

BEAUTY PRODUCTS AND SENTIMENT ANALYSIS

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PROBLEM STATEMENT

The beauty market is highly competitive, with products ranging from budget-friendly options to premium-priced luxury items. Understanding consumer engagement with products across different price tiers is crucial for brands to position themselves effectively.

POTENTIAL AUDIENCE

A large cosmetic company is looking to launch a sister brand into the beauty industry.

product_id	product_name	brand	loves	count	rating	reviews	size	variation_type	variation_val	variation_desc	ingredients	price_usd	highlights	primary_cate	secondary_c	tertiary_cate	child_count	child_max_pi	child_min_pi
P473671	Fragrance Di	6342	19-69	6320	3.6364	11					[Capri Eau de	35	[Unisex/ Gen Fr	Unisex/ Gen Fr	Value & Gift	Perfume Gift	0		
P473668	La Habana E	6342	19-69	3827	4.1538	13	3.4 oz/ 100 mL	Size + Conce	3.4 oz/ 100 mL		[Alcohol Den	195	[Unisex/ Gen Fr	Unisex/ Gen Fr	Women	Perfume	2	85	30
P473662	Rainbow Bar	6342	19-69	3253	4.25	18	3.4 oz/ 100 mL	Size + Conce	3.4 oz/ 100 mL		[Alcohol Den	195	[Unisex/ Gen Fr	Unisex/ Gen Fr	Women	Perfume	2	75	30
P473660	Kasbah Eau d	6342	19-69	3018	4.4762	21	3.4 oz/ 100 mL	Size + Conce	3.4 oz/ 100 mL		[Alcohol Den	195	[Unisex/ Gen Fr	Unisex/ Gen Fr	Women	Perfume	2	75	30
P473658	Purple Haze I	6342	19-69	2691	3.2308	13	3.4 oz/ 100 mL	Size + Conce	3.4 oz/ 100 mL		[Alcohol Den	195	[Unisex/ Gen Fr	Unisex/ Gen Fr	Women	Perfume	2	75	30
P473661	Kasbah Eau d	6342	19-69	2448	4.4762	21	0.25 oz/ 7.5 mL	Size + Conce	0.25 oz/ 7.5 mL Eau de Parf		[Alcohol Den	30	[Warm & Spic Fr	Unisex/ Gen Fr	Unisex/ Gen Fr	Women	Rollerballs &	0	
P473659	Purple Haze I	6342	19-69	1619	3.2308	13	0.25 oz/ 7.5 mL	Size + Conce	0.25 oz/ 7.5 mL		[Alcohol Den	30	[Unisex/ Gen Fr	Unisex/ Gen Fr	Unisex/ Gen Fr	Women	Rollerballs &	0	
P473666	Invisible Post	6342	19-69	1542	3.625	8	3.4 oz/ 100 mL	Size + Conce	3.4 oz/ 100 mL		[Alcohol Den	195	[Unisex/ Gen Fr	Unisex/ Gen Fr	Women	Perfume	2	75	30
P472300	Capri Eau de	6342	19-69	35714	3.5714	7	3.4 oz/ 100 mL	Size + Conce	3.4 oz/ 100 mL Eau de Parf		[Alcohol Den	195	[Fresh Scent Fr	Unisex/ Gen Fr	Women	Perfume	2	75	30
P473667	Invisible Post	6342	19-69	1377	3.625	8	0.25 oz/ 7.5 mL	Size + Conce	0.25 oz/ 7.5 mL		[Alcohol Den	30	[Unisex/ Gen Fr	Unisex/ Gen Fr	Women	Rollerballs &	0		
P473663	Rainbow Bar	6342	19-69	1371	4.25	18	0.25 oz/ 7.5 mL	Size + Conce	0.25 oz/ 7.5 mL		[Alcohol Den	30	[Unisex/ Gen Fr	Unisex/ Gen Fr	Women	Rollerballs &	0		
P473670	Capri Eau de	6342	19-69	1206	3.5714	7	0.25 oz/ 7.5 mL	Size + Conce	0.25 oz/ 7.5 mL		[Alcohol Den	30	[Unisex/ Gen Fr	Unisex/ Gen Fr	Women	Rollerballs &	0		
P473664	L'air Barbès	6342	19-69	981	3	4	3.4 oz/ 100 mL	Size + Conce	3.4 oz/ 100 mL Eau de Parf		[Alcohol Den	195	[Fresh Scent Fr	Unisex/ Gen Fr	Women	Perfume	2	75	30
P473665	L'air Barbès	6342	19-69	721	3	4	0.25 oz/ 7.5 mL	Size + Conce	0.25 oz/ 7.5 mL		[Alcohol Den	30	[Unisex/ Gen Fr	Unisex/ Gen Fr	Women	Rollerballs &	0		
