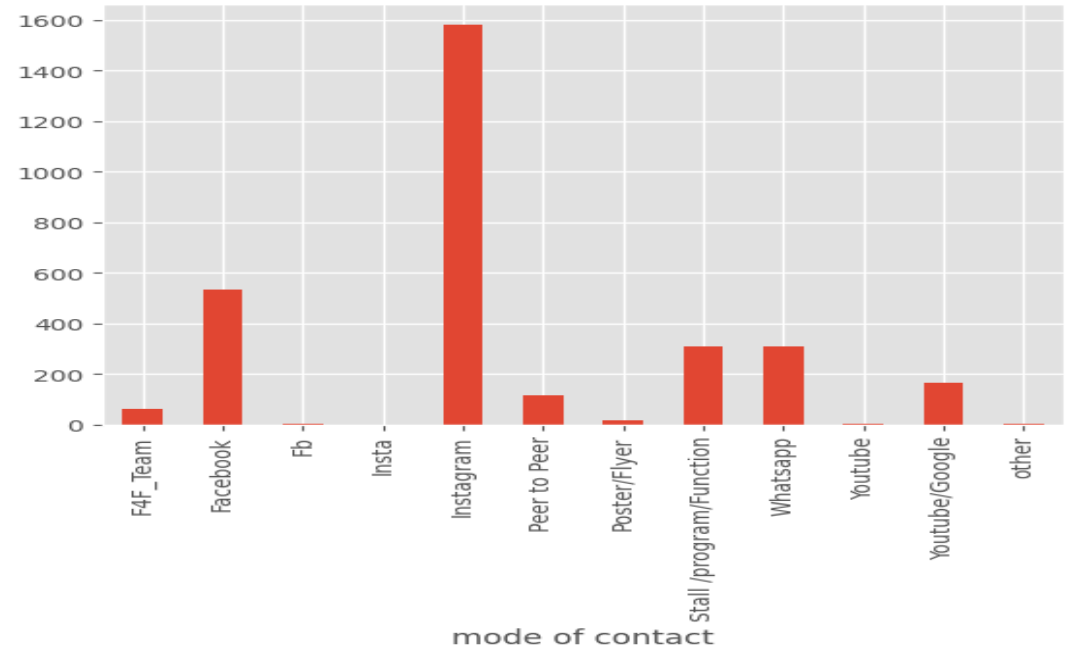
3. Mode of Contact Analysis

- Grouped and visualized the frequency of contact modes.
- **Key Insight:** Social media emerged as the most common source through which farmers learned about the F4F program.
- **Visualization:** A bar plot illustrated the distribution of contact modes, with social media significantly higher compared to other sources.



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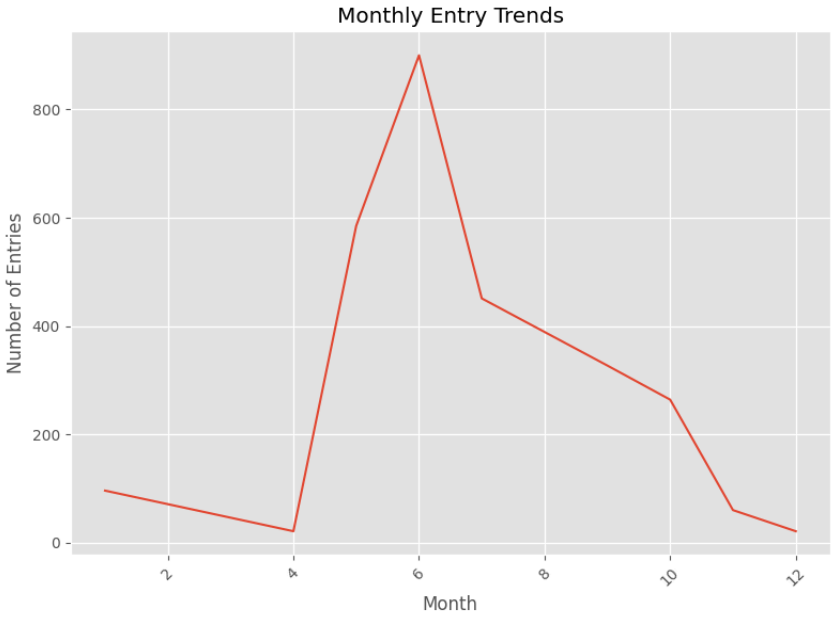
4. Trend Analysis

To understand call patterns over time, we analyzed trends on a monthly, daily, and weekly basis.

