



AMAZON BEAUTY REVIEW

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INTRODUCTION

Analzying customer data on Amazon beauty products and uncover patterns between textual sentiment, star-based ratings, and the effects on overall brand choice and product popularity.

Main Question: Is there a correlation between reviews, sentiment, and star ratings?

1. Purpose: To analyze customer feedback on Amazon beauty products and uncover patterns between textual sentiment and star-based ratings, time period trends, and overall user's reasoning behind buying certain products and their popularity.
2. Beauty product sellers and marketers on Amazon, Data analysts studying consumer behavior, and Product development teams



METHODOLOGY

Dataset:

- Source: Amazon Reviews 2018
- Each row = One product review

Key Features Used:

- Star rating (overall)
- Verified purchase (verified)
- Review text (reviewtext)
- Review length

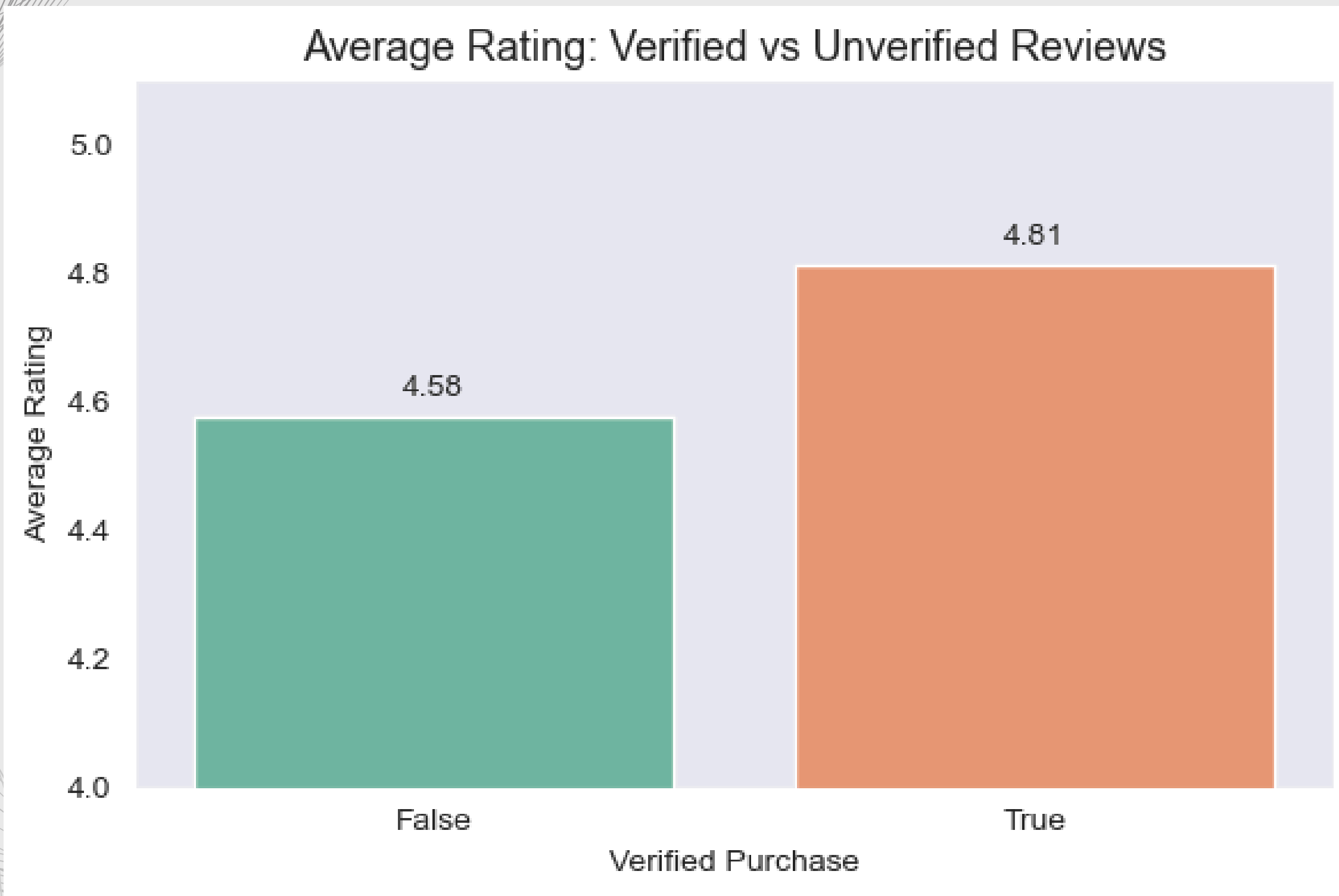
Tools:

