



# Recommender System

## June 2020





*hello!*

# I am Grace Valmadrid

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# 1. Skincare Ingredients Guide The dataset

*Products and reviews were scraped from  
Sephora.com and Bazaarvoice's API*

RETINOL ▶  
for wrinkles



HYALURONIC ACID ▶  
for dryness



COLLAGEN ▶  
for loss of firmness



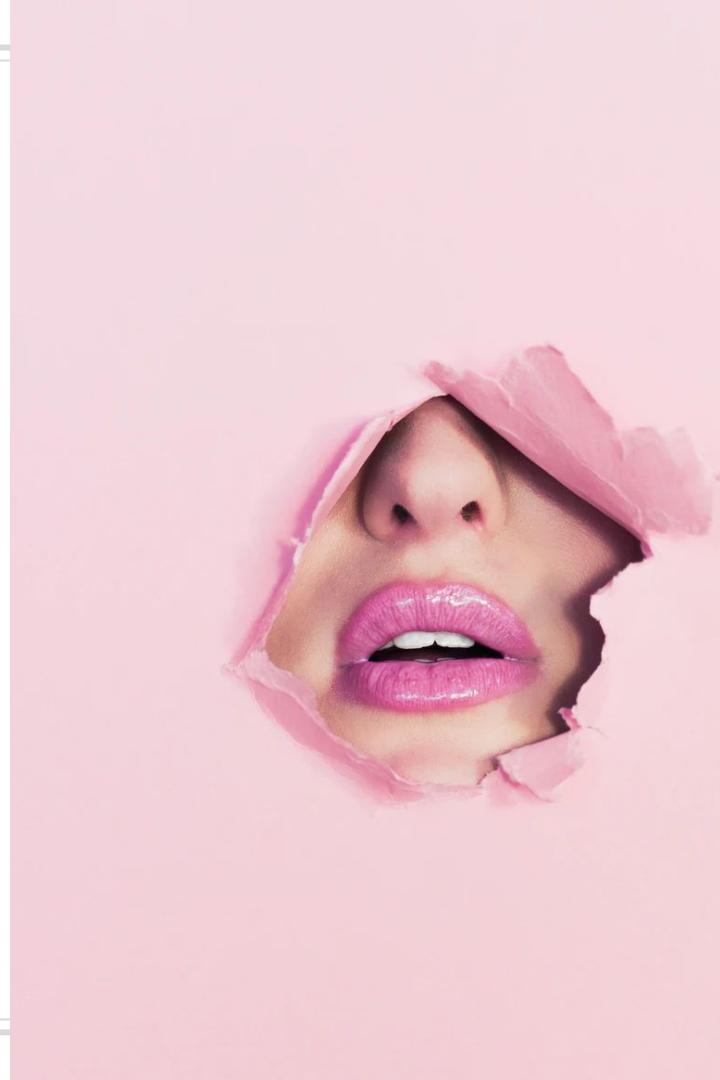
# 9K+ products

That's a lot of options...

# 1M+ users

# ~3M reviews

*Active users and reviews in the past 5 years.*



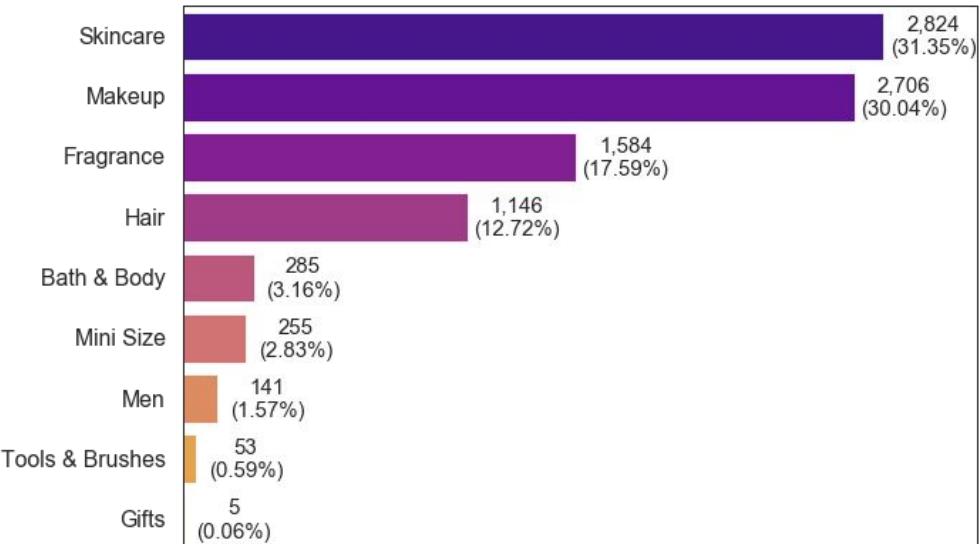


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# It's all about SKINCARE *and* MAKEUP



## Main Categories:



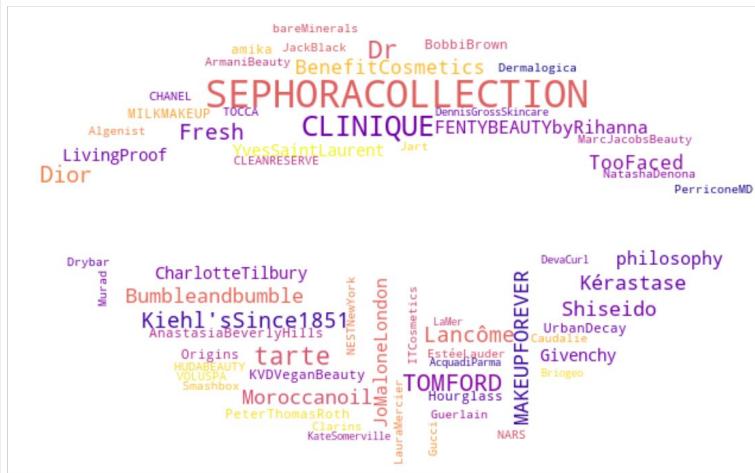
Total no. of Product (#, %)

As of June 2020

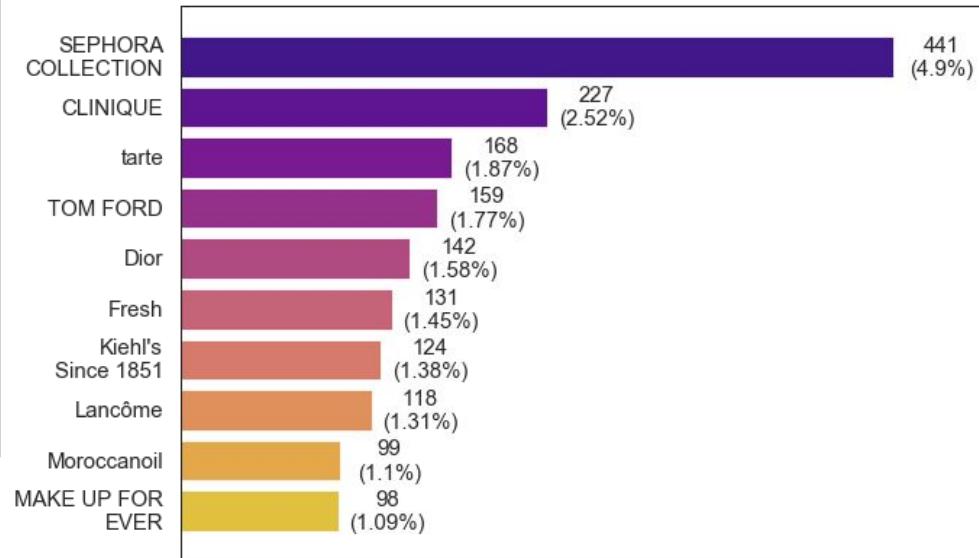




# 320 brands to choose from



## Brands with most number of products:



Total no. of Product (#, %)

