ASPECT BASED SENTIMENT ANALYSIS ON AMAZON.COM AND AMAZON.IN - FASHION AND SKINCARE

Elvia Dey and Anaya Chakrawarti

Project

Performing ABSA on Amazon fashion and beauty product reviews and comparing the sentiments on the same brands and product types between global Amazon users (Amazon.com) and Indian Amazon users (Amazon.in)

- We scraped data on higher to lower end brands in the fashion and skincare category prominently sold on both Amazon.com and Amazon.in: Van Heusen, U.S. Polo Assn, Jockey, Minimalist and Nivea
- We identified the sentiment polarity (positive, neutral or negative) of the reviews
- We observed whether certain aspects found in reviews are region specific and in what way they differ
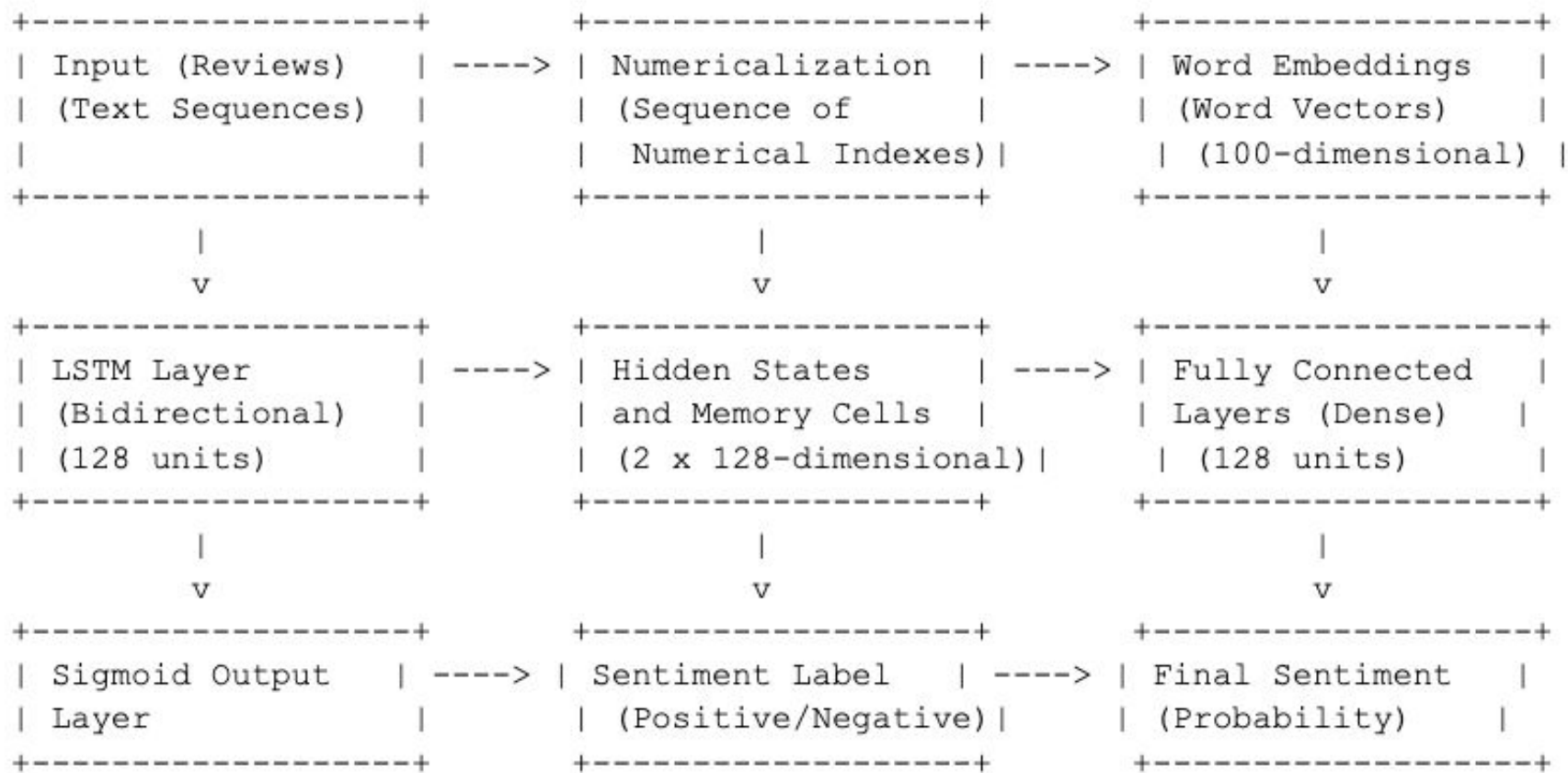
Database

