
An Explorative Analysis & Predictive Modelling on Nykaa's Top K- Beauty Brands in 2024

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01 Introduction

Skincare – whenever we heard of it,
K-Beauty is the Global Leader &
Game Changer.

The innovation and science in Korean
Beauty is rapidly transforming Indian
skincare market, with e-commerce
like Nykaa – the most trusted e-
commerce in India for international
K-Beauty.



02 Objectives

- Detailed analysis on top 20 K-Beauty brands and their products in market
- The Science behind K-Beauty
- Prediction and analysis on price in market
- Recommending products to new customer

03 Dataset Review

- The data is collected on available information till October, 2024 from Nykaa.
- The dataset has 16 variables –
 1. Brand Name (Top 20 K-Beauty brands on Nykaa)
 2. Established On
 3. Product Name (430 unique products)
 4. Quantity
 5. Price
 6. Rating
 7. Total Reviews
 8. Product Formulation
 9. Skin Type (5 different skin types)
 10. Main Ingredients
 11. Product Type (15 K-Beauty products)
 12. Product Specialty (13 different functions)
 13. Paraben Label (Yes/No)
 14. Mineral Oil Label (Yes/No)
 15. Vegan Label (Yes/No)
 16. Fragrance Label (Yes/No)

04 Analysis

Descriptive
Analysis

Inferential
Statistics

Natural
Language
Processing

Regression &
Machine
Learning

Recommendation
System

Descriptive Analysis

➤ Top 5 Brands on Nykaa –

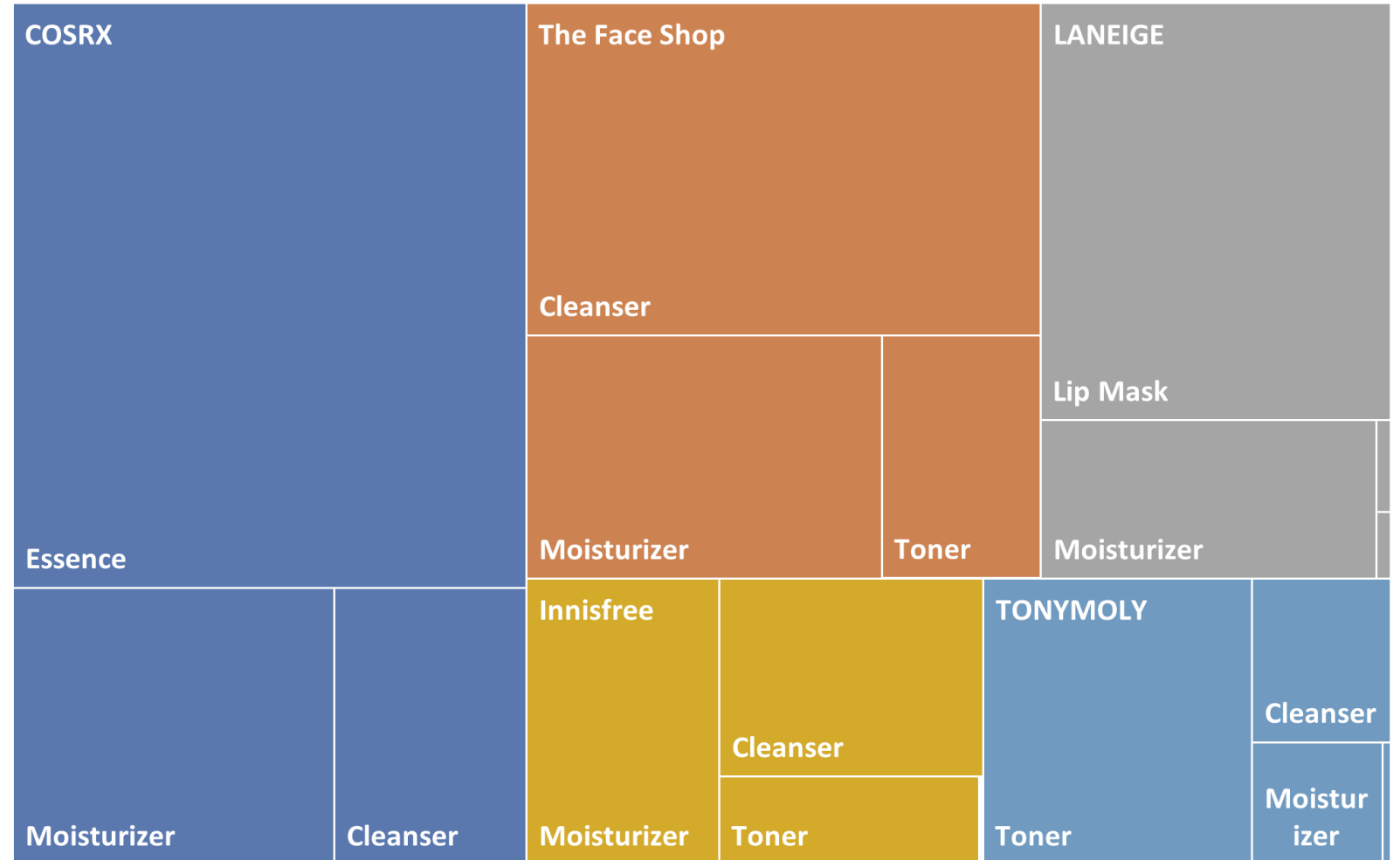
1. COSRX
2. The Face Shop
3. LANEIGE
4. Innisfree
5. TONYMOLY

