

BSAN 360: PROGRAMMING FOR DATA ANALYTICS
[HTTPS://GITHUB.COM/CTRUEONG2837/BSAN-FINAL-PROJECT](https://github.com/ctruong2837/BSAN-FINAL-PROJECT)

WHAT SKiNCARE PRODUCTS WORK BEST for different skin types?

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DATASET OVERVIEW

Dataset Description

- Dataset consists of online skincare product reviews from Sephora
 - Includes product ratings, prices, skin types, and recommendation indicators

Source

- Dataset
 - https://www.kaggle.com/datasets/nadyinky/sephora-products-and-skincare-reviews?select=reviews_1250-end.csv



DATASET SIZE & STRUCTURE

Size Information

- Original dataset: ~50,000 reviews
- Final cleaned dataset: 26,108 reviews
- 38 total variables after feature engineering

Key Variables Used

- Rating (1-5 stars)
- skin type (dry, oily, normal, combination)
- Product size (mini vs full)
- Price (USD and price tiers)
- Recommendation status



DESCRIPTiVE STATiSTiCS

- Average rating across all products: ~4.2 stars
- Majority of reviews are 4-5 stars
- Full-size products make up most reviews
- Price ranges from affordable to luxury skincare





RESEARCH QUESTION

- Do ratings differ by skin type?
- Does product price impact ratings?
- Does product size (mini vs full) affect ratings?
- Are higher-rated products more likely to be recommended?



NULL HYPOTHESES

- No difference in ratings across skin types
- No relationship between price and rating
- Product size does not impact rating
- Rating and recommendation are unrelated