4	Like the coulor
5	Very pleased 😀
5	I got this for my husband as a gift and it is very nice quality, very soft, and looks great.
5	Great robe looks expensive and feels great
5	My husband loves it 😂 got it for his bday and he doesn't take it off.

- The data was scraped for similar products found on both platforms
- Preprocessing steps such as handling emojis, lowercase, removing stopwords, word tokenizing, stemming and lemmatization were performed on the database
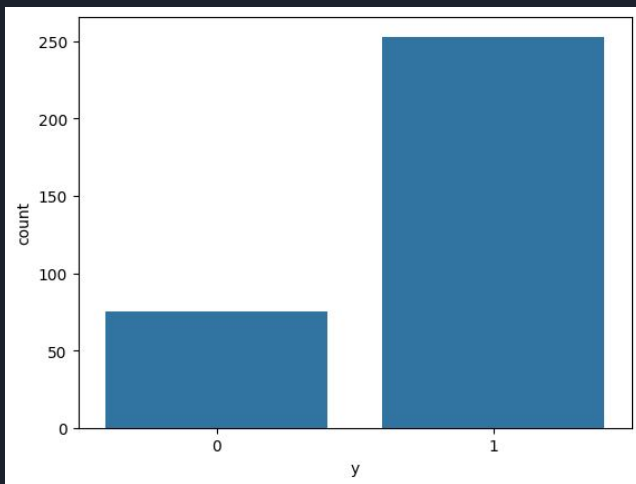- Reviews for data were collected brand-wise, with the user rating and review

Method

- Used Beautifulsoup to web scrape reviews

- LSTM based PyTorch neural network model

- Word embeddings using gensim FastText word vectors

- Used LDA to find aspect labels since the dataset is unlabelled

- Bidirectional LSTM layer, capturing context forward and backwards

- Fully connected (dense) layers after the LSTM layer (ReLU and sigmoid activation functions)

- The loss function is binary cross-entropy

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+--------------------------+        +--------------------------+        +--------------------------+
| Input (Reviews)      | ----> | Numericalization    | ----> | Word Embeddings      |
| (Text Sequences)     |        | (Sequence of        |        | (Word Vectors)       |
|                      |        | Numerical Indexes)  |        | | (100-dimensional) |
+--------------------------+        +--------------------------+        +--------------------------+
            |                                  |                                  |
            v                                  v                                  v
+--------------------------+        +--------------------------+        +--------------------------+
| LSTM Layer           | ----> | Hidden States       | ----> | Fully Connected      |
| (Bidirectional)      |        | and Memory Cells    |        | Layers (Dense)       |
| (128 units)          |        | (2 x 128-dimensional)|       | (128 units)          |
+--------------------------+        +--------------------------+        +--------------------------+
            |                                  |                                  |
            v                                  v                                  v
+--------------------------+        +--------------------------+        +--------------------------+
| Sigmoid Output       | ----> | Sentiment Label     | ----> | Final Sentiment      |
| Layer                |        | (Positive/Negative) |        | (Probability)        |
+--------------------------+        +--------------------------+        +--------------------------+
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Results - Van Heusen

