

## 1. Key Findings

### 1. Sentiment Distribution:

- The majority of reviews were **positive** (scores 4-5), indicating that most customers were satisfied with the products.
- A smaller proportion of reviews were **negative** (scores 1-2), highlighting areas where products or services could be improved.
- **Neutral** reviews (score 3) were the least common, suggesting that customers tend to have strong opinions (either positive or negative).

### 2. Text Insights:

- **Positive reviews** frequently contained words like "love", "great", "perfect", and "amazing", reflecting customer satisfaction.
- **Negative reviews** included words like "bad", "worst", "disappointed", and "broken", indicating dissatisfaction or issues with the product.

### 3. Model Performance:

- The **Logistic Regression** model achieved good accuracy in classifying sentiments.
- The model performed well in distinguishing between positive and negative reviews but struggled slightly with neutral reviews, which is common due to their ambiguous nature.

### 4. Preprocessing Impact:

- Text preprocessing steps (lowercasing, removing punctuation, stopwords, and lemmatization) significantly improved the quality of the data and the model's performance.
- Cleaned and standardized text data allowed the model to focus on meaningful words and patterns.