Amazon Review Sentiment Analysis

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Goal Statement:

The goal of this project is to determine whether sentiment from Amazon customer review text can accurately predict customer satisfaction rating (> 90% accuracy).

Research Question:

Can sentiment analysis from Amazon customer review text reliably predict whether a customer will give a high or low satisfaction rating?

Narrative Paragraphs:

Amazon is a largely recognizable company with large amounts of public data in which they use for a variety of site improvements. Often when people are shopping they will look for a rating rather than individual reviews. Thus, identifying what sentiments lead to these lower or higher reviews is crucial in order to make business improvements and increase profits for any company.

Sentiment analysis is a widely used technique for extracting emotional tone from text data, and sentiment scores from text reviews are often correlated with rating systems, but there may be inconsistency due to sarcasm, mixed opinions, or contextual language. By applying sentiment analysis to Amazon review text and comparing it to customer ratings, we aim to evaluate how well sentiment-based methods can predict satisfaction levels and identify cases where written sentiment and numeric ratings differ.

Modeling Approach:

We will preprocess review text using standard natural language processing techniques, including tokenization, stop-word removal, and text normalization [1]. Sentiment scores will be generated using a rule-based sentiment analysis method such as VADER, which is designed for short, opinionated text and has been shown to perform well on online reviews [2]. The sentiment scores can then be used as features in a classification model, such as logistic regression, to predict whether a review corresponds to a high or low rating. Model performance will be evaluated using metrics such as accuracy, precision, recall, F1, and correlation between predicted sentiment and actual ratings. This approach allows us to assess both the predictive power and limitations of sentiment analysis in modeling customer satisfaction.

References:

[1] Mustapha Tijani, "The Complete Guide to NLP Text Preprocessing: Tokenization, Normalization, Stemming, Lemmatization, and More," DEV Community, Nov. 14, 2025. https://dev.to/themustaphatijani/the-complete-guide-to-nlp-text-preprocessing-tokenization-normalization-stemming-lemmatization-50ap.

[2] C. Hutto and E. Gilbert, "VADER: a Parsimonious Rule-Based Model for Sentiment Analysis of Social Media Text," *Proceedings of the International AAAI Conference on Web and Social Media*, vol. 8, no. 1, May 2014, doi: https://doi.org/10.1609/icwsm.v8i1.14550.