Amazon.com

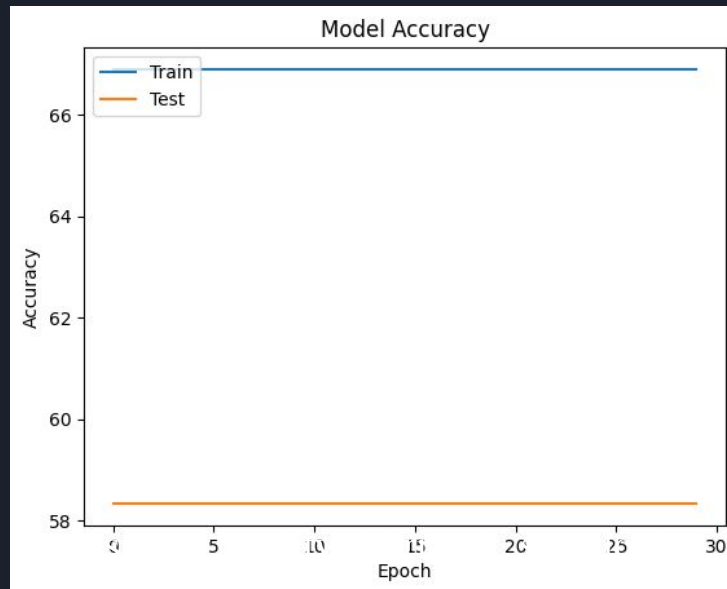Aspects: quality, fabric, fit, size, look

Amazon.in
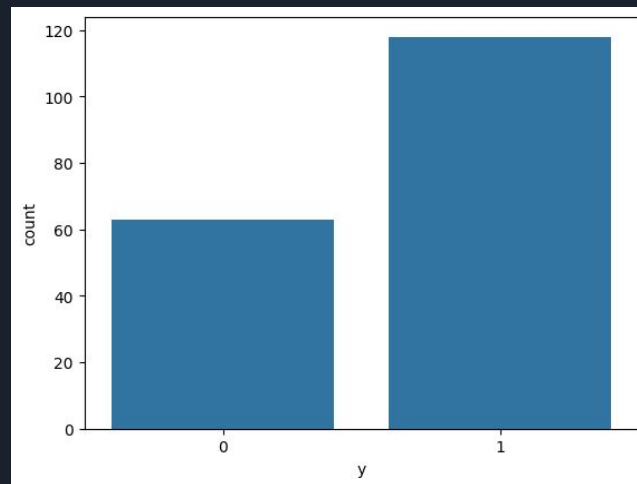
Aspects: material, look, quality, fit, money, feel
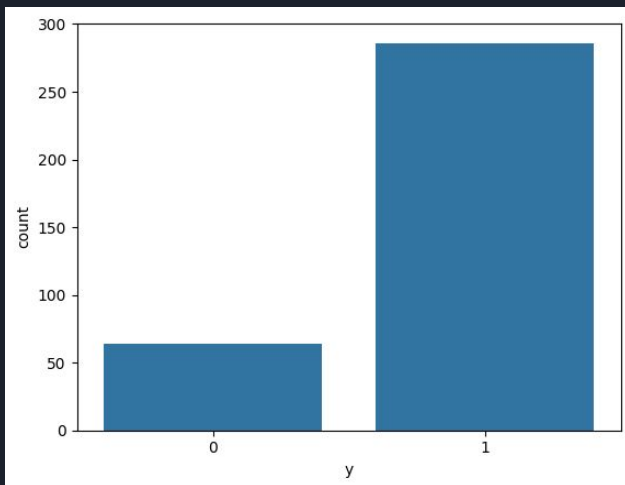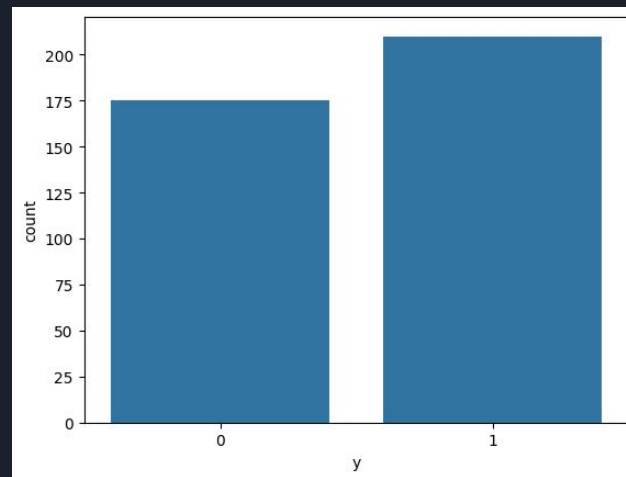
Results - Van Heusen
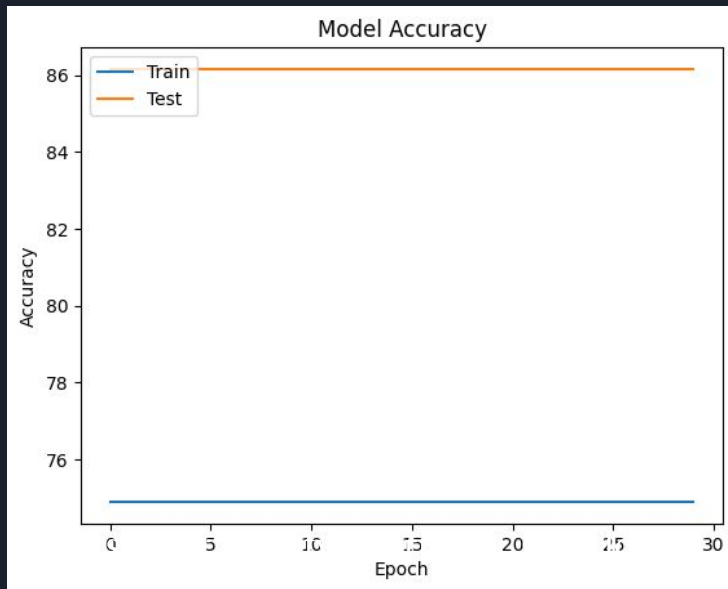
Amazon.com

