Cos Skin

Your Skin But Better

A Skincare Recommendation System
by Clare Seah

Background

Quite often, we find ourselves suffering from decision fatigue when presented with too many choices. This is prevalent in the skincare industry, where shoppers are often overwhelmed by the countless skincare brands and products.

This is where the Cos Skin recommender comes in - to recommend tailored skincare products based upon a basic 5-step skincare routine.

The Routine

Step 1

Data Collection

Step 2

Data Cleaning
& EDA

Step 3

Modelling

Step 4

Web Application

Step 5

Conclusion

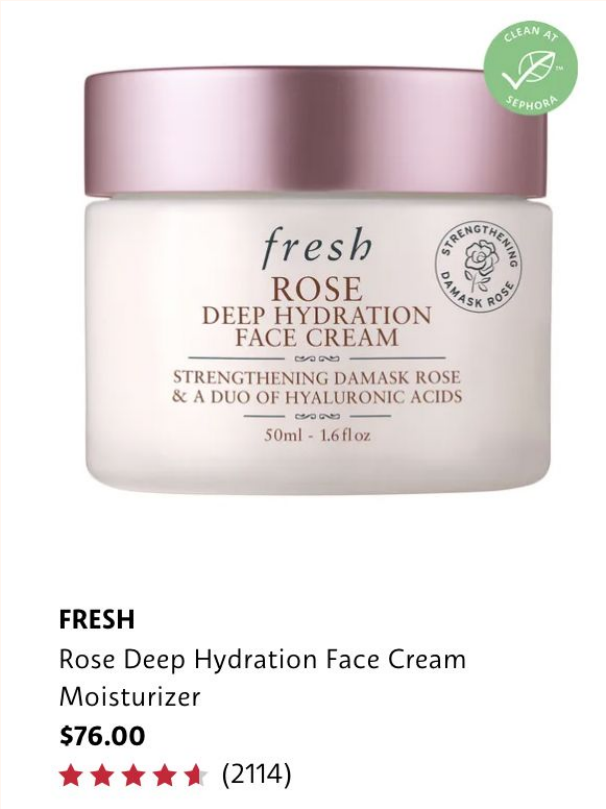
01.

Data Collection

Web Scraping

Basic Product Information by Category

- ✨ Name
- ✨ Brand
- ✨ Price
- ✨ Image
- ✨ Rating
- ✨ Number of reviews
- ✨ Sephora Exclusive label
- ✨ Description
- ✨ Ingredients



02.

Data Cleaning & EDA

Data Cleaning

DESCRIPTION

Function: Face, Moisturise, Treatment
Skin Type: Combination, Dry, Normal, Oily
Skin Concerns: Dryness, Oiliness
Finish: Radiant
Formulation: Balm
Skincare By Age: 20s, 30s, 40s, 50+, Under 20

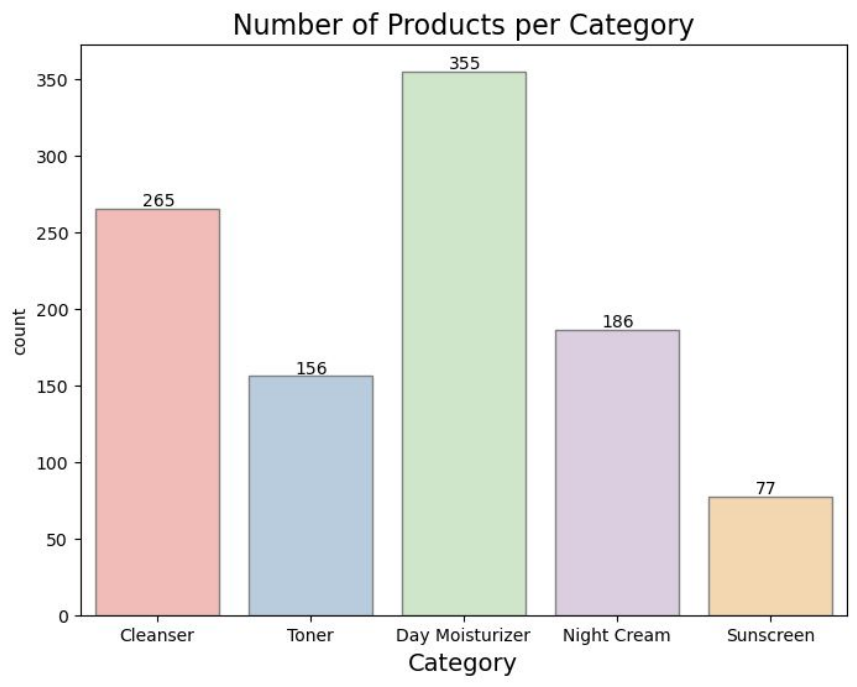
The basis of the recommender will be based on product description