As of June 2020

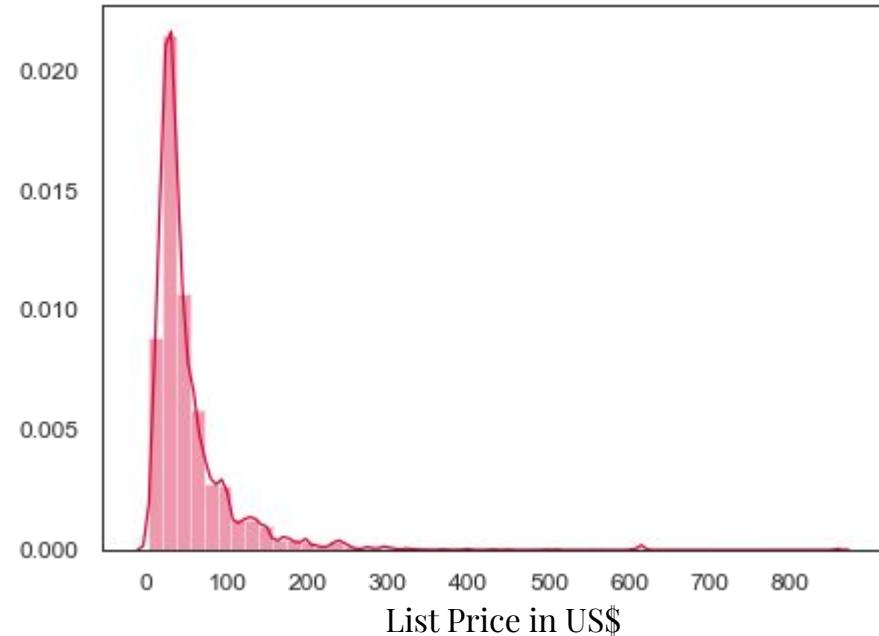




# Retail price ranges from \$2 - \$860

## 10 Most Expensive Products:

Dyson	Airwrap™ Styler	\$ 549
Dyson	Corrale™ Hair Straightener	499
Perricone MD	Neuropeptide Smoothing Facial Conformer	495
Guerlain	Orchidee Imperiale Anti-Aging Cream	480
Tata Harper	Elixir Vitae Serum Wrinkle Solution	450
Dr. Dennis Gross Skincare	SpectraLite™ Faceware Pro	435
NuFACE	Trinity + Eye and Lip Enhancer Attachment Bundle	429
NuFACE	Trinity Facial Toning Device + Wrinkle Reducer Attachment Bundle	429
NuFACE	NuBODY Skin Toning Device	399
Dyson	Supersonic Hair Dryer	399
Dyson	Supersonic™ Hair Dryer Gift Edition with Red Case	399