Amazon.in

Results - U.S. Polo Assn.

Amazon.com
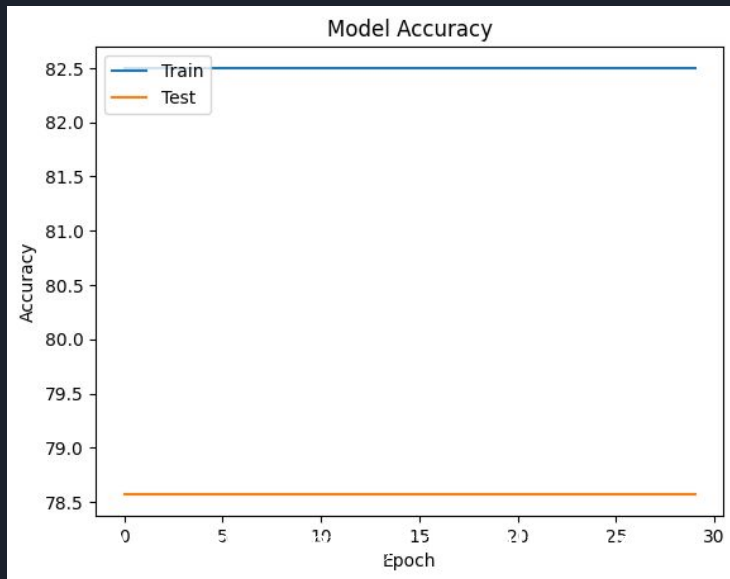

Aspects: material, fit, quality, size

Amazon.in
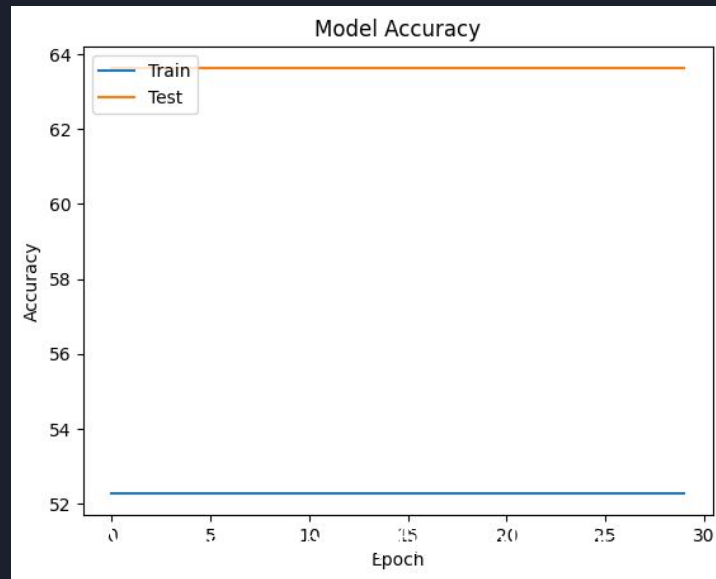

Aspects: material, fit, comfort, quality, size
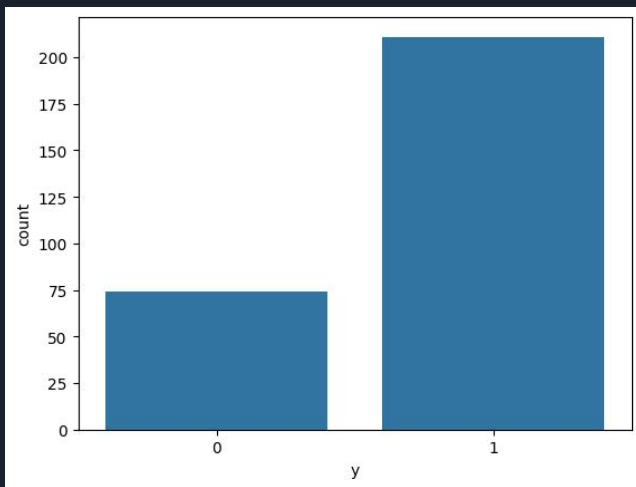