P476416	AFRICANA Be	6471	54 Thrones	1928	4.3256	268	8 oz / 180 mL	Scent	Ugandan Vanilla + Ethiopia	[Butyrosper	38	[Clean at Sej Bath & Body	Body Moistur	Body Lotions	0	38	12	12	
P476418	African Beau	6471	54 Thrones	7526	3.561	41				[Egyptian Van	29	[Good for: Dr Bath & Body	Value & Gift	Value & Gift	Value & Gift	0			
P476417	African Beau	6471	54 Thrones	3741	4.2273	22				[Egyptian Van	80	[Good for: Dr Bath & Body	Value & Gift	Value & Gift	Value & Gift	0			
P503832	Mini AFRICA	6471	54 Thrones	3392	4.5175	143	1 oz / 30 mL	Scent	Ugandan Vanilla and Ethiopia	[Butyrosper	12	[Clean at Sej Bath & Body	Body Moistur	Body Lotions	2	12	12	12	
P483068	ABBOTT Sam	6485	ABBOTT	4493	4.8163	49				[Big Sky"; Wi	26	[Vegan; Wo	Unisex/ Gen Fr	Value & Gift	Value & Gift	Perfume Gift	0		
P483139	The Cape Per	6485	ABBOTT	3118	4.6111	18	1.7 oz / 50 mL	Size + Conce	1.7 oz / 50 mL Eau de parfum	[Water, Deni	84	[Clean + Plai Fr	Unisex/ Gen Fr	Women	Perfume	1	29	29	
P483080	Crescent Bea	6485	ABBOTT	1957	4.7778	9	0.33 oz / 10 mL	Size + Conce	0.33 oz / 10 mL Eau de parfum spray	[Water, Deni	29	[Vegan; Clei Fr	Unisex/ Gen Fr	Women	Rollerballs &	0			
P483079	Crescent Bea	6485	ABBOTT	1608	4.5882	17	1.7 oz / 50 mL	Size + Conce	1.7 oz / 50 mL Eau de Parfum	[Water, Deni	84	[Vegan; Clei Fr	Unisex/ Gen Fr	Women	Perfume	1	29	29	
P483131	Sequoia Eau	6485	ABBOTT	1458	4.1867	6	0.34 oz / 10 mL	Size + Conce	0.34 oz / 10 mL Eau de Parfum spray	[Water, Deni	29	[Vegan; Wo	Unisex/ Gen Fr	Women	Rollerballs &	0			
P483130	Sequoia Perf	6485	ABBOTT	1322	4.619	21	1.7 oz / 50 mL	Size + Conce	1.7 oz / 50 mL Eau de Parfum	[Water, Deni	84	[Clean + Plai Fr	Unisex/ Gen Fr	Women	Perfume	1	29	29	
P483108	Mojave Perf	6485	ABBOTT	1137	4.7143	7	0.33 oz / 10 mL	Size + Conce	0.33 oz / 10 mL Eau de parfum spray	[Water, Deni	29	[Vegan; Wo	Unisex/ Gen Fr	Women	Rollerballs &	0			
P483140	The Cape Per	6485	ABBOTT	1092	3.8333	6	0.34 oz / 10 mL	Size + Conce	0.34 oz / 10 mL Eau de parfum spray	[Water, Deni	29	[Vegan; Clei Fr	Unisex/ Gen Fr	Women	Rollerballs &	0			
P483072	Big Sky Eau d	6485	ABBOTT	975	4.25	4	0.27 oz / 8 mL	Size + Conce	0.27 oz / 8 mL Eau de Parfum	[Water, Deni	28	[Vegan; Wo	Unisex/ Gen Fr	Women	Rollerballs &	1	29	29	
P483071	Big Sky Eau d	6485	ABBOTT	966	4.625	9	1.7 oz / 50 mL	Size + Conce	1.7 oz / 50 mL Eau de parfum	[Water, Deni	84	[Clean + Plai Fr	Unisex/ Gen Fr	Women	Perfume	2	29	28	
P483110	Montecito Pe	6485	ABBOTT	897	3.7143	8	0.33 oz / 10 mL	Size + Conce	0.33 oz / 10 mL Eau de parfum spray	[Water, Deni	29	[Vegan; Wo	Unisex/ Gen Fr	Women	Rollerballs &	0			
P483109	Montecito Pe	6485	ABBOTT	828	4.1111	9	1.7 oz / 50 mL	Size + Conce	1.7 oz / 50 mL Eau de parfum	[Water, Deni	84	[Clean + Plai Fr	Unisex/ Gen Fr	Women	Perfume	1	29	29	
P483063	Mojave Eau d	6485	ABBOTT	805	4.6333	14	1.7 oz / 50 mL	Size + Conce	1.7 oz / 50 mL Eau de Parfum	[Water, Deni	84	[Clean + Plai Fr	Unisex/ Gen Fr	Women	Perfume	1	29	29	