As of June 2020





# More than 75% of the products have average rating of at least 3.0

## Highest/Most Rated Products:

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COLLECTION

Gift Card



Aether Beauty Radiant Ruby Lip Crème



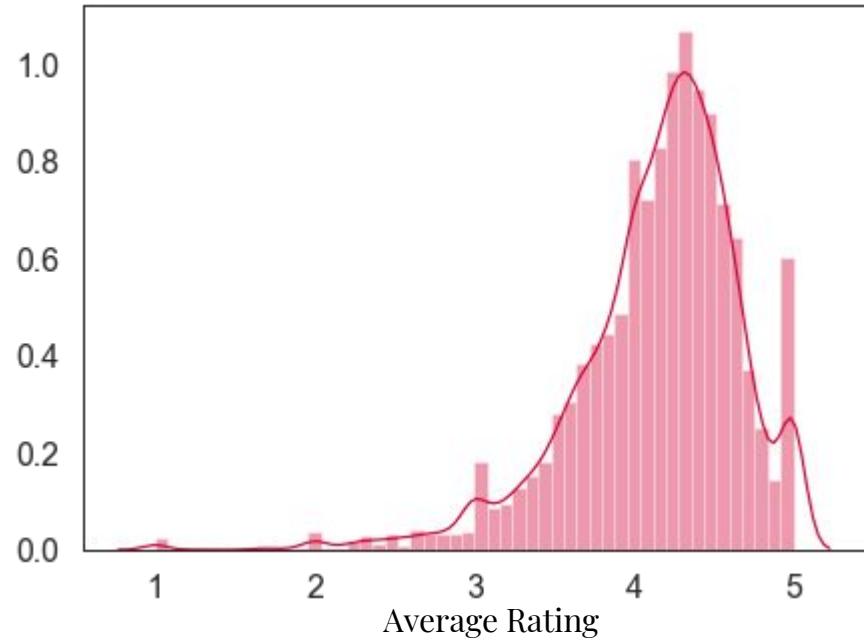
Jack Black Beard Wash



Givenchy Gentlemen Only Absolute



MAKE UP FOR EVER 210 Small Round Shader Brush



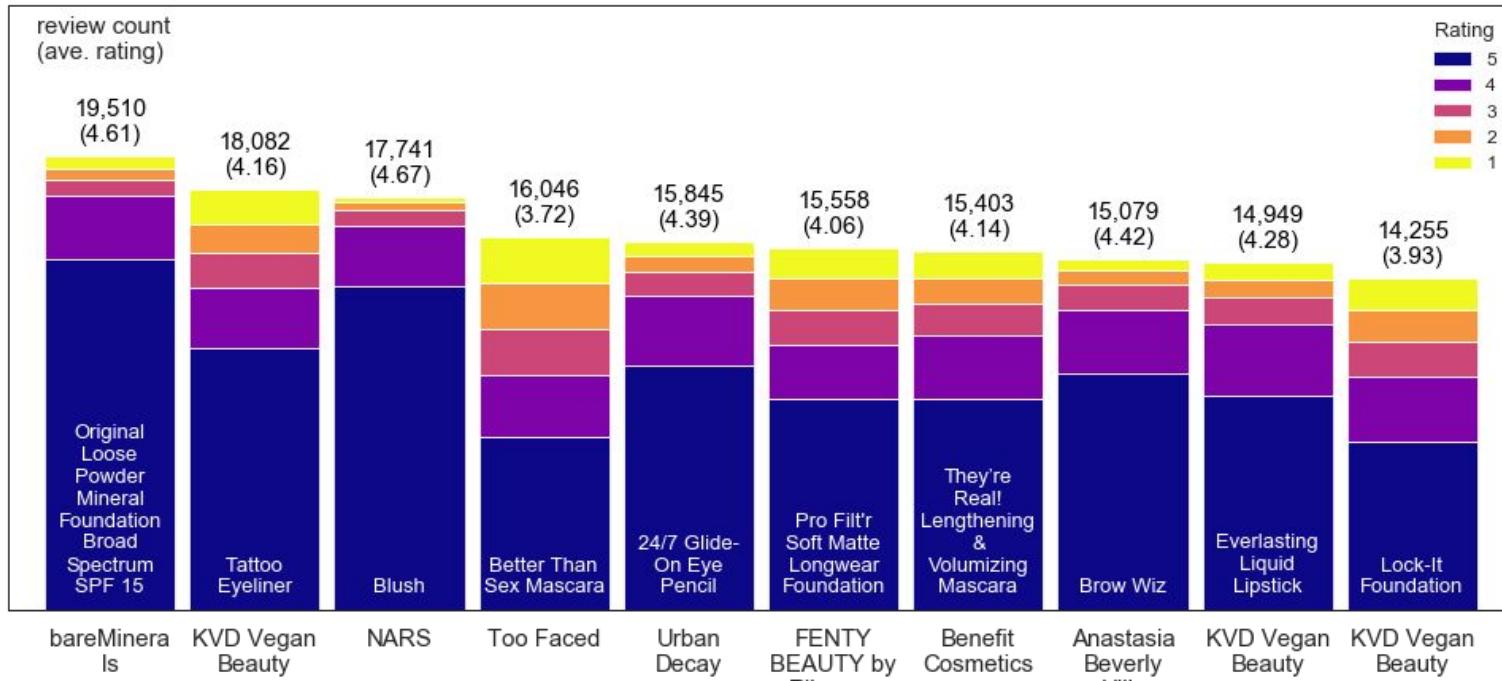
As of June 2020





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# Most reviewed products



As of June 2020

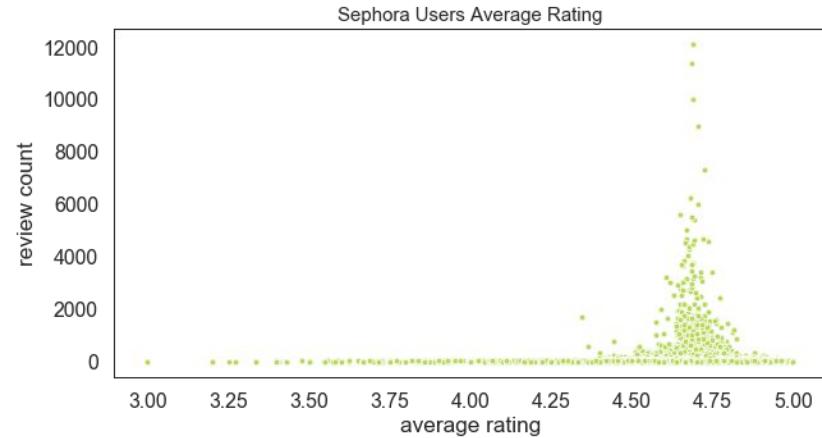
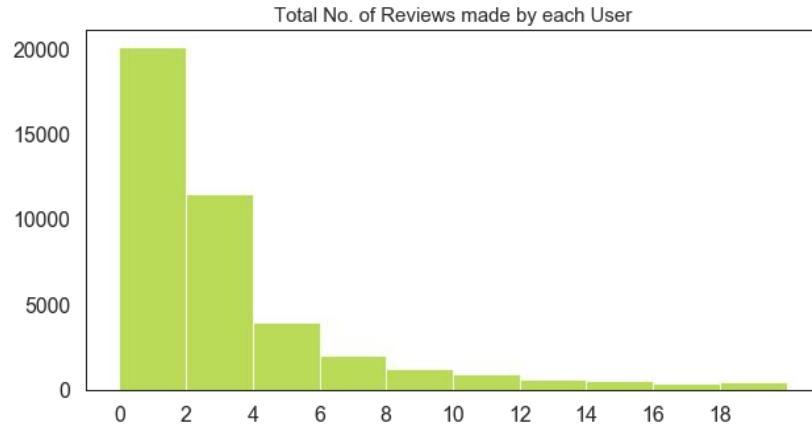


# 2. Recommender System





# Let's look at the reviews per user

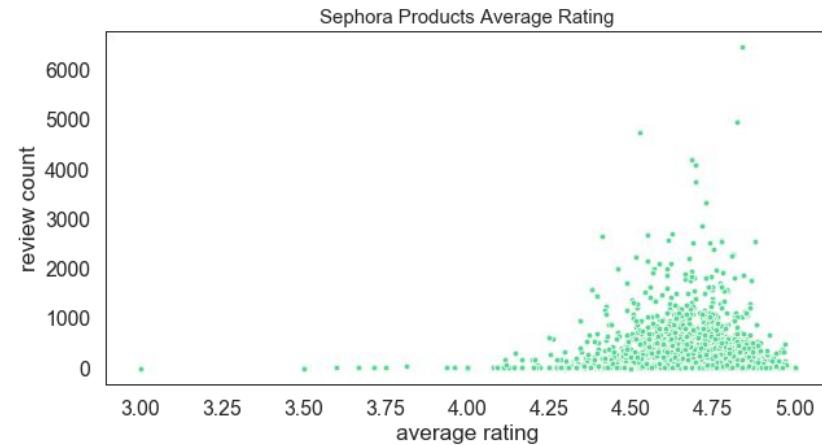
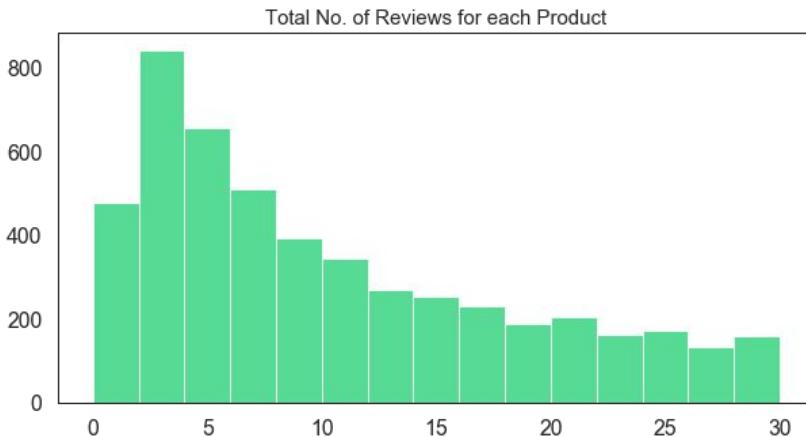


As of June 2020. Includes reviews in the past 5 years with rating and helpfulness score of at least 3 and 0.5, respectively and where the user recommended the product.