SKIN TYPE VS RATING

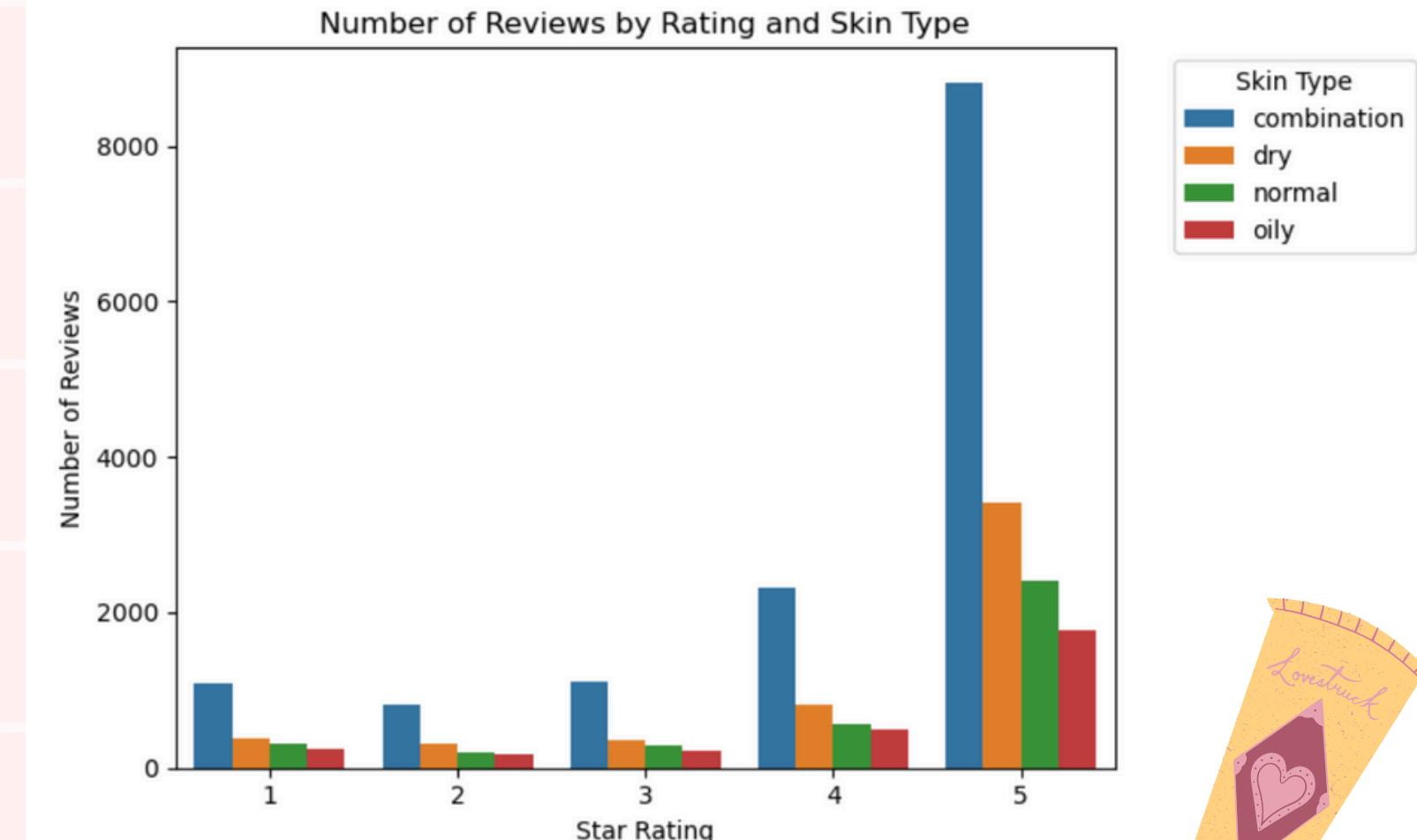
07

Findings

- Lower ratings (1-2 stars) exist, but they make up a much smaller share of reviews
- The overall rating distribution looks very similar across skin types
- Differences are more about review volume, not rating behavior

Conclusion

