

What are successful skin care products?

Predicting pricing and popularity of skin care
products via linear regression

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Introduction

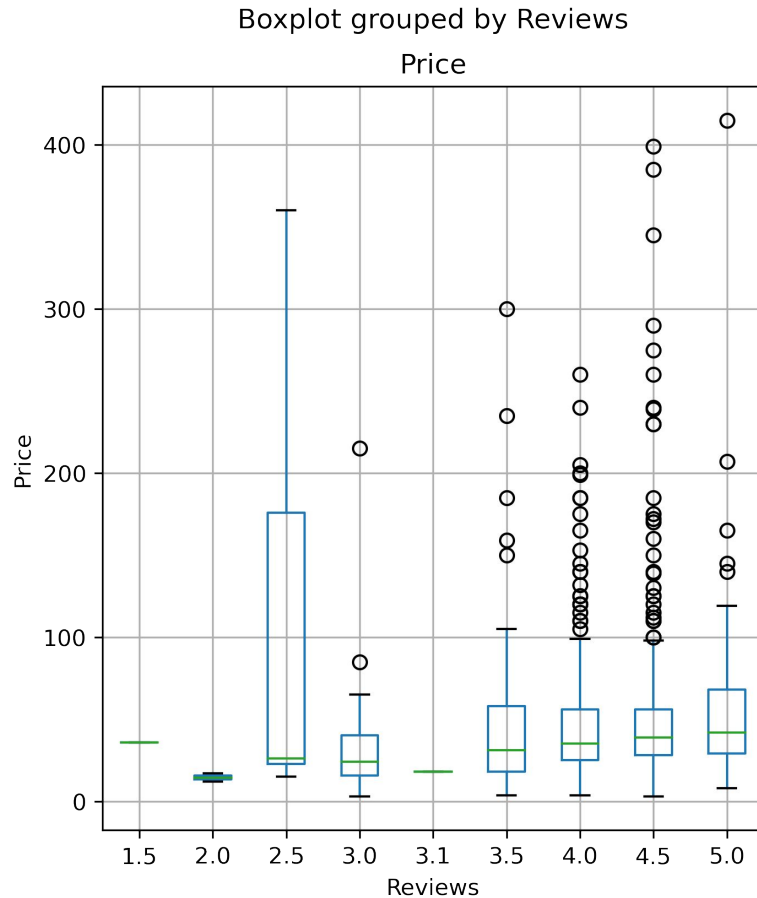
- How will skincare products rise based on several features?
- How will do skincare products fare in the current market and future market?
- Makeup is included within skincare products



