Air Fryer Product Reviews Classification - PDF Report

Problem Statement

With the rapid growth of e-commerce, customer reviews provide valuable insights into product performance. However, due to the high volume of reviews, it is challenging to analyze them manually. This project aims to classify air fryer product reviews into positive and negative sentiments using Natural Language Processing (NLP) and Neural Networks to help businesses understand customer satisfaction better.

Methodology

- **Data Preprocessing**: Reviews were cleaned by lowercasing, removing punctuation, stopwords, and applying tokenization and lemmatization.
- **Embeddings**: Word embeddings were used to convert text into numerical vectors.
- **Model Building**: Three deep learning models were developed:
  - Basic Neural Network
  - Artificial Neural Network (ANN)
  - Long Short-Term Memory (LSTM)
- **Training & Evaluation**: The models were trained and evaluated using accuracy, precision, recall, and F1-score metrics.

Insights

- Confusion matrices showed that ANN and LSTM performed better than the basic neural network.
- While ANN had slightly better recall, LSTM had higher precision.
- Both models significantly outperformed the baseline model.
- When it comes to choosing one model, LSTM is considered. Because it is better at handling sequential data.

Challenges

- Creating additional records as my dataset contains only 35 unique records.
- Handling imbalance labels.

Conclusion

Both ANN and LSTM models proved effective in classifying air fryer product reviews. Although their accuracy was similar, LSTM is better suited for sequential data like text reviews, making it the preferred model for this project.