Results - U.S. Polo Assn.

Amazon.com

Amazon.in

Results - Jockey

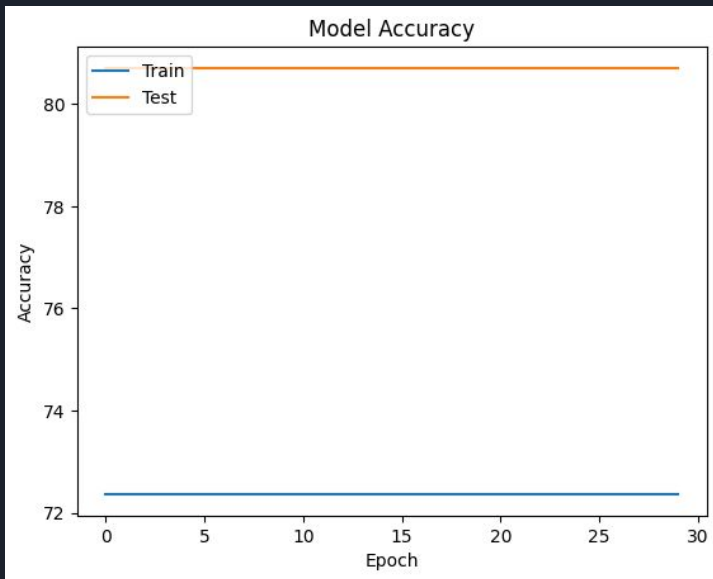Amazon.com

Aspects: material, quality, fit, comfort, size

Amazon.in
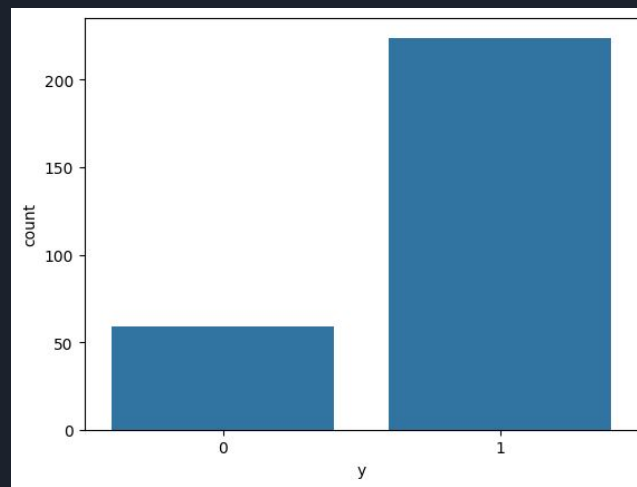
Aspects: material, quality, fit, size, comfort