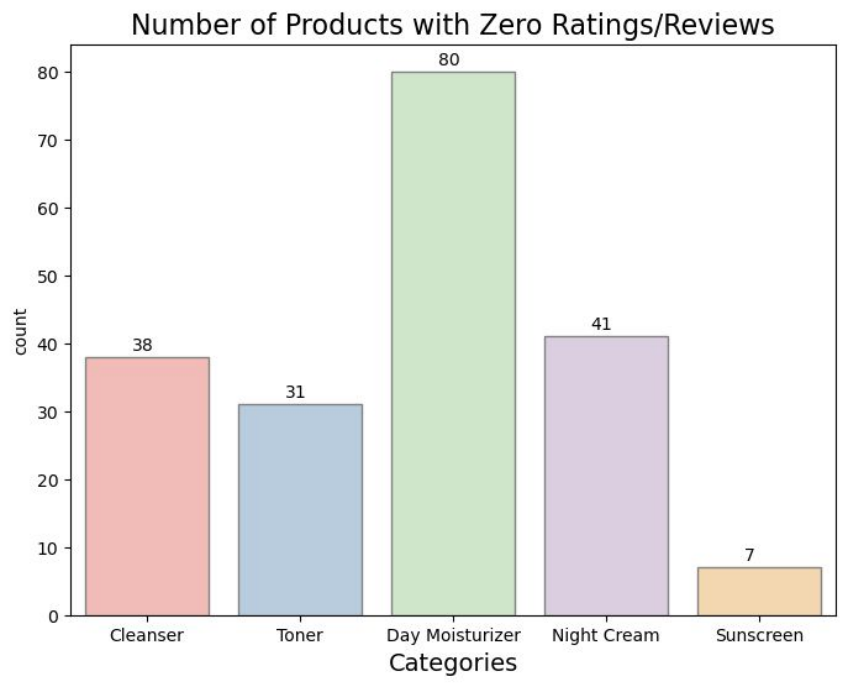
- Extracted as a paragraph
- Use RegEx to split attributes into individual columns
- Manually search to impute products with no description/missing values for some attributes
- Dummify the values (pre-processing)

Data Cleaning

- Impute missing ratings with median rating value
- Dropped products with ‘Men’ in their name
- Drop ‘Jack Black’ brand which is only for men
- Dropped products with ‘Box’ or ‘Kit’ in their name