# ... and reviews per product



As of June 2020. Includes reviews in the past 5 years with rating and helpfulness score of at least 3 and 0.5, respectively and where the user recommended the product.



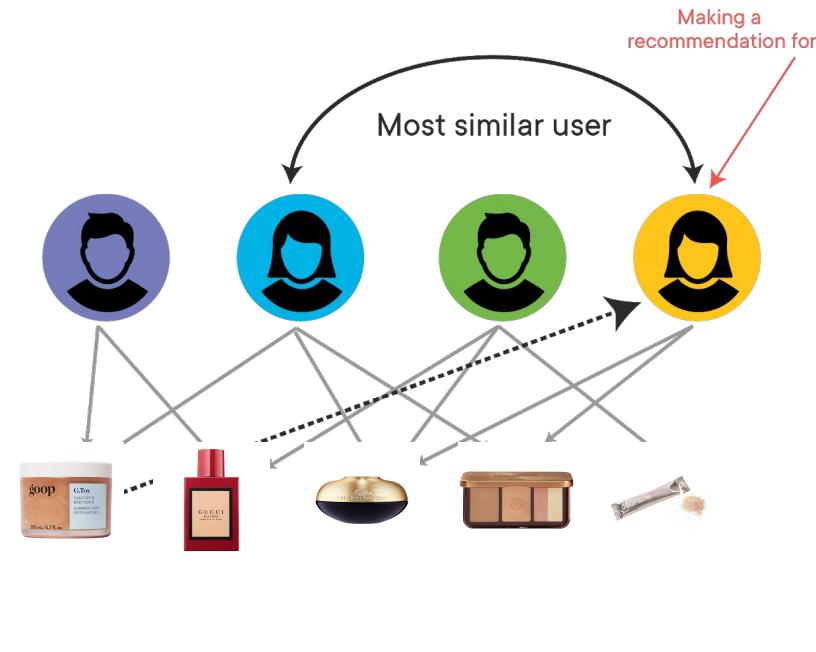


# Collaborative Filtering

Item-Based Collaborative Filtering



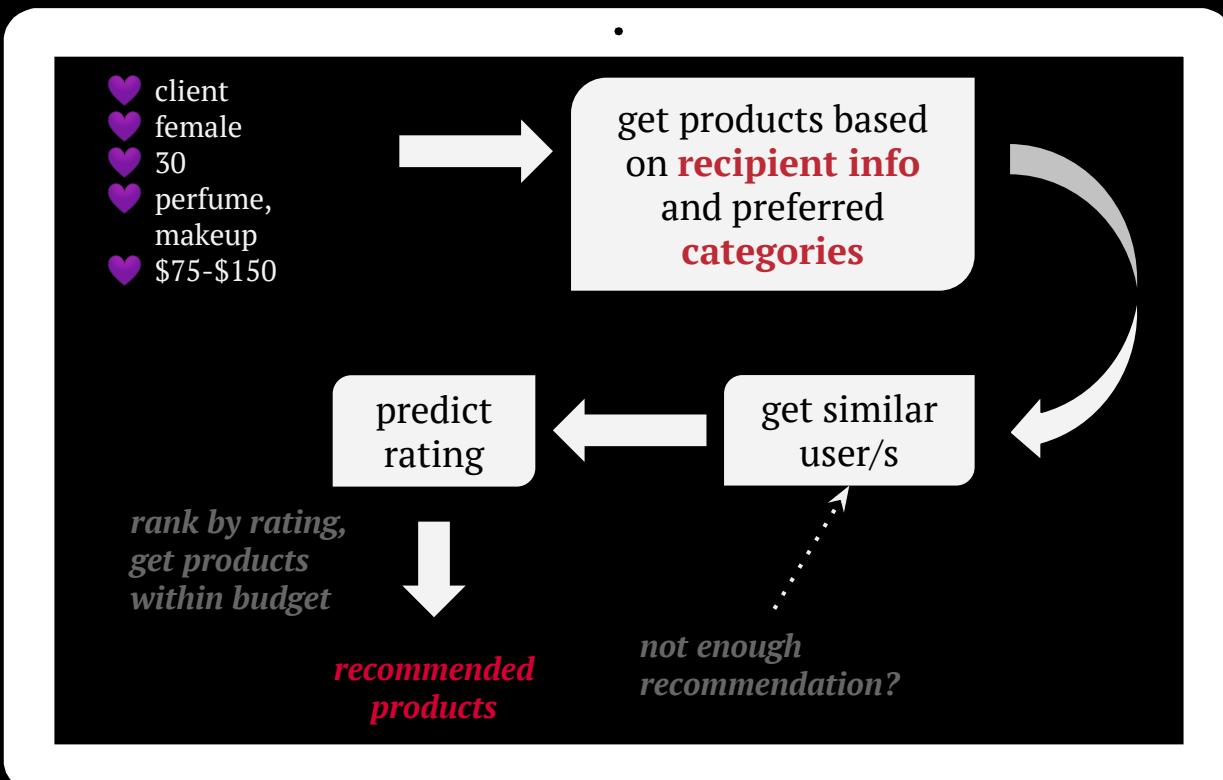
User-Based Collaborative Filtering



## Model 1 : KNNBaseline

Inputs from **Gifter**:

- ? Recipient
  - Relationship
  - Gender
  - Age
- ? Category/ies to provide recommendation from
- ? Budget range



<b>Product ID</b>	<b>Product Name</b>		<b>Brand Name</b>	<b>Min Price (\$)</b>	<b>Max Price (\$)</b>	<b>Rating Estimate</b>
P400556	Silky Satin Lip Colour		Christian Louboutin	90	90	5.000
P382515	Pour Femme Intense		DOLCE&GABBANA	99	123	5.000
P379990	Beautiful		Estée Lauder	85	85	5.000
P433900	DAHLIA DIVIN Eau Initiale		Givenchy	78	78	5.000
P435344	Magic Discovery Set		Viktor&Rolf	135	135	5.000
P451632	Hydrating Complexion Essentials		FENTY BEAUTY by Rihanna	81	81	5.000
P435858	Bronzer Brush 05		TOM FORD	115	115	5.000
P455423	Burberry Her Eau de Parfum Gift Set		BURBERRY	136	136	5.000
P455262	CHANCE Crayons de Parfum		CHANEL	80	80	4.9990
P423186	Chloé Absolu de Parfum		Chloé	115	145	4.9970
P227402	COCO MADEMOISELLE Eau de Parfum Twist and Spray		CHANEL	110	110	4.9970
P122345	for her Eau de Parfum		Narciso Rodriguez	100	100	4.9952
P458277	Mini Superstar Wardrobe Makeup Value Set		Benefit Cosmetics	90	90	4.9947
P168940	Juicy Couture		Juicy Couture	76	96	4.9945
P9549	ALLURE Eau de Parfum		CHANEL	105	105	4.9921