Results - Jockey

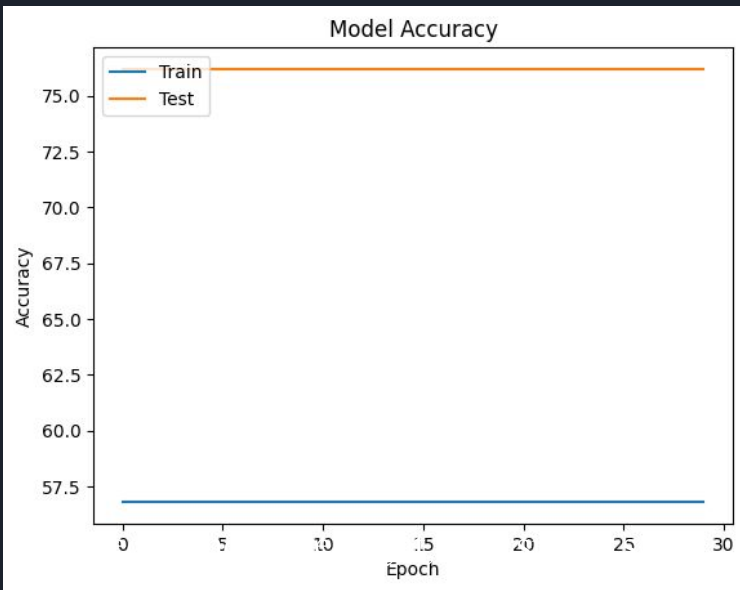Amazon.com

Amazon.in
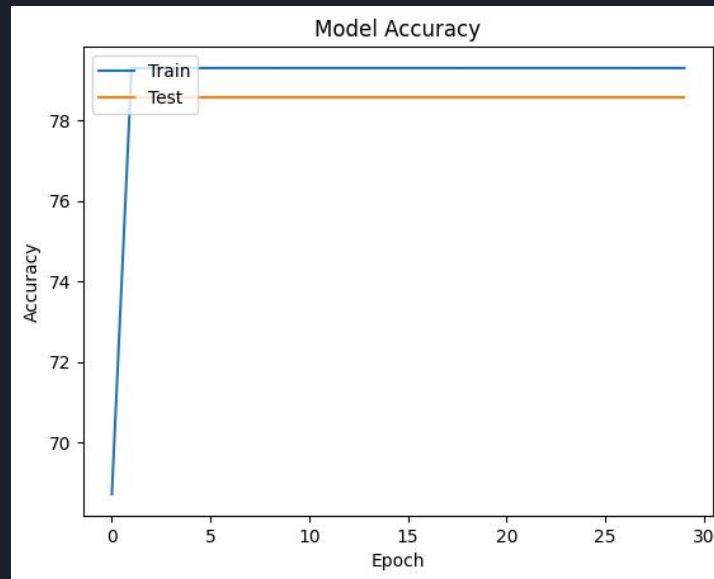
Results - Minimalist

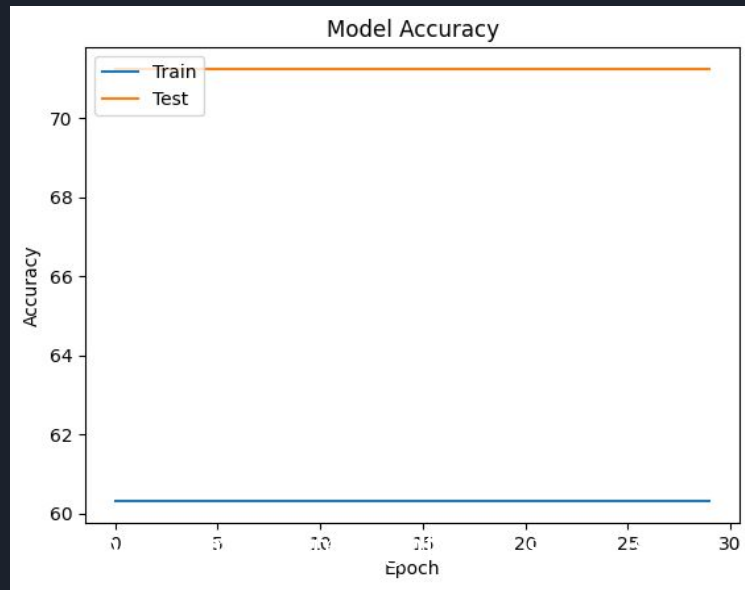Amazon.com