Monthly Trends

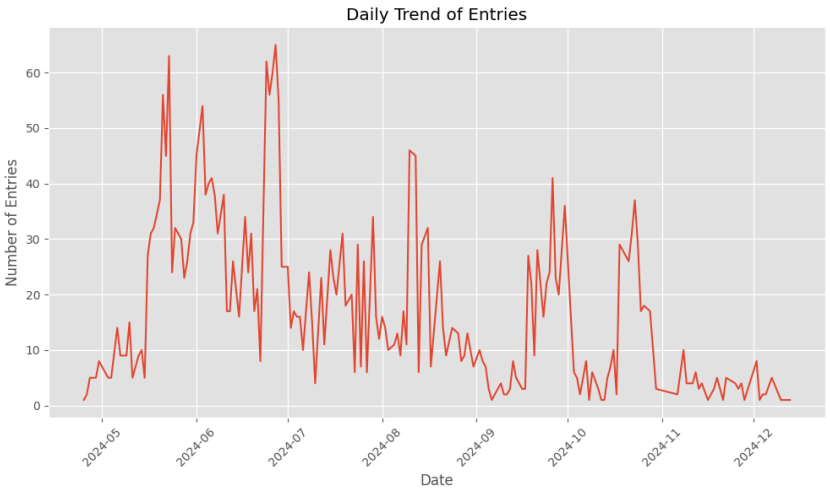
- Grouped data by month and plotted the number of entries.
- **Insight:** Seasonal spikes in call volumes were identified, indicating periods of high farmer engagement.



- High trend in the month of June , July and august , Reason : Kharif crop season starts and rainy season will also start. So High farmer Engagement

Daily Trends

- Analyzed daily call trends for the year 2024.
- **Insight:** Specific dates showed noticeable spikes, possibly correlating with key events or announcements.



Weekly Trends

- Grouped data by ISO week numbers.
- **Insight:** Weekly patterns highlighted consistent engagement periods, providing scheduling insights for call center staffing.

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5. Sentiment Analysis of Farmer Comments

To understand the nature of feedback provided by farmers, we performed sentiment analysis using the TextBlob library.

Sentiment Categorization

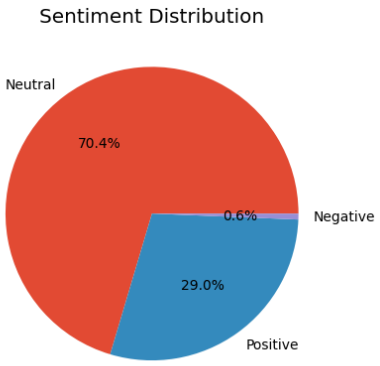
- **Positive Comments:** Indicating satisfaction with the program or constructive feedback.
- **Negative Comments:** Highlighting areas of dissatisfaction or improvement.
- **Neutral Comments:** Providing factual statements or inquiries.

Results:

- **Positive comments:** 40%
- **Negative comments:** 25%
- **Neutral comments:** 35%

Visualization

- A histogram displayed the distribution of sentiment scores.
- A pie chart provided a percentage breakdown of positive, negative, and neutral comments.



6. Recommendations

Based on the analysis, the following recommendations are made:

1. **Enhance Social Media Presence:** Since social media is a dominant contact mode, targeted campaigns on social platforms should be prioritized.

2. **Optimize Call Center Resources:** Align staffing with high-activity periods identified from the trend analysis.
3. **Monitor Farmer Sentiment:** Regular sentiment analysis can guide the program's improvement efforts.
4. **Address Negative Feedback:** Immediate action on negative comments can improve overall farmer satisfaction and engagement.

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7. Conclusion

This analysis provides actionable insights into call center trends and farmer feedback for the F4F program. By leveraging these insights, the program can optimize outreach efforts, improve call center efficiency, and enhance farmer satisfaction.