➤ Top 5 K-Beauty Products on Nykaa –

1. Moisturizer
2. Essence
3. Cleanser
4. Toner
5. Lip Mask

- A detailed insight on all products from top 20 K-Beauty brands for better understanding is presented next.

TOP 5 K-BEAUTY BRANDS' SHARE IN 5 TOP MOST-SOUGHT AFTER ITEMS



Sl. No.	Segments	Products included	Average Price (Rs.)	Average Quantity (gm.)	Specializations	Dominating Brand	People's Choice	Top Rated Product
A	Detoxification	Cleansing Oil, Cleanser, Exfoliator	1100	150	Deep Cleanse	The Face Shop	The Face Shop (All)	Rice Water Bright Foaming Cleanser (The Face Shop)
B	Target Specific Mask	Clay Mask, Mask, Peel-Mask, Night Mask	1300	75	-	-	LANEIGE (Night Mask), Innisfree (Clay Mask)	Super Volcanic Pore Clay Mask (Innisfree)
C	Skin Balancing Solution	Toner, Essence	1500	150	Hydration	COSRX, TONYMOLY	COSRX (Essence), TONYMOLY (Toner)	Advanced Snail 96 Mucin Power Essence (COSRX)
D	Treatment Potion	Serum	1850	30	Brightening, Rejuvenating	It's Skin	Innisfree, COSRX	Hyaluronic Acid Green Tea Seed Serum (Innisfree)
E	Skin Conditioning	Emulsion, Moisturizer	1800	60	Hydration, Moisturization	Innisfree	COSRX (Moisturizer), The Face Shop (All)	Jeju Aloe Fresh Soothing Gel (The Face Shop)
F	Skin Protective Shield	Sunscreen	1800	50	Protection, Hydration	Thank You Farmer	Beauty of Joseon	Relief Sunscreen Rice & Probiotics SPF 50+ PA++++ (Beauty of Joseon)
G	Eye Care	Eye Cream	1705	25	Dark Circle, Puffy Eyes	It's Skin, Klairs, LANEIGE, The Face Shop	Beauty of Joseon	Advanced Snail Peptide Eye Cream (COSRX)
H	Lip Care	Lip Mask	1420	20	Hydration, Nourishment	LANEIGE	LANEIGE	Lip Sleeping Mask Watermelon (LANEIGE)

Inferential Statistics

Test of Association

Fisher Freeman Halton Test Assumptions-

- a. Categorical
- b. Independence of observations
- c. Mutually Exclusive Groups

Null Hypothesis – No significant difference between two features

Alternative Hypothesis – Significant difference between two features

Level of Significance – $\alpha = 0.05$

Testing Results on Segments



Skin Type – Product Formulation

- Detoxification

Skin Type – Product Speciality

- Detoxification
- Skin Balancing Solution
- Treatment Potion
- Skin Conditioning

Product Type – Product Formulation

- Detoxification
- Target Specific Mask
- Skin Conditioning

Product Type – Product Speciality

- Detoxification

Natural Language Processing



K-Beauty philosophy –
“ QUALITY over QUANTITY ”

A holistic approach to skincare that focuses
on long-term results rather than achieving
quick, overnight results.