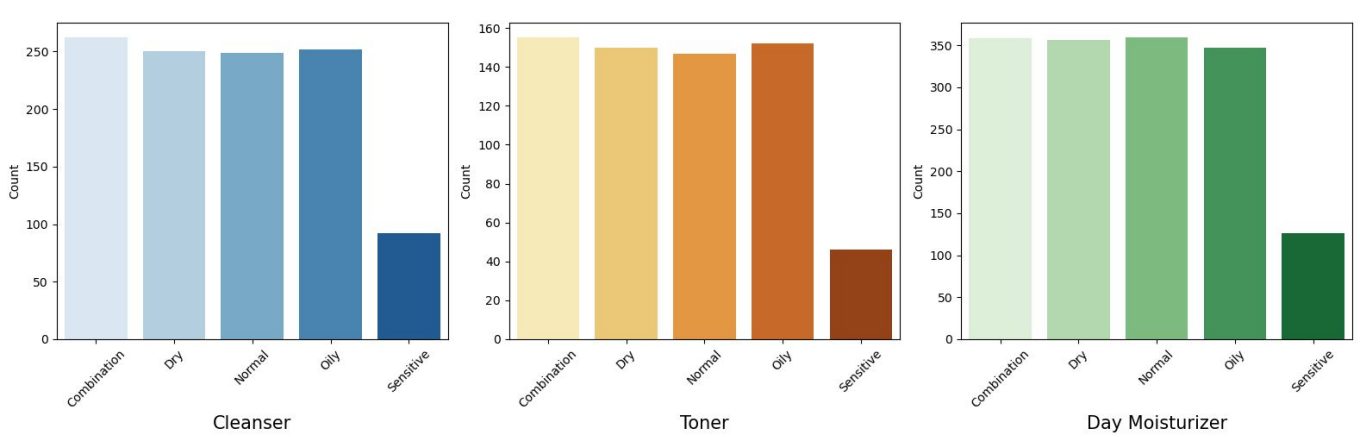
EDA

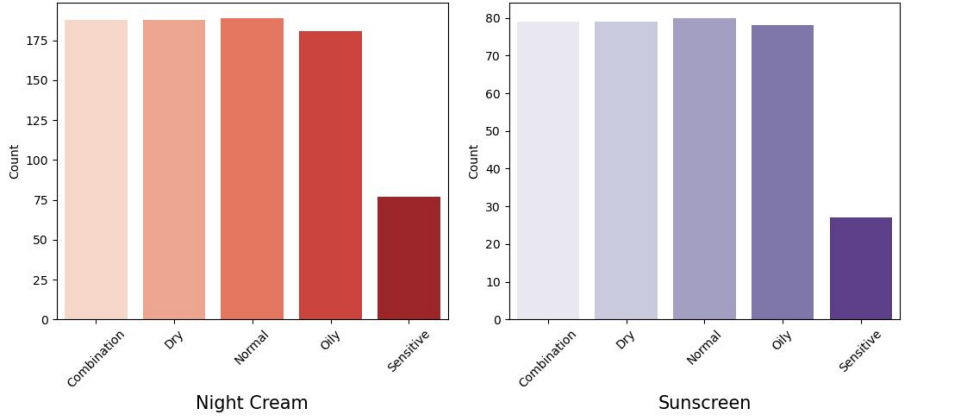




- Data was scraped on 9th November, Sephora would have launched new seasonal products
- Products with 0 ratings make up about 20% of each category.
- Imputed missing ratings with the median value