DATA SET

Sephora product information
and over 8,000 products and 1
million reviews from Kaggle
ranging from 2008 to March
2023

author_id	rating	is_recommender	helpfulness	total_feedback	total_neg	for total_pos	sub submission	review title	skin_tone	eye_color	skin_type	hair_color	product_id	product_name	brand_name	price_usd
0 2190293206	2	0	0	0	0	0	3/19/23	Used to swear by this prod	lightMedium	brown	combination	brown	P443842	Retinol Anti-+ The INKEY Us	Retinol Anti-+ The INKEY Us	\$12.99
1 9113341005	5	1	0	0	0	0	3/18/23	Love only be more tolerable	deep	brown	normal	black	P443842	Retinol Anti-+ The INKEY Us	Retinol Anti-+ The INKEY Us	\$12.99
2 2 3866E+10	1	0	0	1	13	0	3/12/23	Why, why, why New formula	fairLight	blue	combination	blonde	P443842	Retinol Anti-+ The INKEY Us	Retinol Anti-+ The INKEY Us	\$12.99
3 1328806527	1	0	0.941176	17	1	16	3/12/23	I have used it Recently ref: light	light	brown	combination	gray	P443842	Retinol Anti-+ The INKEY Us	Retinol Anti-+ The INKEY Us	\$12.99
4 3 1263E+10	5	1	1	1	0	1	3/9/23	Great product Must have pr	lightMedium	hazel	combination	brown	P443842	Retinol Anti-+ The INKEY Us	Retinol Anti-+ The INKEY Us	\$12.99
5 3 8092E+10	4	1	1	1	5	0	5/16/23	I love being using this product twice a week and I love	seen results. My skin is smc	P443842	Retinol Anti-+ The INKEY Us	Retinol Anti-+ The INKEY Us	\$12.99			
6 5090375964	4	1	1	1	0	1	3/5/23	Decent serum Great size	gray	brown	combination	black	P443842	Retinol Anti-+ The INKEY Us	Retinol Anti-+ The INKEY Us	\$12.99
7 4 2426E+10	5	1	1	2	0	2	3/5/23	I recently bought No smell for r	fairLight	gray	combination	blonde	P443842	Retinol Anti-+ The INKEY Us	Retinol Anti-+ The INKEY Us	\$12.99
8 6768361454	1	0	0.909091	11	1	10	3/3/23	Been using this product for light	light	hazel	combination	brown	P443842	Retinol Anti-+ The INKEY Us	Retinol Anti-+ The INKEY Us	\$12.99
9 6860968769	1	0	0.80000001	15	3	12	3/1/23	I used to swe Threw up in n	lightMedium	blue	dry	brown	P443842	Retinol Anti-+ The INKEY Us	Retinol Anti-+ The INKEY Us	\$12.99
10 2 3687E+10	5	1	0.66666669	3	1	2	3/1/23	I have tried S My skin can't	porcelain	blue	dry	brunette	P443842	Retinol Anti-+ The INKEY Us	Retinol Anti-+ The INKEY Us	\$12.99
11 3 7269E+10	2	0	0.85714299	7	1	6	2/27/23	Smells so bad Smelly	light	blue	combination	blonde	P443842	Retinol Anti-+ The INKEY Us	Retinol Anti-+ The INKEY Us	\$12.99
12 8751720702	4	1	1	1	0	1	2/24/23	Very light white Nice product	fair	brown	dry	brown	P443842	Retinol Anti-+ The INKEY Us	Retinol Anti-+ The INKEY Us	\$12.99