New age Korean Ingredients



Special Concerns

- BHA - Clarifying
- Hyaluronic Acid – Hydration & Moisturization
- Niacinamide – Brightening & Rejuvenating

Top-tier for Skin Types

- Black Tea – anti-oxidant for Normal Skin
- Centella – soothing for Sensitive Skin
- Hyaluronic Acid – humectant for Dry Skin
- Green Tea – oil-control for Oily Skin

Vegan Label

- Hyaluronic Acid

Top 10 Ingredients –

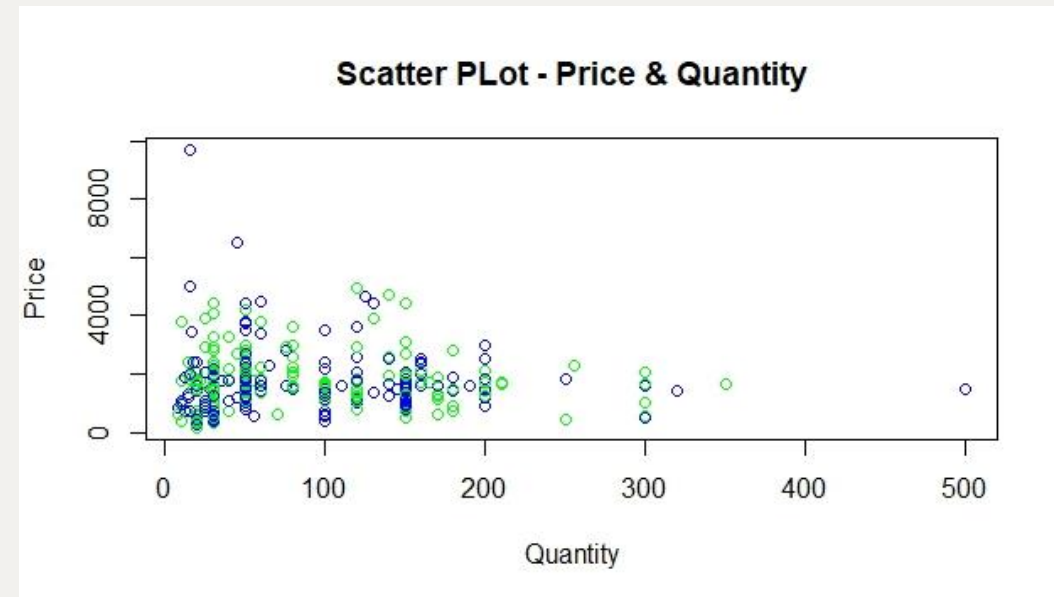
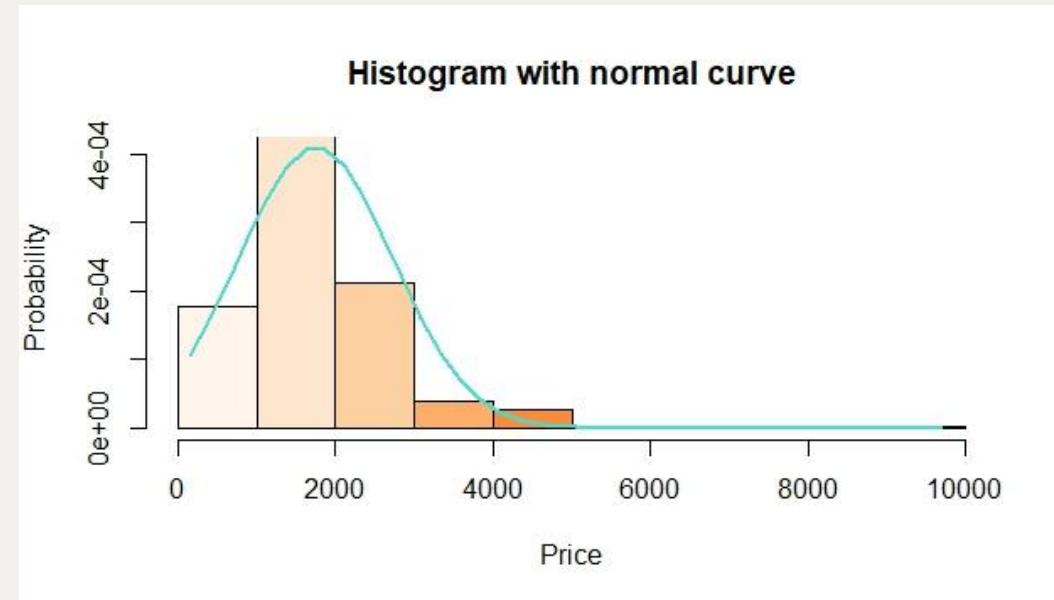
1. Hyaluronic Acid
2. Niacinamide
3. Ceramide
4. Vitamin B5
5. Centella
6. Vitamin C
7. Green Tea
8. Collagen
9. Rice
10. Peptide