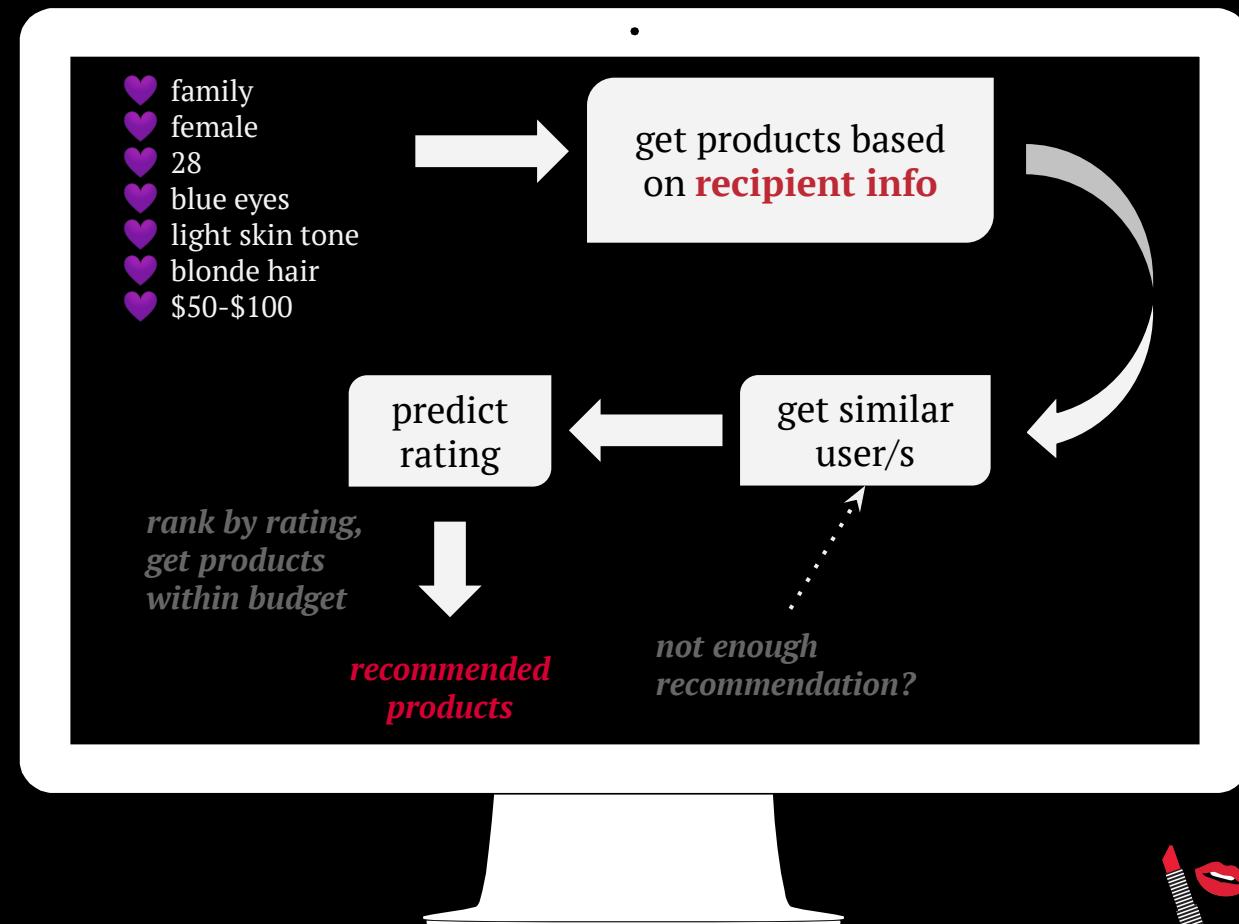
### Top 15 recommendations

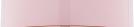
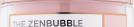
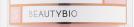


## Model 2: KNNBaseline

Inputs from **Gifter**:

- ? Recipient
  - Relationship
  - Gender
  - Age
  - Eye color
  - Skin tone, condition & concerns
  - Hair color, condition & concerns
- ? Budget range



<b>Product ID</b>	<b>Product Name</b>		<b>Brand Name</b>	<b>Min Price (\$)</b>	<b>Max Price (\$)</b>	<b>Rating Estimate</b>
P459127	Platinum Lip Plump SPF 30		Dr. Lara Devgan Scientific Beauty	50	50	4.9590
P444401	Solstice Eyeshadow Palette		Aether Beauty	58	58	4.9438
P438628	Contouring + De-Puffing Rose Quartz Roller		BeautyBio	60	60	4.9415
P433886	Squalane + Glycolic Renewal Mask		Biossance	68	68	4.9318
P440063	Complexion Perfecting Hydrator		Proactiv	60	60	4.9310
P440981	Age Adapting CBD Serum		Flora + Bast	77	77	4.9304
P440067	Advanced Dark Spot Correcting Serum		Proactiv	50	50	4.9234
P403315	Gold Camellia Beauty Oil		Tatcha	95	95	4.9175
P430239	Veil™ Powder Brush		Hourglass	64	64	4.9134
P441868	Skin Dope Argan Oil + 100 mg CBD		Josie Maran	78	78	4.9121
P451749	Bio Hyaluronic Moisturizing Cream		SOBEL SKIN Rx	75	75	4.9118
P428642	No. 3 Exotic Goddess Ageless Serum		Edible Beauty	57	57	4.9090
P458537	Joshua Tree Desert Matte Eyeshadow Palette		Aether Beauty	58	58	4.9053
P455623	The ZenBubble Gel Cream		BeautyBio	65	65	4.9052
P430950	SLEEP Inner Beauty Powder		The Beauty Chef	60	60	4.9007