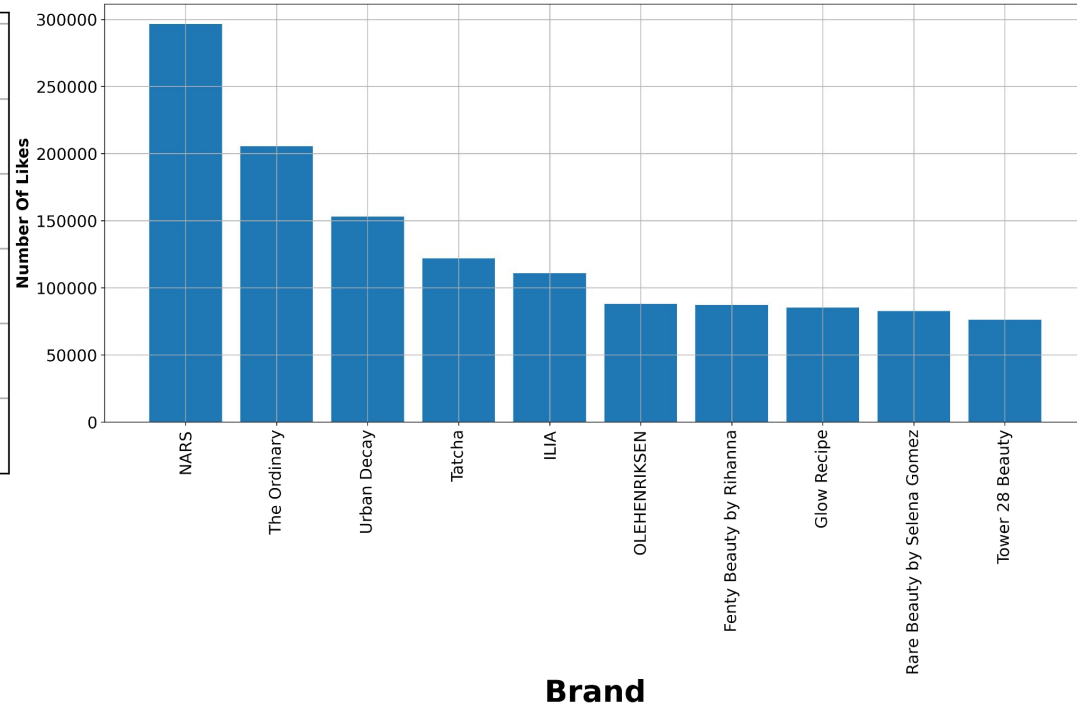
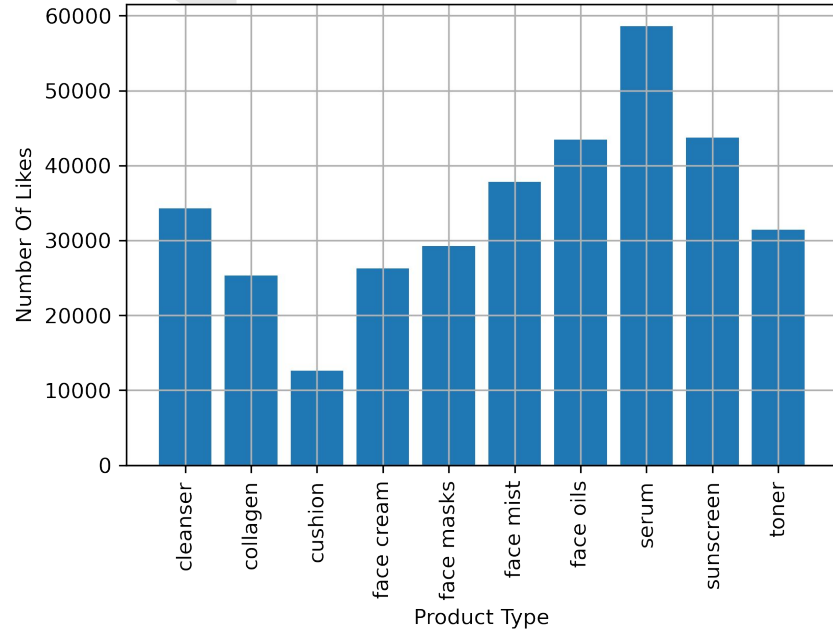
Methodology

- Data
 - Sephora skin care products data via web scraping with Selenium
 - 1000+ data points collected
- Tools:
 - Python, Pandas, Numpy,
 - Matplotlib, seaborn, BeautifulSoup
 - Selenium, Statsmodels, scikit-learn
- Features:
 - Continuous: Reviews, Number of Reviews, Number of Likes
 - Categorical: Skin type, ingredients, brand, products