Regression & Machine Learning

Pre-requisites

- Price is not NORMALLY DISTRIBUTED, positively skewed.
- Shapiro-Wilk test confirms that the distribution is not Normal, with 5% level of significance. ($W = 0.8529$, $p\text{-value} = 2.2e-16$)
- Price and Quantity not linearly related. (Non-linear relation may exist)



HYPOTHESES TESTING

Kruskal-Wallis Test Assumptions-

- a. Non-normal, skewed distribution
- b. Two or more independent groups
- c. Randomness, at least 5 observation groups in sample

Null Hypothesis – No significant difference between groups.

Alternative Hypothesis – significant difference between groups.

Level of Significance – $\alpha = 0.05$

Testing Outcomes



Factors influencing price

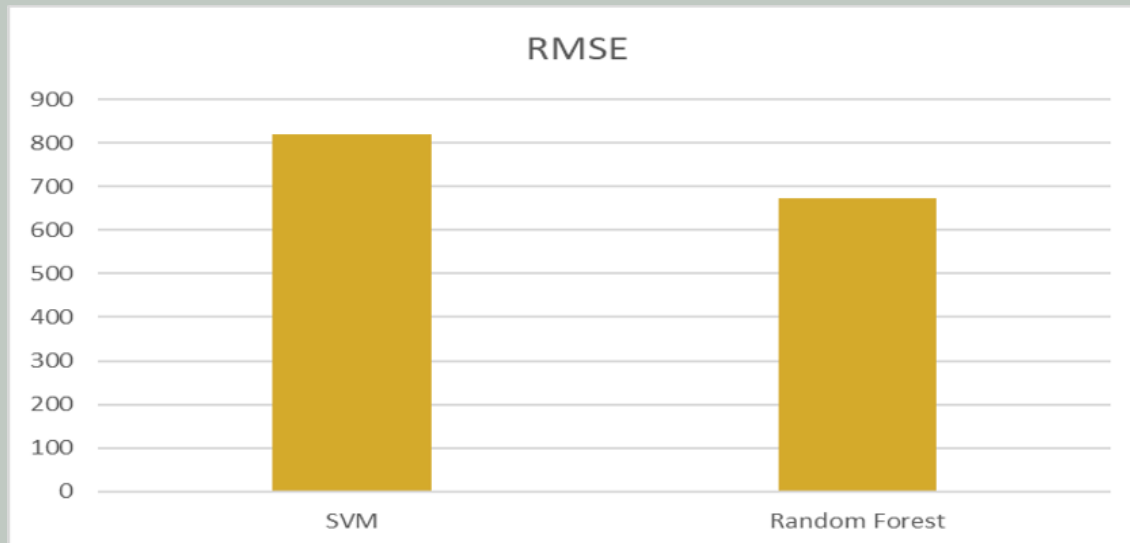
- K-Beauty Brands
- Product Types
- Product Speciality