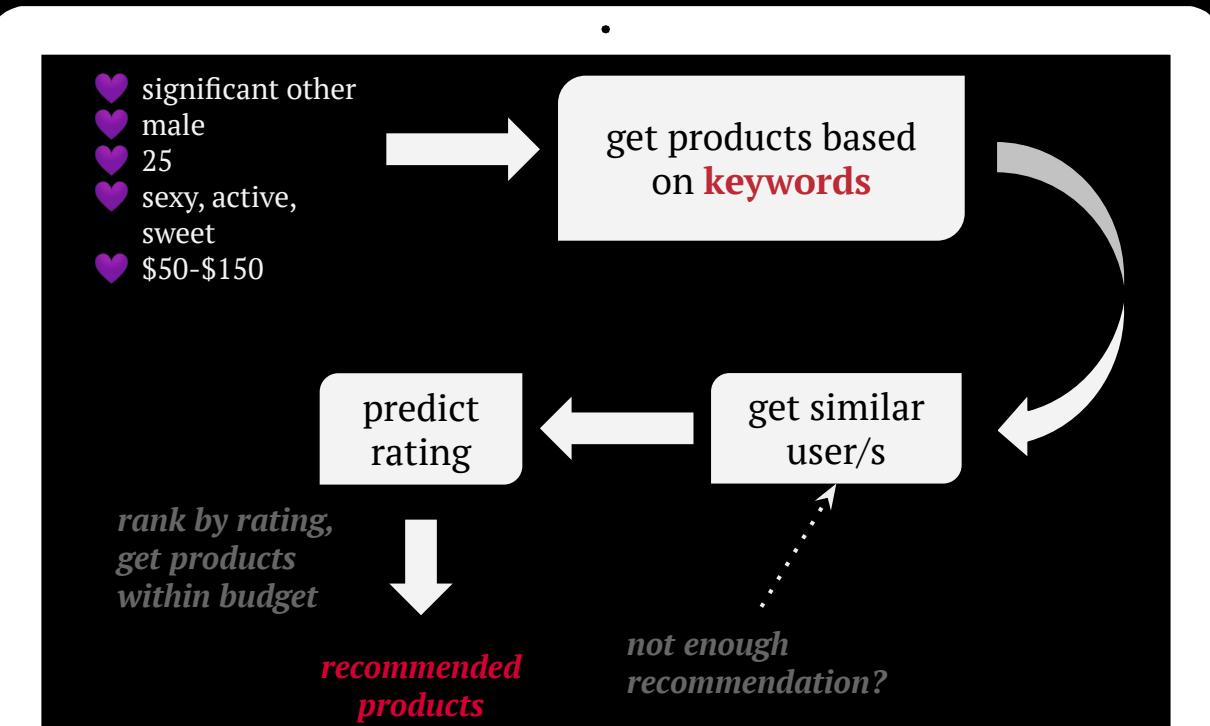
### Top 15 recommendations



## Model 3: SVD

Inputs from **Gifter**:

- ? Recipient
  - Relationship
  - Gender
  - Age
  - 3 words to describe
- ? Budget range



<b>Product ID</b>	<b>Product Name</b>	<b>Brand Name</b>	<b>Min Price (\$)</b>	<b>Max Price (\$)</b>	<b>Rating Estimate</b>
P405501	Spicebomb Extreme	Viktor&Rolf	120	120	4.8038
P443381	Sun-Kissed Body Glow Oil	KORA Organics	58	58	4.7976
P224300	The One For Men	DOLCE&GABBANA	70	120	4.7970
P12539	ALLURE HOMME Eau de Toilette	CHANEL	75	97	4.7876
P418122	Dior Homme Sport	Dior	79	140	4.7418
P427421	Protini™ Polypeptide Moisturizer	Drunk Elephant	68	68	4.7402
P4440	212 Men	Carolina Herrera	72	92	4.7230
P443404	Armani Code Absolu Pour Homme	Armani Beauty	95	117	4.7161
P406330	The One For Men Eau De Parfum	DOLCE&GABBANA	78	134	4.7109
P397673	Dior Homme Cologne	Dior	79	99	4.7104
P444118	Light Blue Sun Pour Homme Eau de Toilette	DOLCE&GABBANA	68	68	4.6928
P429958	Milk + Cake Duo	Reverie	91	91	4.6911
P421783	EMPORIO ARMANI Stronger With You	Armani Beauty	89	89	4.6751
P449768	Relaxing Scrub: Soothing Scrub for Dry Scalp	Kérastase	50	50	4.6476
P398753	CAKE Restorative Scalp Tonic	Reverie	72	72	4.6428

**Top 15 recommendations**





# Model Evaluation

Algorithm	Test RMSE
K-Nearest Neighbors Baseline	0.4944
Single Value Decomposition	0.5235
K-Nearest Neighbors Basic	0.5358

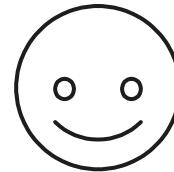




# How can we improve the models?

- ✓ Employ sentiment analysis on product reviews and description
- ✓ Expand coverage
  - use reviews in the past 10 years
- ✓ Categorise the products correctly
- ✓ Use other algorithms





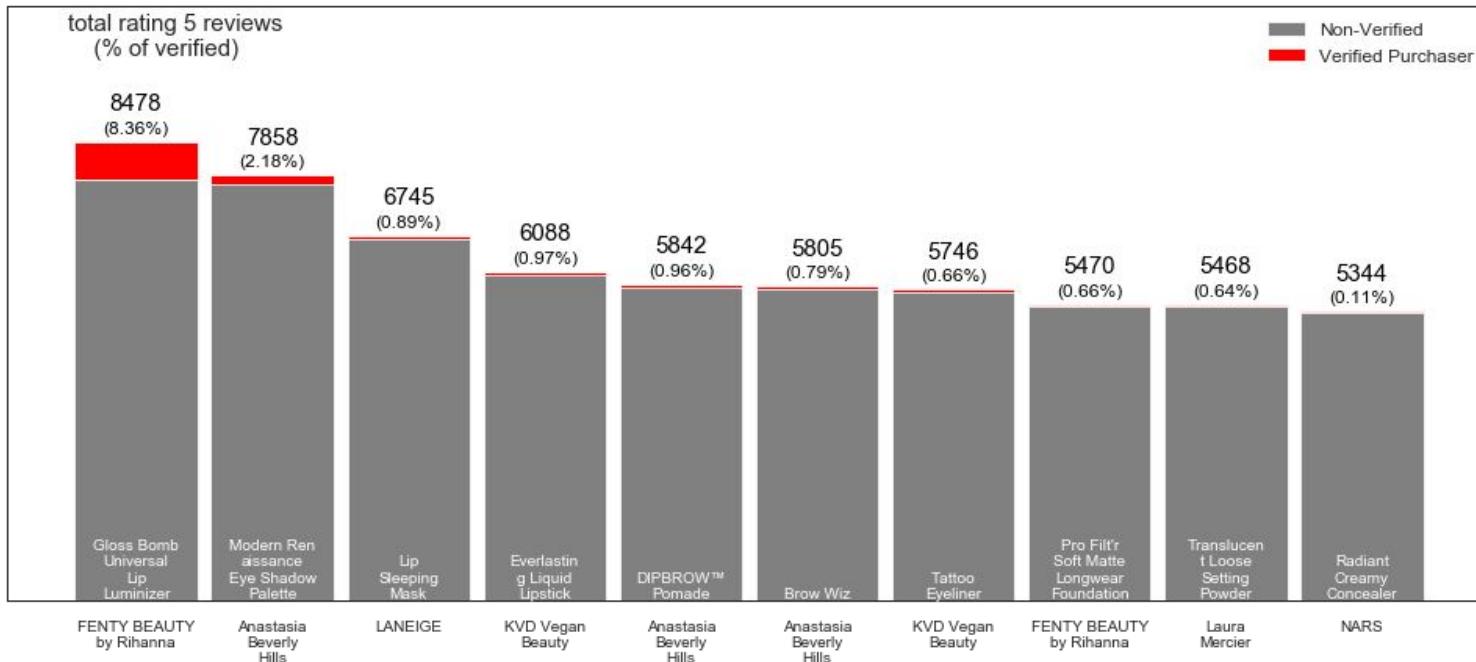
*thanks!*

Any questions?