13 5683470893	1	0	0	1	7	0	7/24/23	This is a wall C new formula	light	hazel	combination	black	P443842	Retinol Anti-+ The INKEY Us	Retinol Anti-+ The INKEY Us	\$12.99
14 2 3851E+10	2	0	0.60000002	5	2	3	3/20/23	LOVE the int Doesn't work	fairLight	blue	oily	auburn	P443842	Retinol Anti-+ The INKEY Us	Retinol Anti-+ The INKEY Us	\$12.99
15 4 8367E+10	4	1	0.66666669	3	1	2	2/15/23	I enjoy the pr Like the prod	fairLight	brown	oily	red	P443842	Retinol Anti-+ The INKEY Us	Retinol Anti-+ The INKEY Us	\$12.99
16 2 7639E+10	1	0	0.625	8	3	3	2/15/23	Smells awful. Sour smell is	fair	brown	normal	black	P443842	Retinol Anti-+ The INKEY Us	Retinol Anti-+ The INKEY Us	\$12.99
17 6442783656	4	1	0.80000001	5	1	4	2/13/23	Wish they m Love this ser	lightMedium	green	normal	brown	P443842	Retinol Anti-+ The INKEY Us	Retinol Anti-+ The INKEY Us	\$12.99
18 7778640948	1	0	0	1	5	0	5/13/23	I love been u Not same as the old one	lightMedium	brown	dry	black	P443842	Retinol Anti-+ The INKEY Us	Retinol Anti-+ The INKEY Us	\$12.99
19 3 3706E+10	5	1	1	2	0	2	2/13/23	Adm crazy a Must have pr	fair	brown	dry	brown	P443842	Retinol Anti-+ The INKEY Us	Retinol Anti-+ The INKEY Us	\$12.99
20 8228421510	1	0	0.88888902	9	1	8	2/10/23	The smell in t Smells horrit	medium	brown	combination	black	P443842	Retinol Anti-+ The INKEY Us	Retinol Anti-+ The INKEY Us	\$12.99
21 2 044E+10	2	0	0	1	6	0	6/29/23	I wish i saw a SMELLS BAD	lightMedium	brown	combination	black	P443842	Retinol Anti-+ The INKEY Us	Retinol Anti-+ The INKEY Us	\$12.99
22 2 7123E+10	1	0	0	1	11	0	11/28/23	PLEASE bring back the old f	light	hazel	combination	black	P443842	Retinol Anti-+ The INKEY Us	Retinol Anti-+ The INKEY Us	\$12.99
23 2 1582E+10	1	0	0	1	2	0	2/6/23	This was awful for me - clearly i	Adm in th	green	normal	black	P443842	Retinol Anti-+ The INKEY Us	Retinol Anti-+ The INKEY Us	\$12.99
24 5117068738	5	1	1	1	4	0	2/6/23	Holy guacamirale serum	light	hazel	normal	black	P443842	Retinol Anti-+ The INKEY Us	Retinol Anti-+ The INKEY Us	\$12.99
25 2 4595E+10	4	1	1	1	0	0	4/26/23	I love bought new formula	fair	brown	combination	black	P443842	Retinol Anti-+ The INKEY Us	Retinol Anti-+ The INKEY Us	\$12.99
26 2 4111E+10	2	0	0	0	0	0	0 2/5/23	Dries my skin Not for me	fairLight	blue	dry	brown	P443842	Retinol Anti-+ The INKEY Us	Retinol Anti-+ The INKEY Us	\$12.99
27 1480662380	1	0	0	1	1	0	0 2/5/23	This product A must have i	fairLight	brown	combination	brown	P443842	Retinol Anti-+ The INKEY Us	Retinol Anti-+ The INKEY Us	\$12.99
28 2 2101E+10	5	1	0	1	0	0	2/4/23	This is a gentle retinol soot	light	hazel	combination	blonde	P443842	Retinol Anti-+ The INKEY Us	Retinol Anti-+ The INKEY Us	\$12.99