Non-dominating ones

- Skin Types
- Product Formulation
- Vegan Label

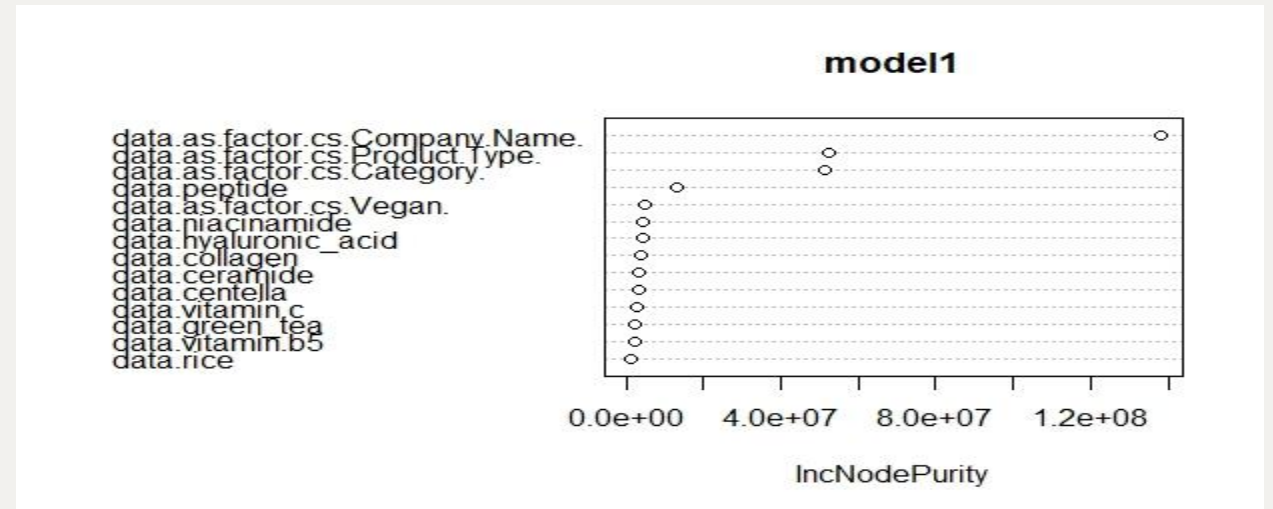
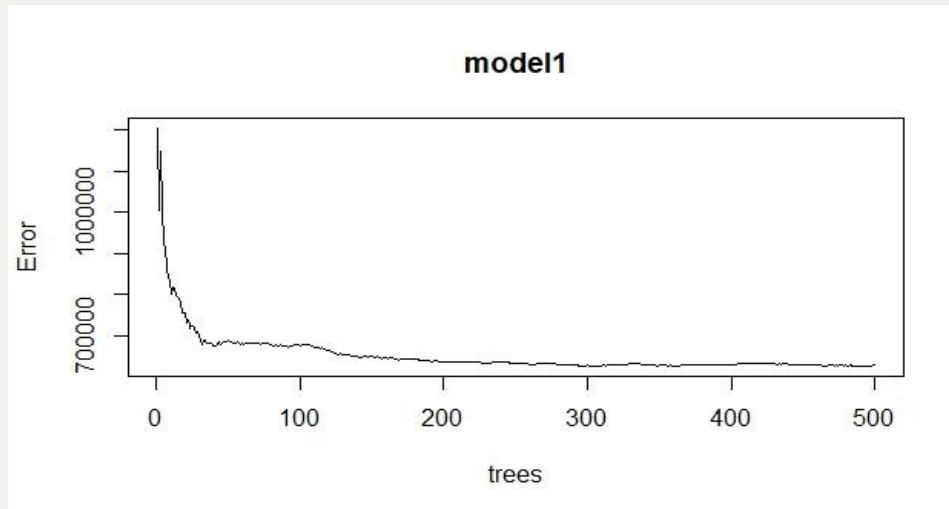
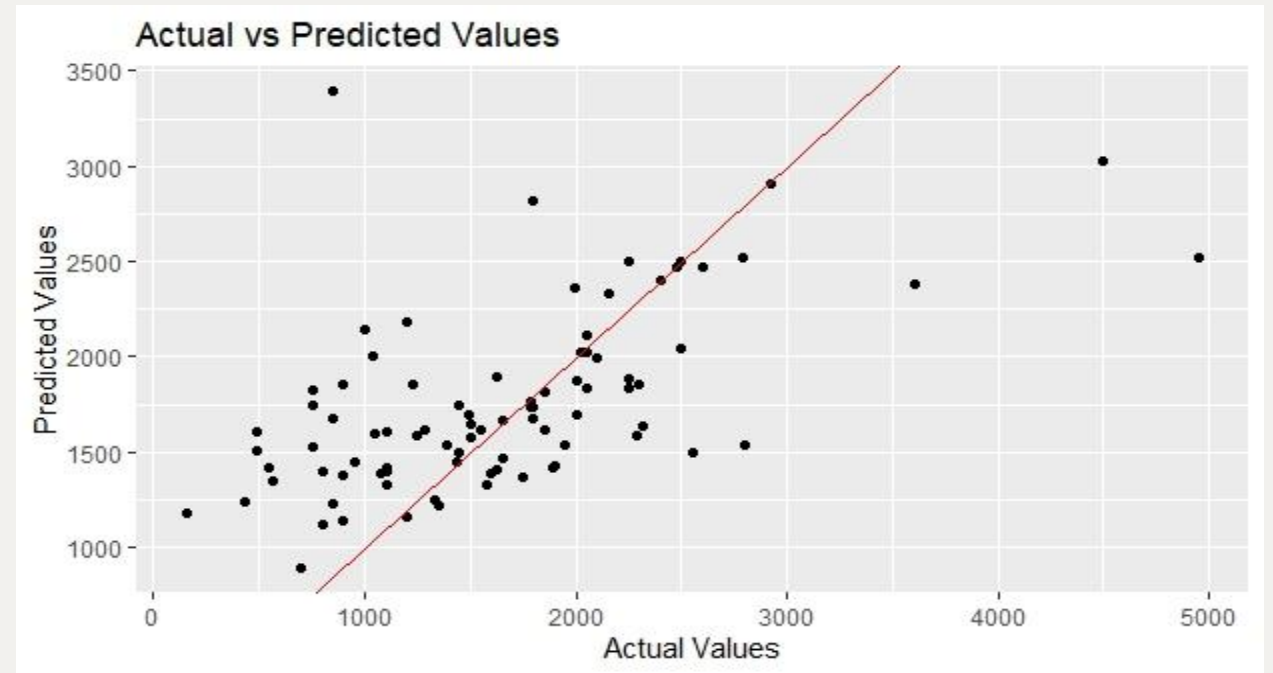
Regression