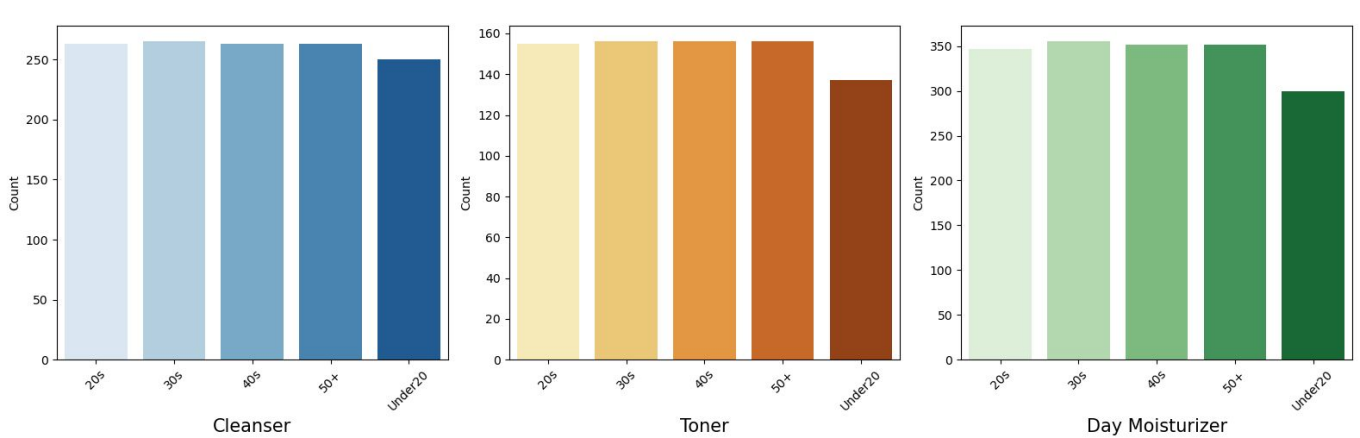
Skin Type Filter Tags

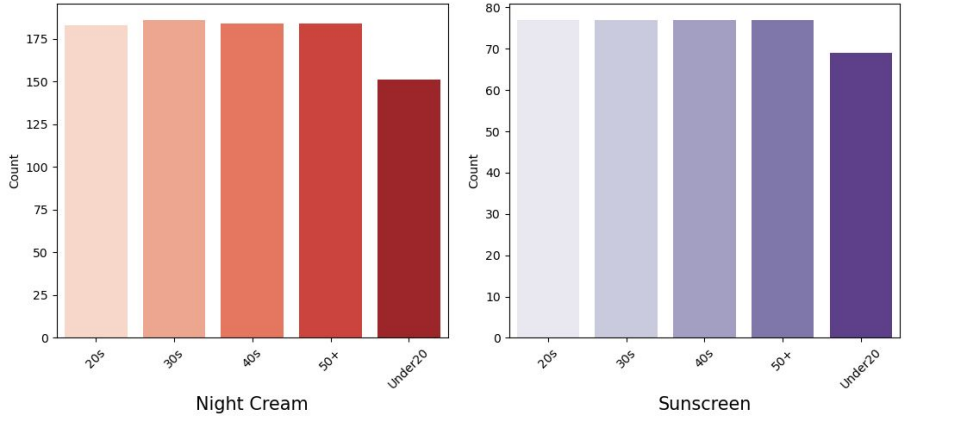




- Most of the products are tagged with every skin type filter.
- Only ‘Sensitive’ is tagged to less than half of the products in each category.