Reviews vs Price

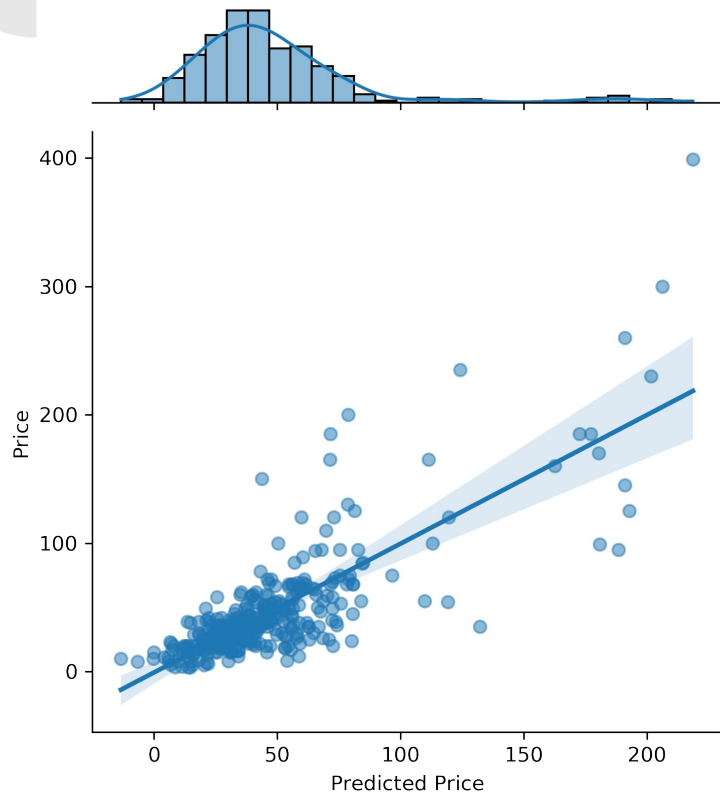


Number of Like against Brand and Product Type

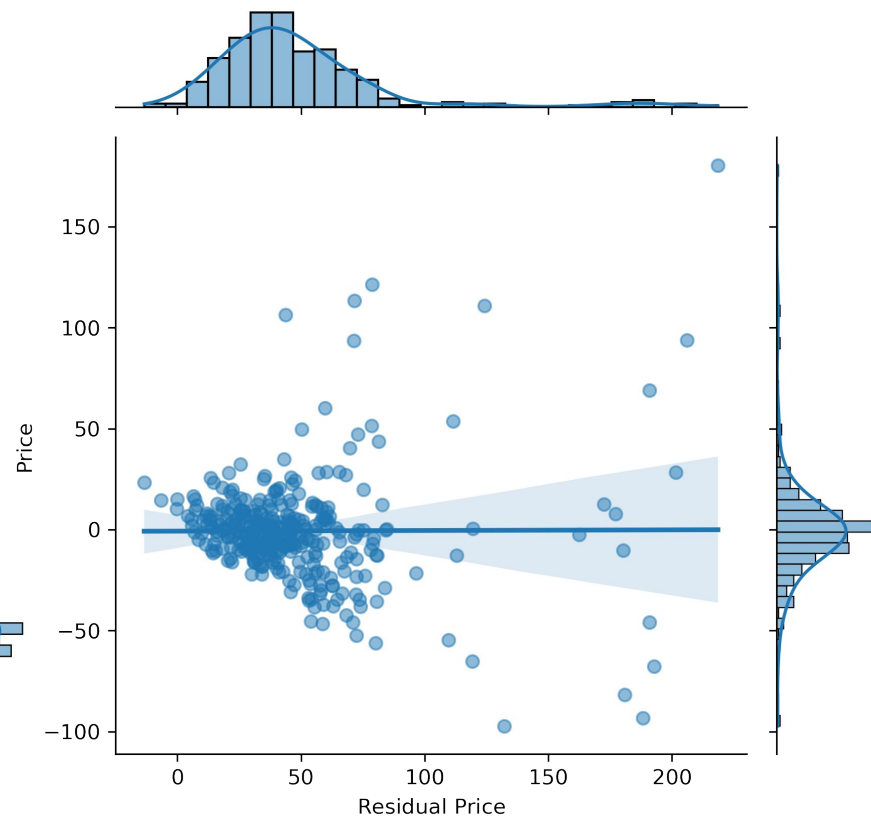


Lasso Regression

Observed Price vs Predicted Price



Residual Price vs Predicted Price

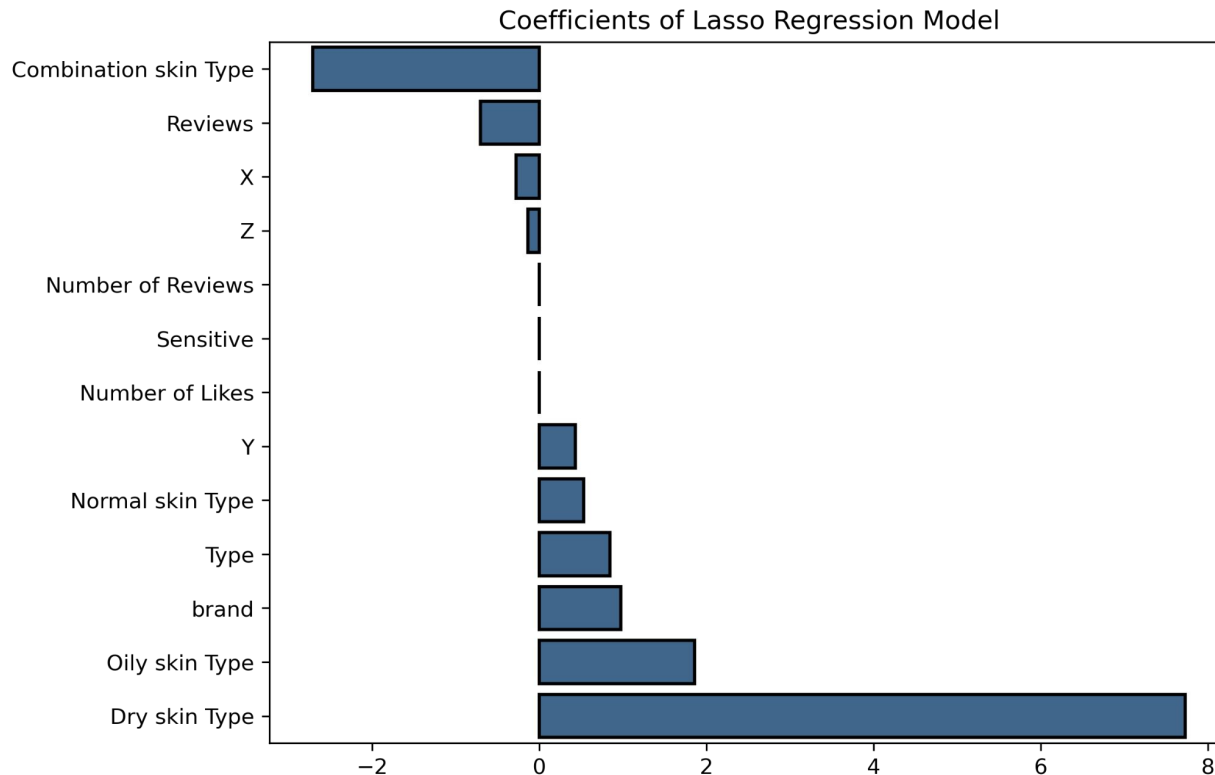




R² Values of Regression Models

Train/Validation/Test	R ²	Mean Absolute Error	Cross Validation/Test	R ²
Linear Regression	0.6362	16.3508	Linear Regression	0.6024
Ridge Regression	0.6362	16.3413	Ridge Regression	0.6030
Lasso Regularization	0.6363	16.3398	Lasso Regularization	0.6024
Polynomial Regression	0.6362	16.2660	Polynomial Regression	0.6020

Features Affecting Price





Conclusion

- Used Random Forest Regression because of Mean Absolute Error
- Price range of most skincare products: ~\$15.00 to ~\$100.00



Future Work

- Gathering skin care product information from other websites such as Ulta, OliveYoung, YesStyle, etc.
- Getting more numerical features and clinical data
- Comparison between top products, skincare vs makeup products
- Ordinal encoding of ingredients as well



Appendix

- 1000+ data points on skincare products:
 - Toner
 - Cleansers
 - Facial Cream
 - Facial Sheet masks
 - Sunscreen
 - Cushions
- Data cleaning: Products with no reviews will be considered as 5 stars so as not to assume they are bad products
- Reasons for selecting products:
 - Used in skincare steps
 - Skin suitability based on types: Normal, Oily, Combination, Sensitive
 - Makeup as a daily skincare product as well
- Ingredients:
 - Retinol, Ascorbic Acid, Niacinamide, Ceramide, Squalane, Hyaluronic Acid, Vitamin E, Titanium Dioxide, Glycolic Acid, Sodium Acetate, Sodium Benzoate, Sodium Hyaluronate, Panthenol

Thank you

