**Customer Sentiment Analysis**

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**Overview :**

This project focuses on analyzing the top 336 reviews of the iPhone 15, one of the best-selling models, by scraping data directly from the Flipkart website. The data collection process was conducted using Selenium and BeautifulSoup, enabling us to extract key information such as customer names, cities, review dates, and the review text. We installed and used the required libraries, including nltk, Selenium, TextBlob, and BeautifulSoup, to facilitate various stages of the analysis. The extracted data was then organized into a structured DataFrame using pandas. As part of the data cleaning process, reviews were standardized to lowercase, and missing values (NaN) in the reviews column were replaced with blank entries. This prepared the data for further analysis.

**Sentiment Analysis :**

To understand customer sentiment, we employed nltk and TextBlob for sentence tokenization, breaking each review into individual sentences for detailed sentiment evaluation. Using the statistics module, we calculated the polarity of each tokenized sentence to gauge the sentiment strength, with polarity scores ranging from -1 (negative) to +1 (positive). We added an average\_polarity column to capture the mean polarity for each review. Finally, we calculated the overall mean polarity across all reviews, which was determined to be **0.4949844104308391**, indicating a slightly positive sentiment among reviewers.

**Polarity Calculation:**

* Calculated sentiment polarity for each sentence.
* Polarity range: -1 (negative) to +1 (positive).
* Created an average\_polarity column for each review.

**Insights :**

The analysis revealed that the overall sentiment for the iPhone 15 is predominantly positive, with many customers expressing satisfaction with the product. The mean polarity score close to 0.5 suggests that while the reviews lean toward positive sentiment, there is room for improvement to further enhance customer experiences. Certain reviews with neutral or slightly negative sentiments might indicate areas where the product or its features could be improved.

**Recommendations :**

1. **Enhance Product Features:** Identify and address specific concerns raised in reviews with lower sentiment polarity to enhance customer satisfaction.
2. **Focus on Positive Aspects:** Highlight the features and qualities that received highly positive sentiment in marketing and promotional activities.
3. **Customer Engagement:** Encourage satisfied customers to leave detailed reviews to further reinforce the product’s positive perception.
4. **Monitor Feedback:** Regularly analyze customer sentiment to stay informed about changing preferences and address potential concerns proactively.

By leveraging tools like nltk, Selenium, TextBlob, and BeautifulSoup, this analysis provides valuable insights into customer sentiment, helping stakeholders align strategies to maintain and enhance the iPhone 15's reputation as a best-selling product.