- Skin type does not meaningfully change how products are rated
- Most users, regardless of skin type, tend to rate products positively



PRICE VS RATING

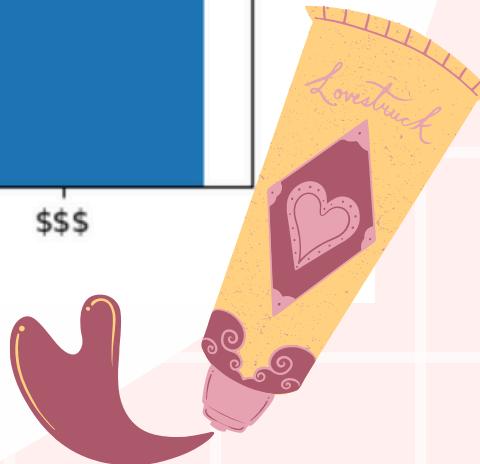
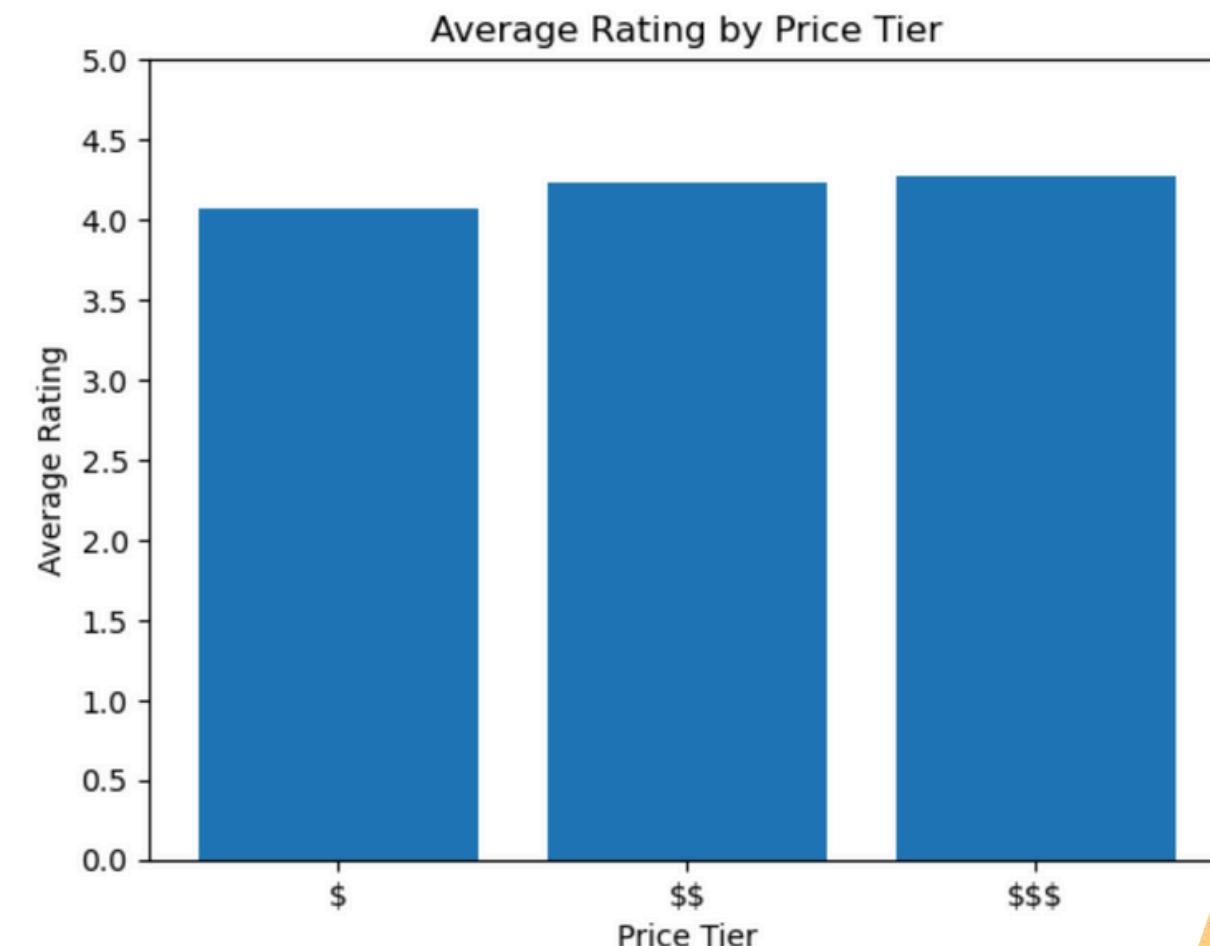
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Findings