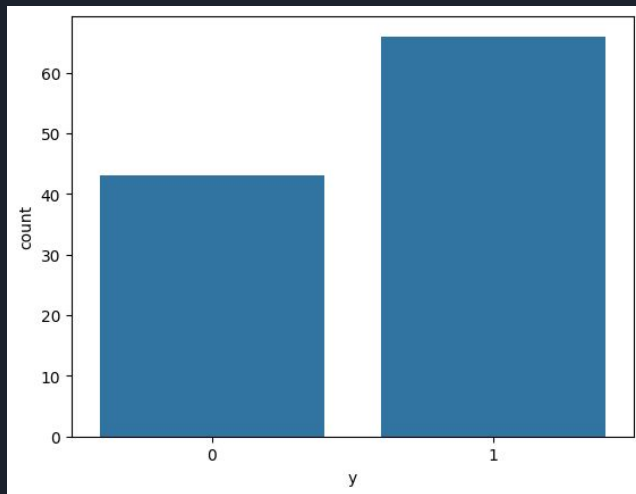
Amazon.in

Aspects: skin, dry, oily
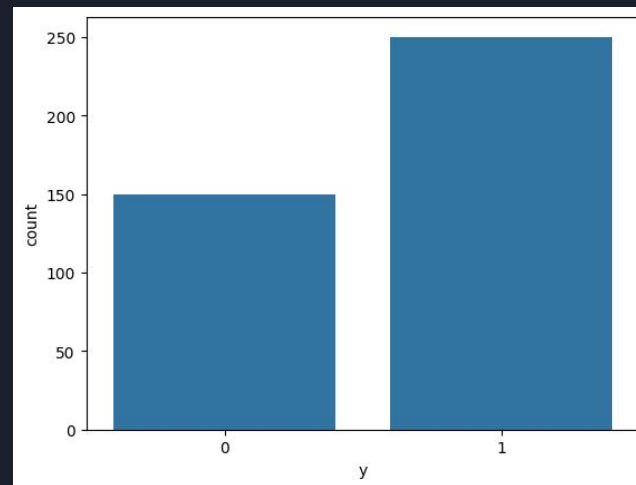
Aspects: sticky, skin, dry, smooth
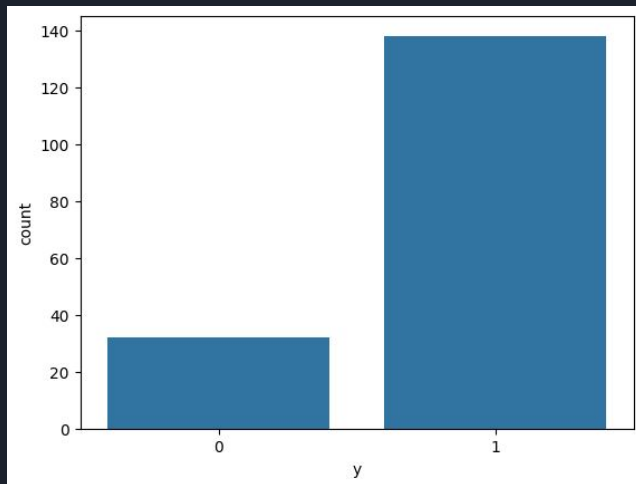
Results - Minimalist