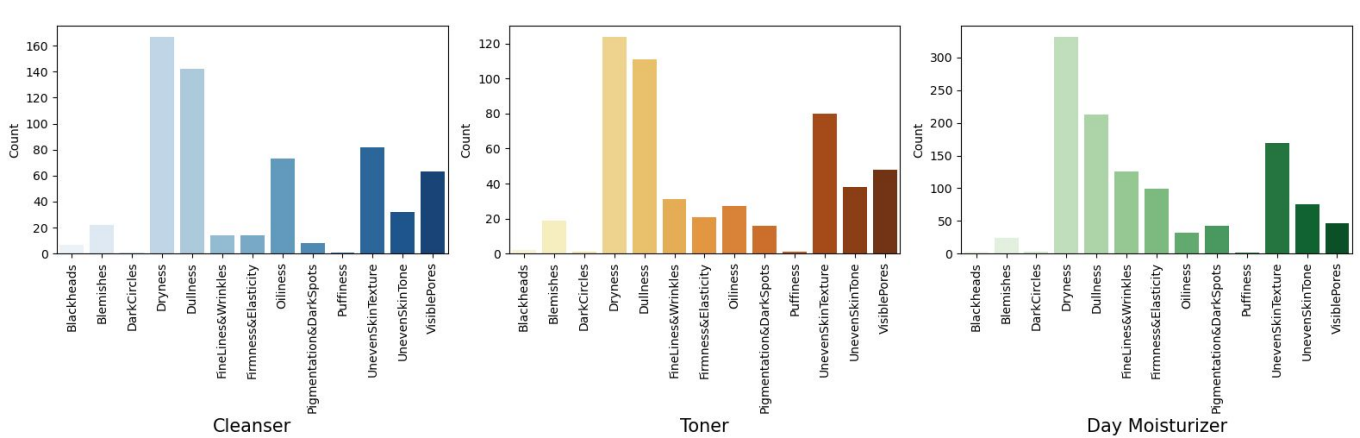
Age Filter Tags

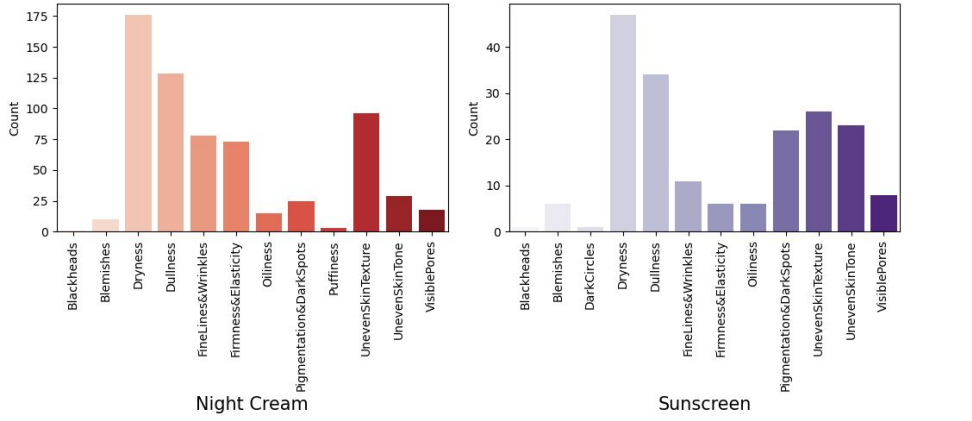




- Most of the products are tagged with every age filter.
- ‘Under 20’ tag makes up only slightly lesser than the total number of products in each category