- Jupyter Notebook
- Python libraries: pandas, seaborn, matplotlib, TextBlob



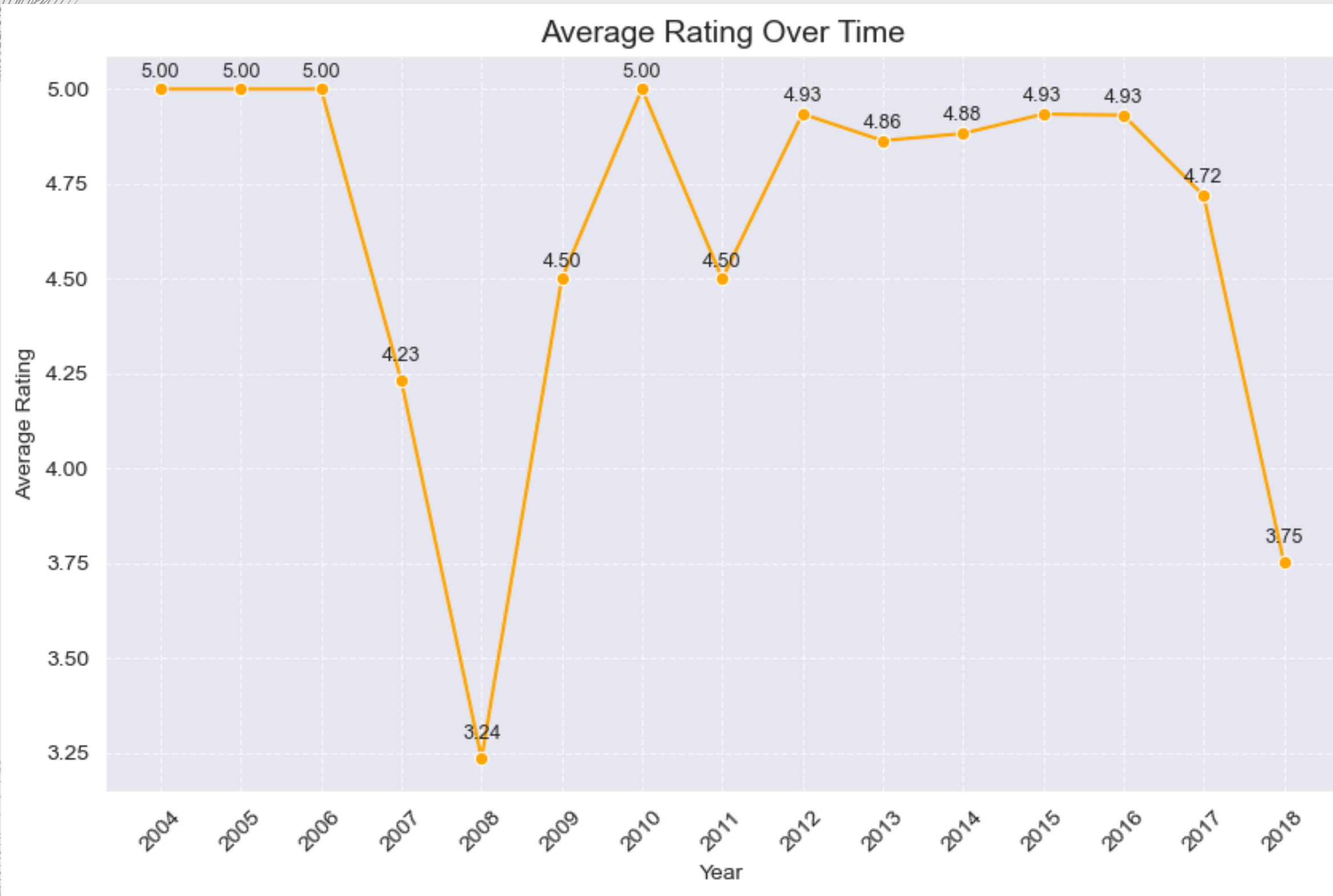
RESULTS

Do verified purchase reviews differ in rating compared to unverified ones?