HYPOTHESIS

Mid-priced personal care products receive a higher volume of reviews compared to premium or budget-priced alternatives, driven by a perceived balance between affordability and quality.

ASSUMPTIONS

- Mid-priced Products attract high engagements
- Engagement drives sales
- Historical Trends are predictive
- Consumer behavior are consistent

APPROACH

DATA CLEANING

- clean dataset
- Handle missing values, duplicate and outliers
- Merging Datasets

Tools: Python

DATA ANALYSIS

- Identify top-rated and most reviewed products and categories (skincare moisturizer, cosmetics)
- Prediction of customer engagement based on product features
- Identify overlooked segments or products
- Provide visualizations to support the findings

Tool: Python, Tableau



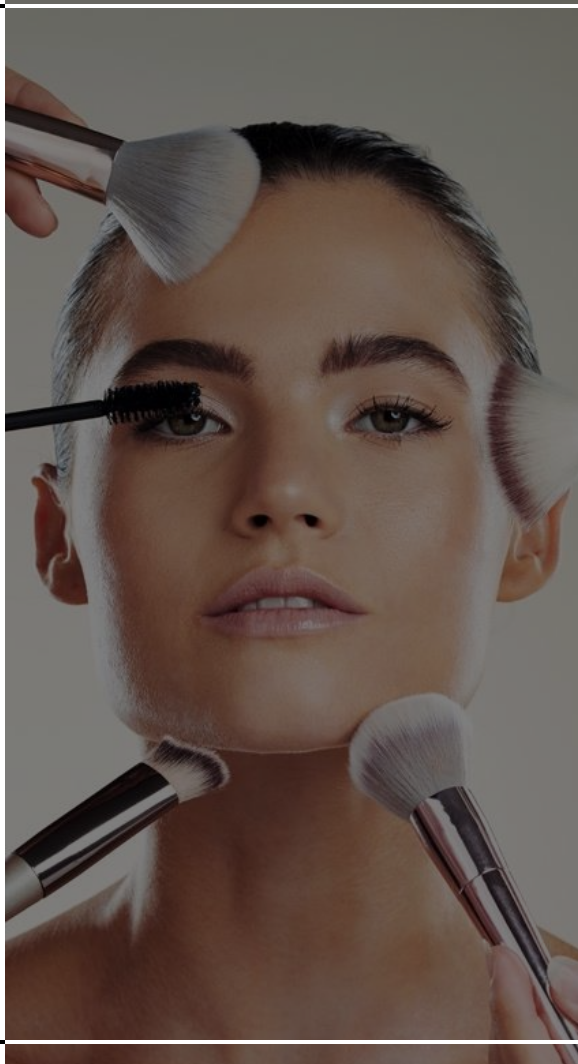


GOALS AND CRITERIA FOR SUCCESS

DATA-DRIVEN PRODUCT SELECTION

Criteria for success:

Identification of 5-7 high
demand product types
with strong customer
engagement.