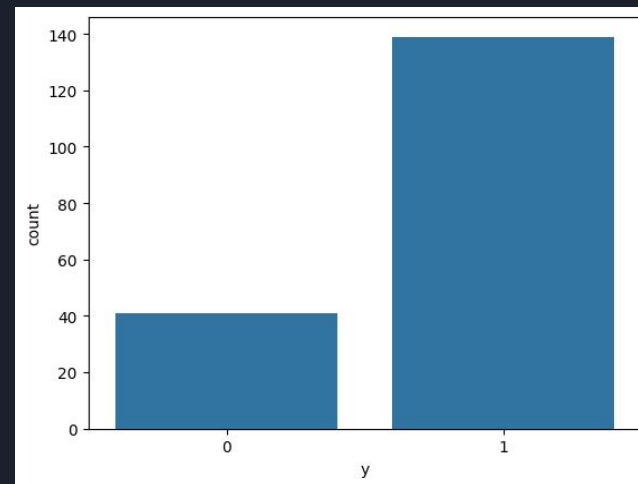## Amazon.com

Amazon.in

Results - Nivea

Amazon.com
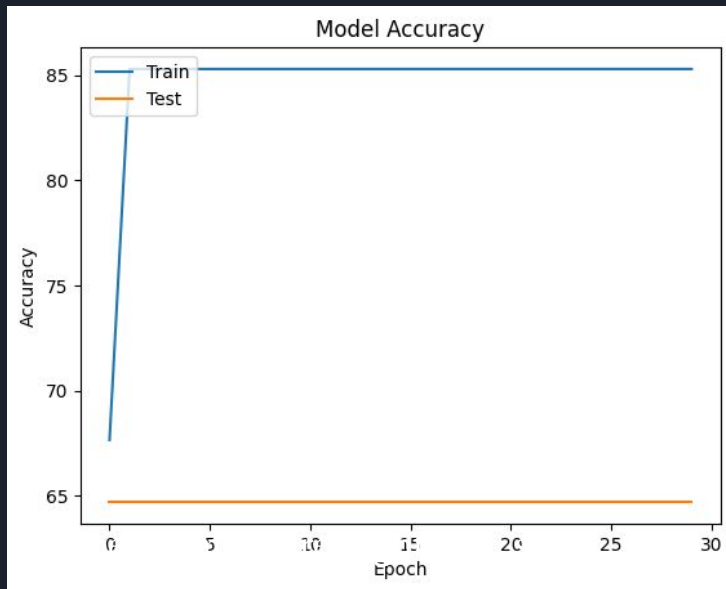

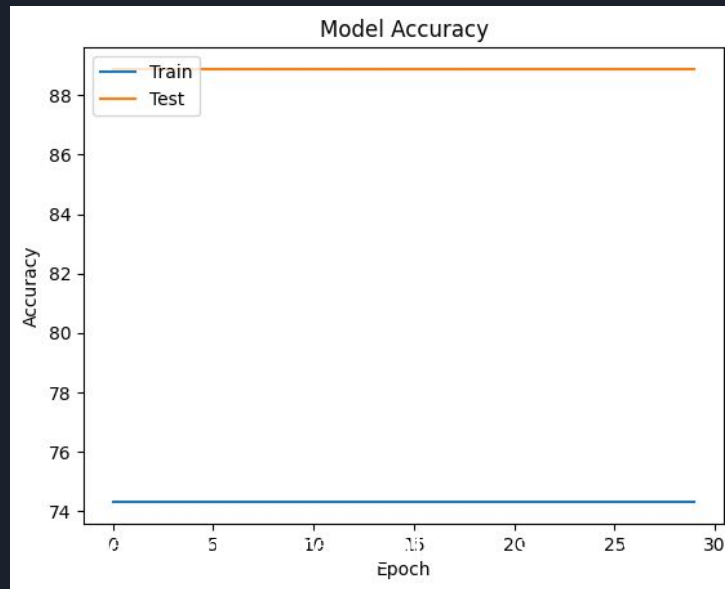Aspects: moisture, light, dry, smell, scent

Amazon.in

Aspects: moisture, scent, smooth, oil, dry

Results - Nivea

Amazon.com

Amazon.in

Conclusion - Insights

- Money was a factor in Indian consumer reviews of a higher end brand (Van Heusen)

- Indian consumers found products across the higher end Minimalist brand to be sticky (345 out of about 400 reviews mentioned it as a factor)

- There were more reviews and more branded products for men that could be found across Amazon.com and Amazon.in than for/reviewed by women

- Since these brands are popular both internationally and in India, the sentiment for each aspect and the overall ratings tend to be largely positive