- The difference between price tiers is small (about a few tenths of a star)
- Higher price does not lead to a dramatic increase in rating
- Ratings remain high across all price tiers

Conclusion

- Price has a weak relationship with product ratings
- Spending more does not guarantee a much better-rated product



PRODUCT SIZE VS RATING

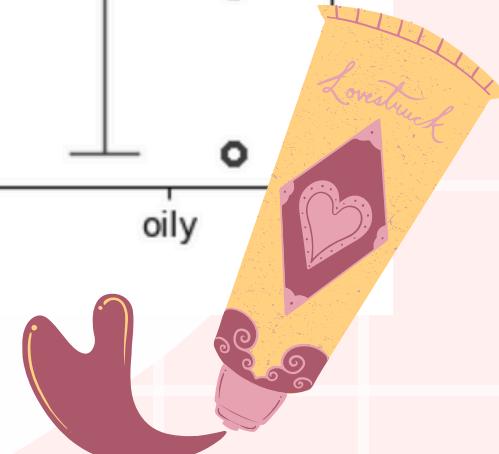
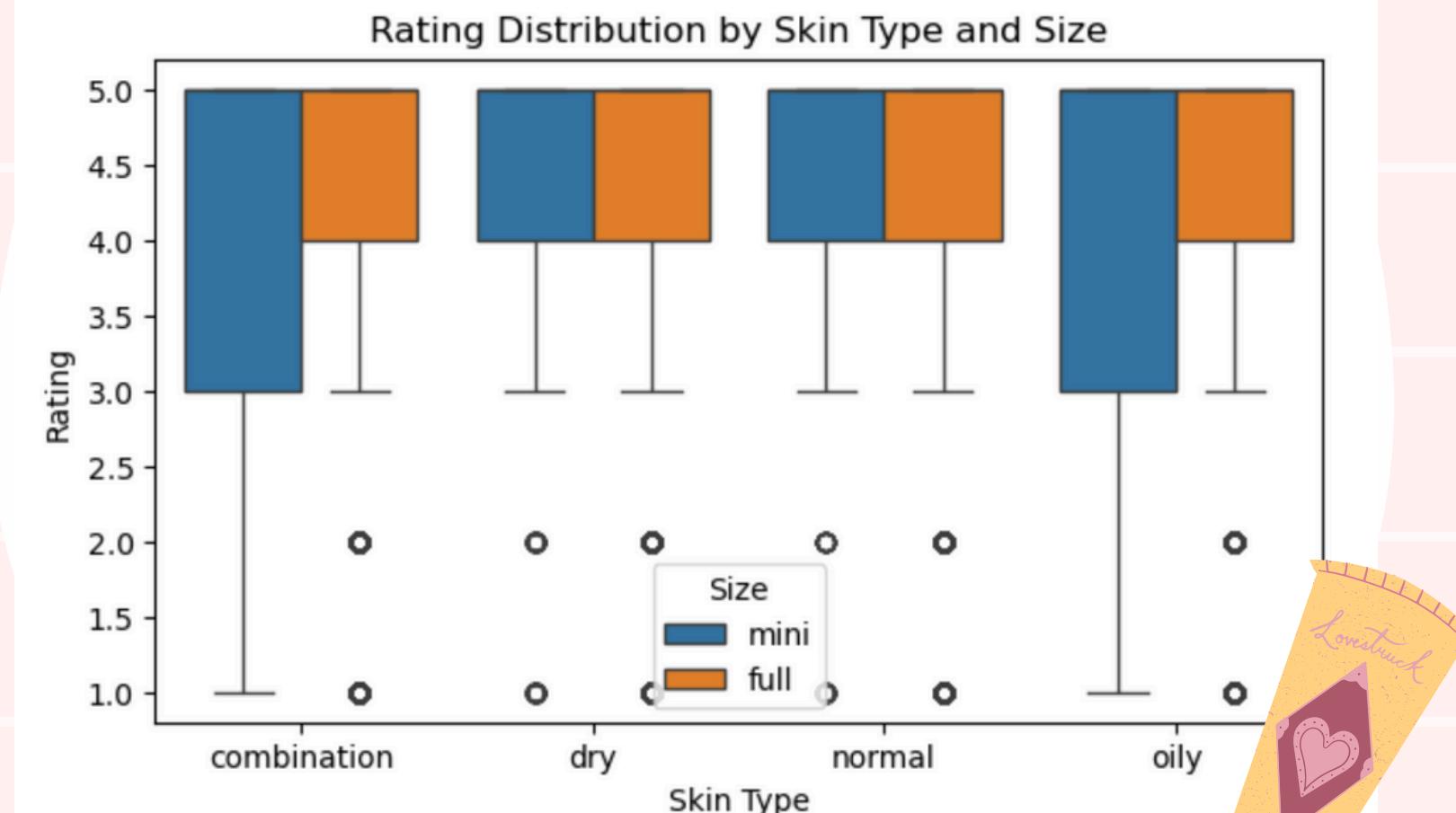
09

Findings

- Differences between mini and full sizes are visible across every skin type
- Full-size products are more tightly clustered around 4-5 stars
- Mini products have more low-rating outliers

Conclusion

- Product size does significantly impact ratings
- Full-size products tend to perform better than mini versions
- This visual supports the statistical result
 - ($p\text{-value} = 1.12 \times 10^{-8}$)



RATING & RECOMMENDATION BEHAVIOR

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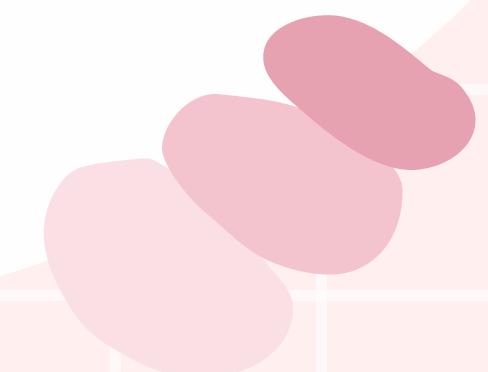
Findings