# Ratings from verified purchasers



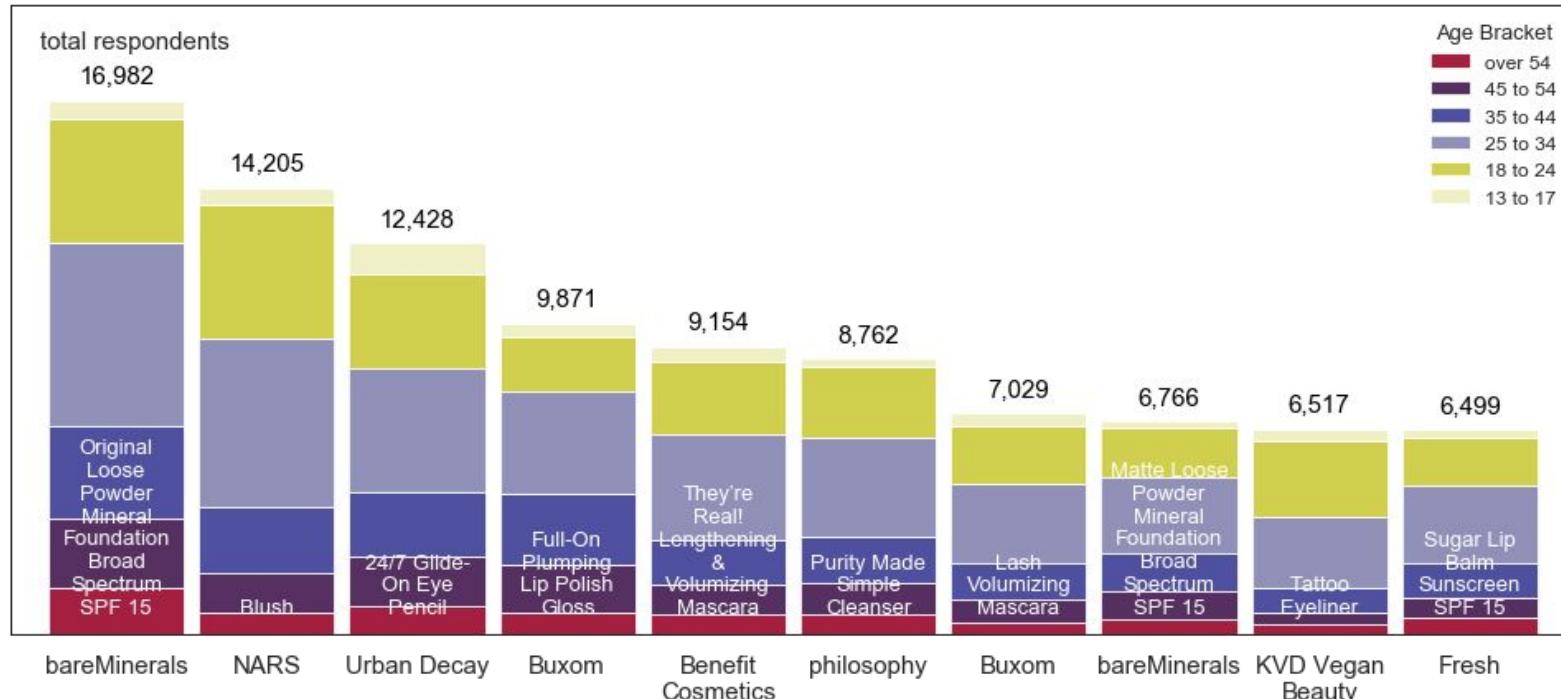
As of June 2020





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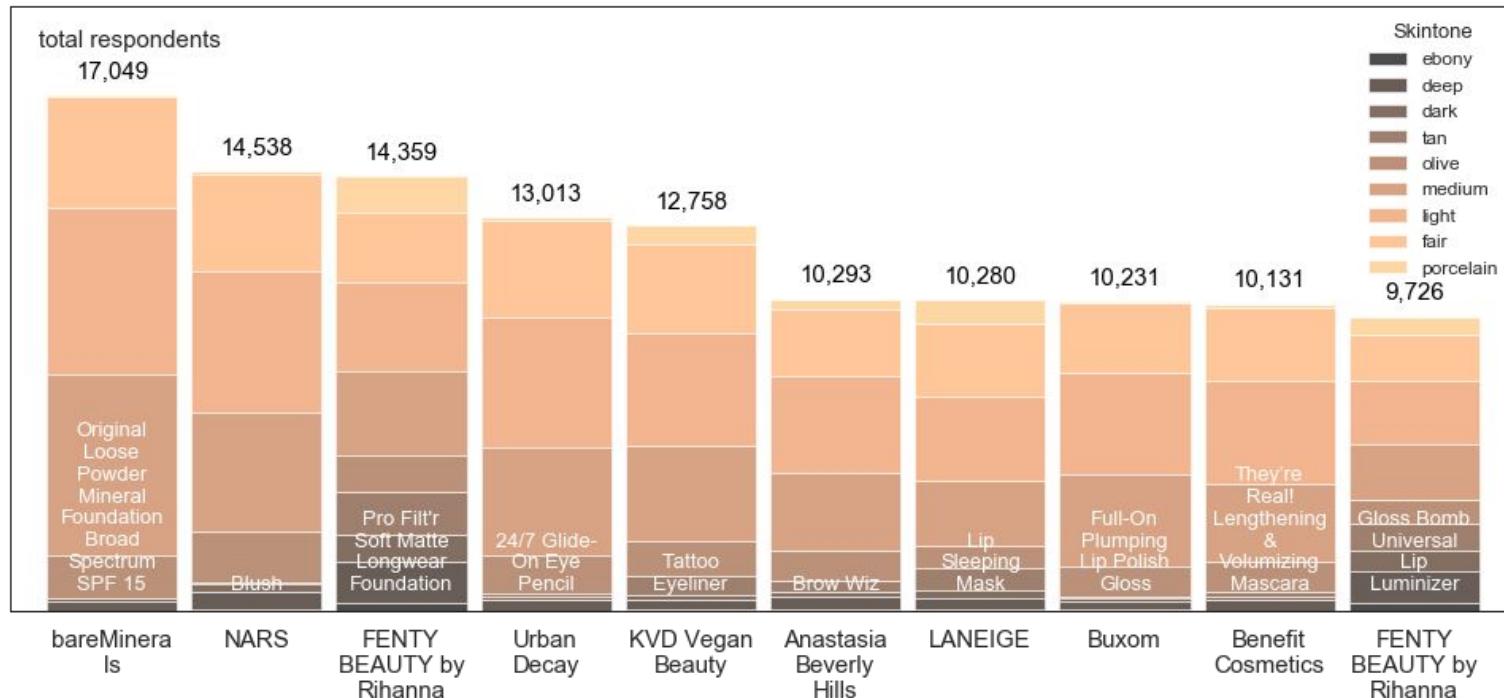
# Most reviewed products: Age bracket





