Sentiment Analysis

The goal of this python model is to perform sentiment analysis on a dataset of product reviews. It will categorize reviews as either positive, neutral or negative. This will allow manufacturers to know how well their products do with consumers.

Description of Dataset

The data consisted of a list of 5000 consumer reviews for Amazon products like the Kindle, Fire TV Stick, and more provided by Datafiniti's Product Database. The dataset includes basic product information, rating, review text, and more for each product.

Source:
https://www.kaggle.com/datasets/datafiniti/consumer-reviews-of-amazon-products

Preprocessing of Data

This step was broken down into four stages:

1. The “reviews.text” was selected for analysis.
2. Any empty review was dropped, though none was found.
3. Duplicate reviews were dropped which reduced the dataset from 5000 reviews to 4385.
4. For sentiment analysis, “stop words” were ignored.

Evaluation of Results

After all preprocessing was completed, the model commenced its analysis of the reviews, and categorized them into positive, neutral and negative reviews. The results were:

- 3932 positive reviews
- 254 neutral reviews, and
- 199 negative reviews.

This suggested that customers were overwhelmingly satisfied with the Amazon products. Five samples were selected from each category. Based on observation of these samples (and some others), the results of the sentiment analysis were generally accurate - though a few did stand out. Particularly, one neutral review appeared to

actually be positive and so a similarity check was run against all other reviews at a threshold of 86%. The results revealed that:

- 327 positive reviews were similar,
- 31 neutral reviews were similar, and
- 12 negative reviews were similar.

This suggested that the neutral review in question resonated well with 327 positive reviews and could mean that the other 43 similar reviews were misidentified as negative or neutral when they should have been positive. However, further investigation of individual reviews would need to be done to support this claim.

Model Strengths and Limitations

Generally, the model does a really good job of classifying the reviews based on their sentiment. However, there are several cases where the review gets misclassified. This often happens when ‘positive’ words are used to describe negative experiences or ‘negative’ words to describe positive experiences.