MOST SUITABLE PRICING STRATEGY

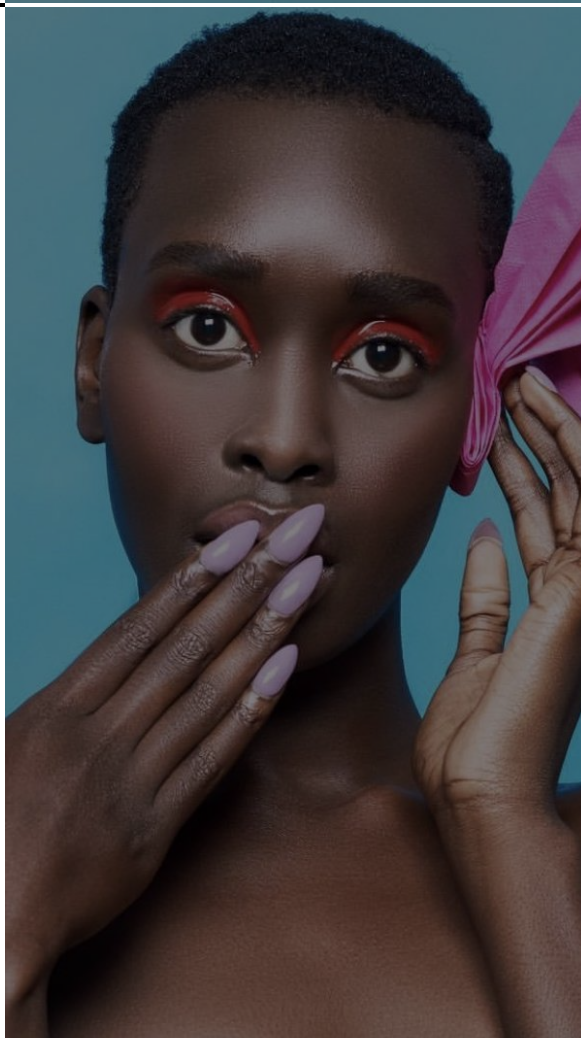
Criteria for success:

Defining the price ranges
and finding the optimal
price between quality and
affordability.

MAXIMIZE CUSTOMER ENGAGEMENT

Criteria for success:

Identification of
engagement-boosting
features.



ACTIONABLE RECOMMENDATIONS

Criteria for success:

Provide data-supported
strategies for the potential
products launch.



RECOMMENDATIONS AND FINDINGS

MAKEUP AND SKINCARE WOULD BE THE MOST SUITABLE CATEGORIES

- Lip products such as gloss or tints
- Hydrating and anti-aging products
- Include trending ingredients such as anti-aging, hydration and vegan



MOST SUITABLE PRICING IS IN THE MIDDLE RANGE

The best price range for makeup is anywhere between \$15 and \$57. For skincare, \$25 to \$100 would be among the most acceptable pricing

MAXIMIZE CUSTOMER ENGAGEMENT

- Digital Marketing:
Celebrities/influencer
endorsement
- Use social Media Platforms to
showcase the products
- Use data to analyze customer
preference, engagement to
make product adjustments



CREATE BRAND IDENTITY AND PARTNERSHIP

- Create a Brand identity
such as being a clean
beauty brand
- Partner with online beauty
retailer such as Sephora

DIFFICULTIES

- Data limitation
- Engagement metrics may not translate well
- Consumer behavior changes
- No direct sales data



SUMMARY OF PROJECT

HYPOTHESIS

Mid-priced personal care products receive a higher volume of reviews compared to premium or budget-priced alternatives, driven by a perceived balance between affordability and quality.



DATASET

Cosmetics and skincare products with over 1 million reviews from customers

GOALS

- Data-driven product selection
- Most suitable pricing strategy
- Maximize customer engagement
- Actionable recommendations