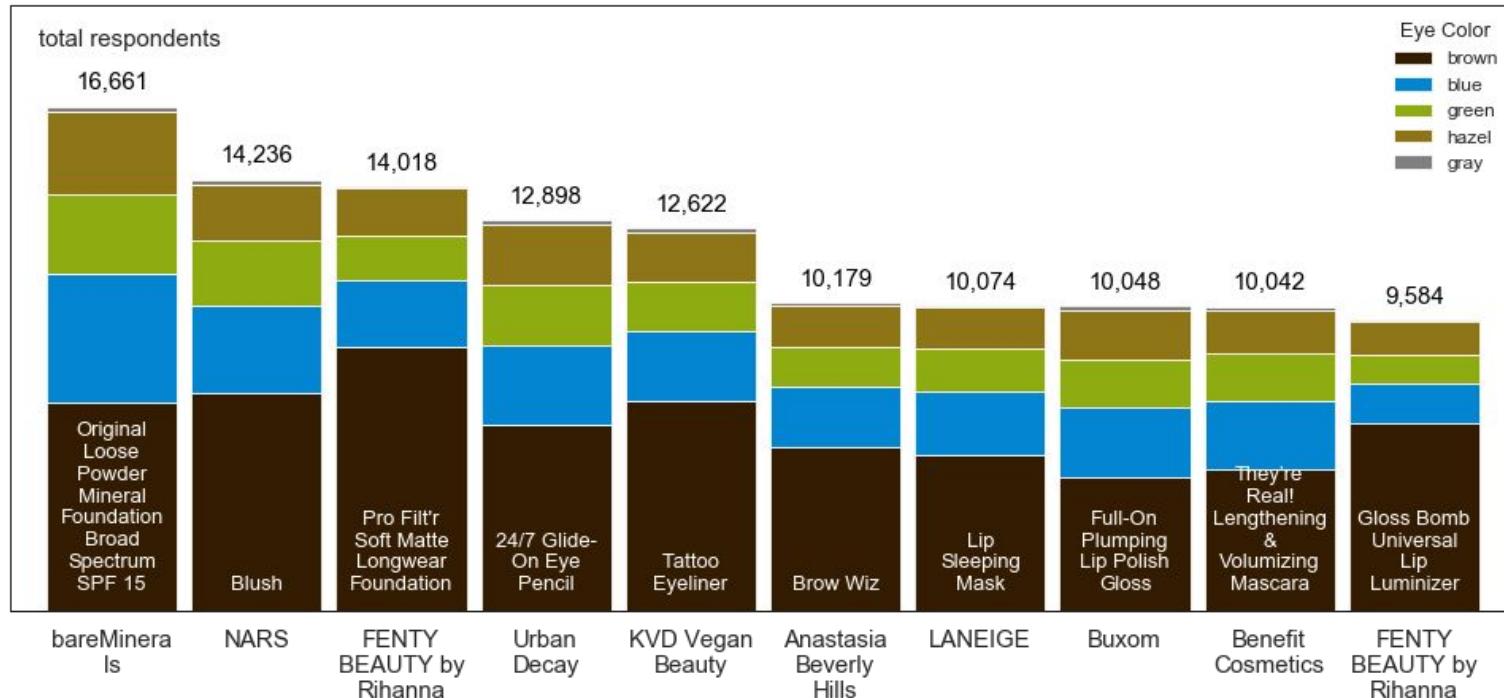
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# Most reviewed products: Skintone



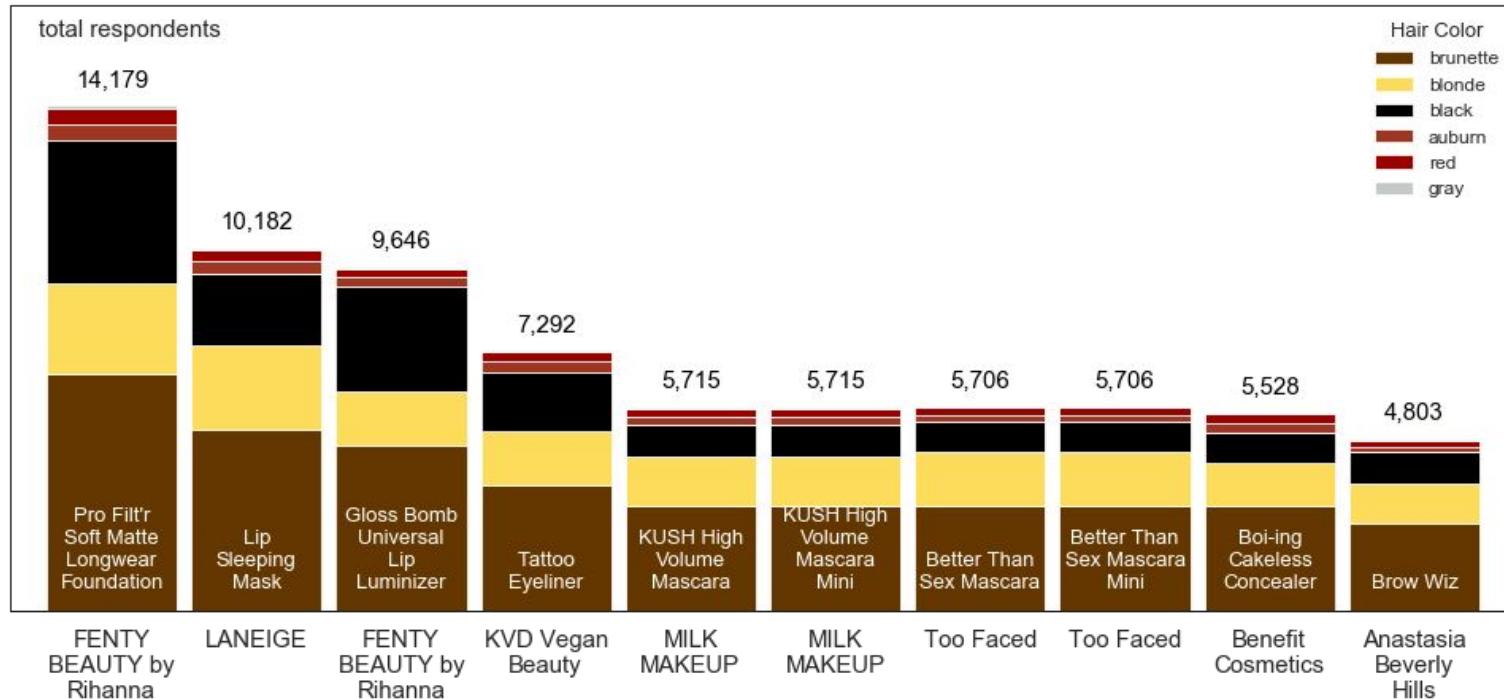


# Most reviewed products: Eye color





# Most reviewed products: Hair color





# Credits

- ♥ [Sephora.com](#)
- ♥ [Bazaarvoice](#)
- ♥ [SlidesCarnival](#)
- ♥ [Unsplash](#)