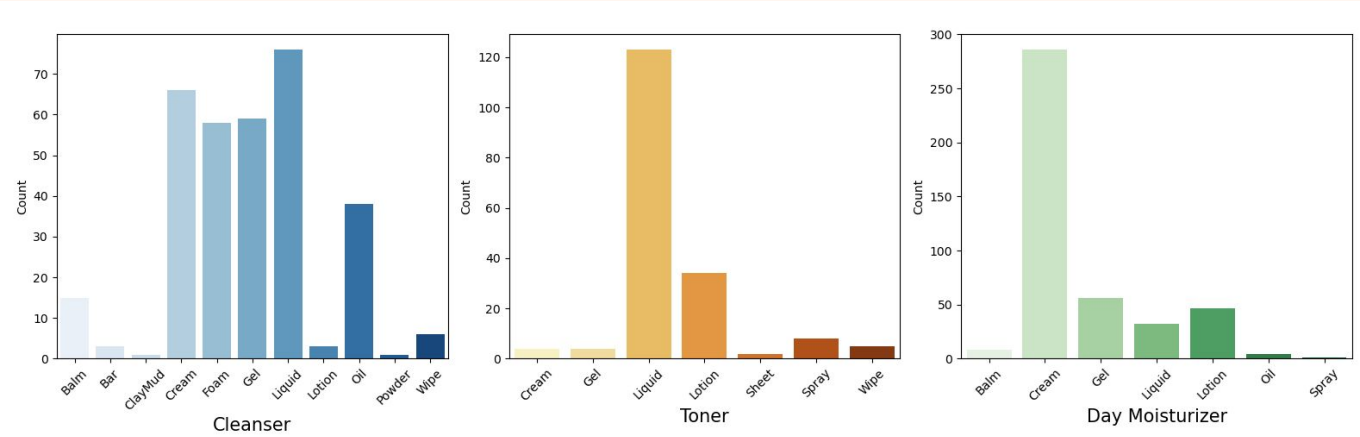
Skin Concerns Filter Tags

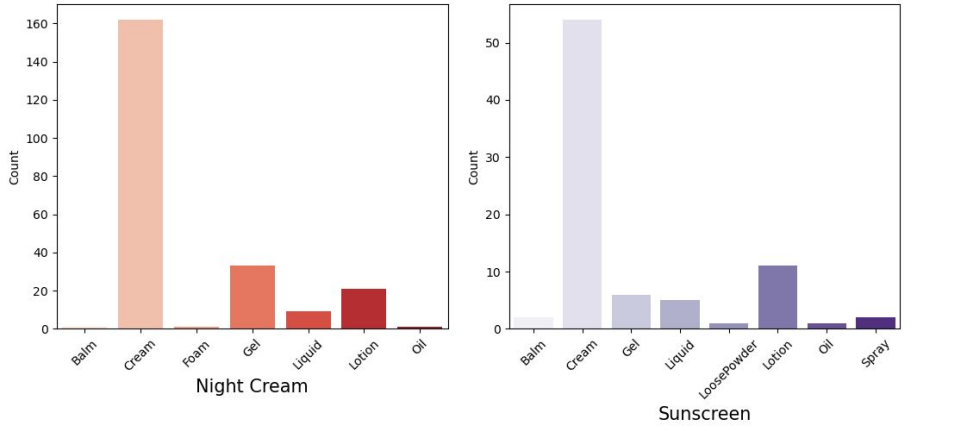




- More variation in tags compared to the first two filter types.
- Dryness is the top filter tag across categories

Product Formulation Filter Tags





- More variation in tags compared to the first two filter types.
- Cream being the most commonly preferred formulation for most categories

03.

Modelling

Profile-Based Recommendation
(Cosine Similarity)

Weights given to filter types:

- Skin_type = 1
- Age = 1
- Rating = 1.5
- Formulation = 2
- Skin_concerns = 3

```
cleanser_user_profile['20s'] = 1
cleanser_user_profile['Oily'] = 1
cleanser_user_profile['Cream'] = 2
cleanser_user_profile['Oiliness'] = 3
cleanser_user_profile['rating'] = 1.5
```

SKIN INC-Pure Serum Infused O2 Cleanser	14.50
FARMACY-Whipped Greens oil-free foaming cleanser	13.90
INNISFREE-Volcanic Pore Cleansing Foam EX	13.75

04.

Web Application

Streamlit

Input 👵

Takes in 4 attributes

✨ User's age
✨ User's skin type
✨ User's skin concerns (if any)
✨ User's formulation preferences (if any)

Output 💆‍♀️

Recommends 5 different products for a complete skincare routine

✨ Cleanser
✨ Toner
✨ Day moisturizer
✨ Night Cream
✨ Sunscreen

https://cos-skin.streamlit.app/

05.

Conclusion

Limitations

- As the data collected is from Sephora, the tags are manually labelled and accuracy of filters tagging cannot be assured.
- User reviews and ratings include those from Sephora US as well. Since Sephora US has a larger and more active customer base, the ratings maybe influenced by US customers. Due to the difference in climate and environments, as well as skin types, the user ratings may not be very applicable to customers in Singapore.

Future Work

- Add more skincare categories (Mask, Serum, Eye cream etc)
- Allow users to select categories to create their own skincare routine
- Support additional filtering by brands and price ranges
- Look into product ingredients to determine the use and effectiveness of the product
- Sentiment analysis on reviews to incorporate user sentiment in the recommender
- Add in user-based recommendations by obtaining user's purchase history, reviews and beauty profile

“Ageing is a fact of life.
Looking your age is not. ”

— Dr Howard Murad

Thank You!

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