- Nearly 79% of products are recommended
- Earlier results show most products receive 4-5 star ratings
- High recommendation rates align with the overall high ratings

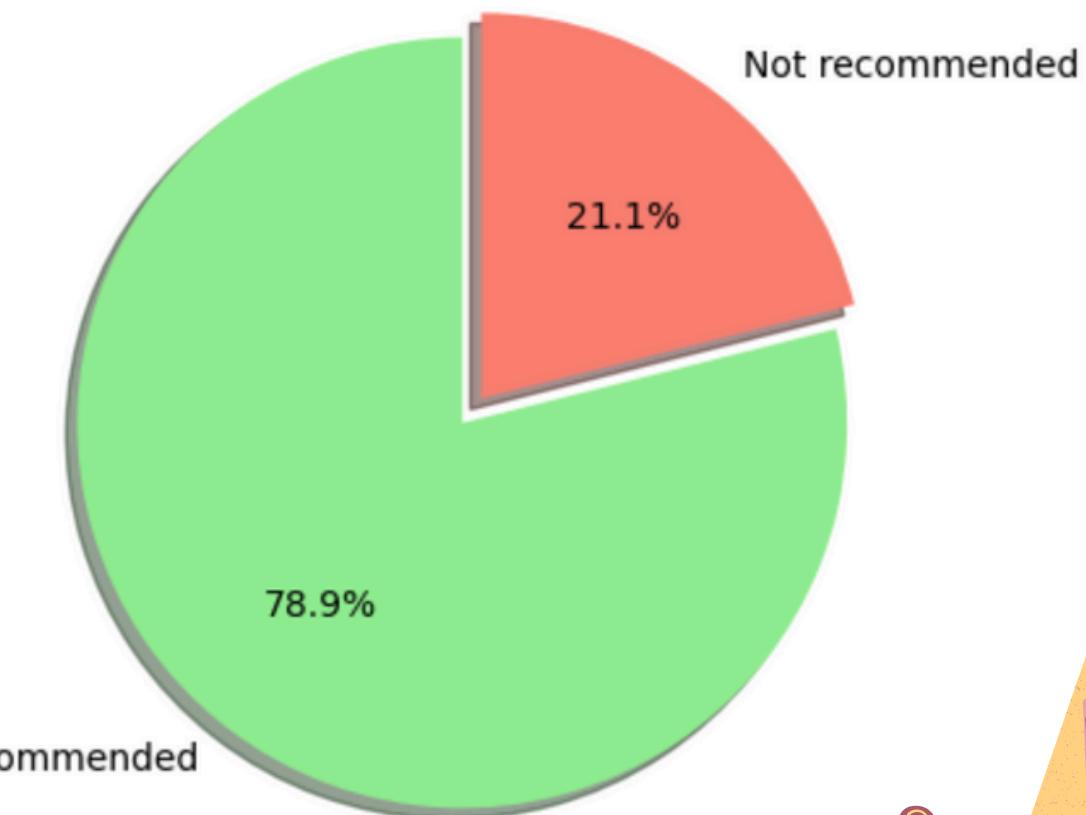


Conclusion

- Products with higher ratings are more likely to be recommended
- This supports a positive relationship between rating and recommendation



Recommendation Breakdown





CONCLUSION & RECOMMENDATIONS

Key Insights

- Most skincare products receive positive ratings
- Skin type has minimal impact on overall rating
- Price has a weak effect on ratings
- Product size significantly affects ratings
- Higher ratings strongly drive recommendations



Business Recommendations

- Brands should prioritize full-size product performance
- Mini products may need reformulation or expectation management
- Consumers should not rely on price alone when choosing skincare
- Ratings and reviews remain the most useful decision tool





THANK YOU



RESOURCE PAGE

- https://www.kaggle.com/datasets/nadyinky/sephora-products-and-skincare-reviews?select=reviews_1250-end.csv
- <https://github.com/ctruong2837/BSAN-final-project>