- i. Transformed categorical data into factors using encoding method
- ii. Split the data – 80% for training, 20% for testing
- iii. Fit the Regression model on training data
- iv. Predicted on testing data



- Random Forest – Regression Fitting
- Support Vector Machine – RBF Kernel to map data in high dimensional space

- The Random Forest Regression model was better than SVM model that predicted product price based on -
 - i. Brand Name
 - ii. Product Type
 - iii. Product Speciality
 - iv. Vegan
 - v. Top 10 most used Ingredients



Recommendation System

Mechanism & Outcome

Output -

Top 10 similar Cleanser to Green Tea Hydrating Amino Acid Foam Cleanser:

Product Name

Green Tea Fresh Cleanser	0.474316
Green Tea Cleansing Water	0.388465
The Chok Chok Green Tea Foam Cleanser	0.341005
Hyaluronic Acid Low pH Cleansing Foam	0.278206
Bye Bye Blackhead 30 Days Miracle Green Tea Tox Bubble Cleanser	0.196650
The Chok Chok Green Tea Cleansing Water	0.166953
Herb Day 365 Face Wash Amino Acid	0.163396
Salicyclic Acid Daily Gentle Cleanser	0.155245
Aqua Bomb Jelly Cleanser	0.107743
Green Plum Refreshing Cleanser	0.100835

1. User selects a product

2. Ingredients are analyzed

3. Similar ingredients are generated

4. Products with Google link are recommended

05 Closing

Best K-Beauty Brands

COSRX, The Face Shop, LANEINGE ruled the market

Love the Skin You're In

Every product is designed for special target with top-notch ingredients

Machine Learning Model Prediction

Random Forest gave a good fit on price

Be Minimalist

Products & Formulation are unique for each skin, each requirement

Dynamic Pricing

Brand image, Product type & Product specialities are the mains

Personalized Content Based Recommendation System

Provided powerful suggestions to new customers

LIMITATIONS OF THE STUDY

- i. Disadvantages of secondary data.
- ii. Covered only essentials for a beauty routine.
- iii. We could not access the total sales of products as it was unavailable but Nykaa has the policy to rate a product if one has purchased and used it. So, the total number of reviews can also be taken as an approximate measure for total sales.

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THANK YOU