

A top-down view of various natural skincare products and botanicals arranged on a white, weathered wooden surface. The products include a clear glass bottle with a white pump dispenser containing a yellow liquid, a small amber glass bottle with a black cap containing an orange liquid, a small glass jar with a green lid containing a green granular substance, a small glass jar with a silver lid containing a light green cream, a small white jar with a white lid containing a white cream, and a small white jar with a light green lid containing a light green cream. The botanicals include several green leaves, some with white variegation, and several green fern fronds. The text "Skincare Products Recommendations" is overlaid in the center in a large, bold, black font.

Skincare Products Recommendations

Final project by Anastasia Gorina

Overview

- Since **Sephora** doesn't have a **recommendation system** at the moment, I have decided to build one (or three).
- All data was scraped from **Sephora.com**: 17,000 **user reviews** for 1,400 unique **skincare products**
- Ended up with three models: filtering based on **user features**, **content-based** recommender, and **collaborative filtering**.

Pit stop for fun (review generator with Markov chain):

“AMAZING I originally purchased the Balance and Clarify set which contained a 2 step peel and I broke out”

“The only thing it seemed to work because I’m self conscious of the work getting rid of it”

“It smells like bad BO and I love the gel cream”

“If your eyes it remove makeup i love it but the more expensive items in my midlate 20s normal skin”

EDA: Can we predict if a product gets 5-stars?

Not really...

	accuracy	0.5991678224687933			
		precision	recall	f1-score	support
	1	0.49	0.26	0.34	856
	0	0.63	0.82	0.71	1307
	micro avg	0.60	0.60	0.60	2163
	macro avg	0.56	0.54	0.53	2163
	weighted avg	0.57	0.60	0.56	2163

Model #1: By user Features

Skin Tone
Medium

Skin Type
Combination

Eye color
Green

Hair color
Blonde

Based on your features, these are the top products for you:

Rating	Product
5	Waterproof Eye Makeup Remover
5	Toning Lotion with Camomile
5	Double Serum Complete Age Control Concentrate
5	Acne Healing Dots
5	Fresh Pressed Renewing Powder Cleanser with Pure Vitamin C

- Good for cold start problem: a user just needs to look in the mirror
- It takes user features, and gives top rated products from the customers who look like the person who is providing input

Model #2: By similarity of the ingredients

Skincare recommendations based on your favorites

Your favorite product!

Beauty Elixir

Based on your preference, these are the top products for you:

Rating	Product
Vine[activ]	caprylic, capric, triglyceride, vitis, vinifera, grape, seed, oil, prunus, amygdalus, dulcis, sweet, almond, oil, rosa, canina, fruit, oil, citrus, aurantium, amara, bitter, orange, leaf, twig, oil,
Overnight	daucus, carota, sativa, carrot, seed, oil, santalum, album, sandalwood, oil, helianthus, annuus, sunflower, seed, oil, citrus, aurantium, amara, bitter, orange, flower, oil, lavandula,
Detox Oil	angustifolia, lavender, oil, rosmarinus, officinalis, rosemary, leaf, extract, citral, limonene, geraniol, linalool, farnesol
Resveratrol Lift	glycerin, butylene, glycol, isononyl, isononanoate, caprylic, capric, triglyceride, cetearyl, alcohol, hydrogenated, vegetable, oil, vitis, vinifera, grape, seed, oil, peg, stearate, squalane,
Night Infusion	citrus, aurantium, amara, bitter, orange, flower, butyrospermum, parkii, shea, butter, extract, carbomer, palmitoyl, grapevine, shoot, extract, parfum, fragrance, caprylyl, glycol,
Cream	potassium, sorbate, polyglyceryl, pentaoleate, palmitoyl, grape, seed, extract, xanthan, gum, tocopheryl, acetate, sodium, hydroxide, verbena, officinalis, extract, tilia, cordata, extract,
	ceramide, sodium, hyaluronate, acrylate, c, alkyl, acrylate, crosspolymer, sodium, carboxymethyl, beta, glucan, tocopherol, helianthus, annuus, sunflower, seed, oil, linalool, limonene,
	coumarin, butylphenyl, methylpropional, plant, origin

Good for opinionated and experienced users.

Tested on my favorite products, and it gives meaningful recommendations!

Model #3: By user similarity

Skincare recommendations to users (for business)

List of user ids

This user may like the following products:

- Rapid Collagen Infusion
- Glycolic Peel
- Transforming Walnut Scrub
- Therapeutic Sulfur Mask Acne Treatment Mask
- Benefiance NutriPerfect Night Cream
- Pure Skin® Clarifying Dietary Supplement
- Cleansing Spa Water Makeup Remover

Designed for business use. For example, customer service or marketing department representatives can type in a user id and email them a list of recommended products.

Future work

- Sell the app to Sephora for a million dollars
- Collaborate with **biochemistry experts, dermatologists,** and **geneticists** to collect more data about the users (e.g. skin **PH-level**, predisposition for **acne/photoageing**, etc.) and products, and use it to maximize the **personalized** approach to recommendations.