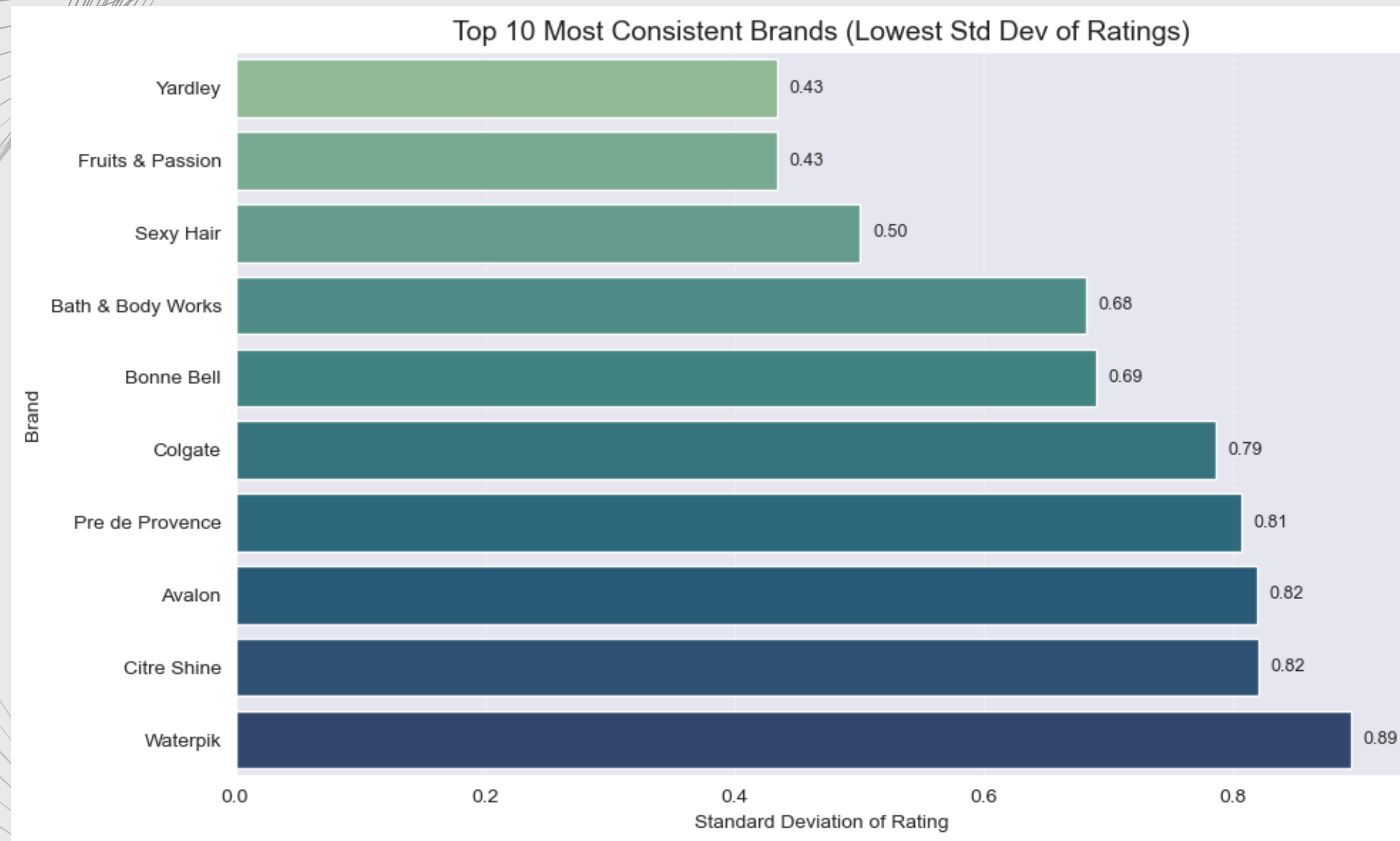
- Verified purchases have a higher average rating than unverified ones.
- Unverified reviews show slightly more extreme (low or high) ratings.
- Verified reviews may reflect more genuine customer experiences.

Are there temporal trends in reviews – do ratings trend higher or lower over time?



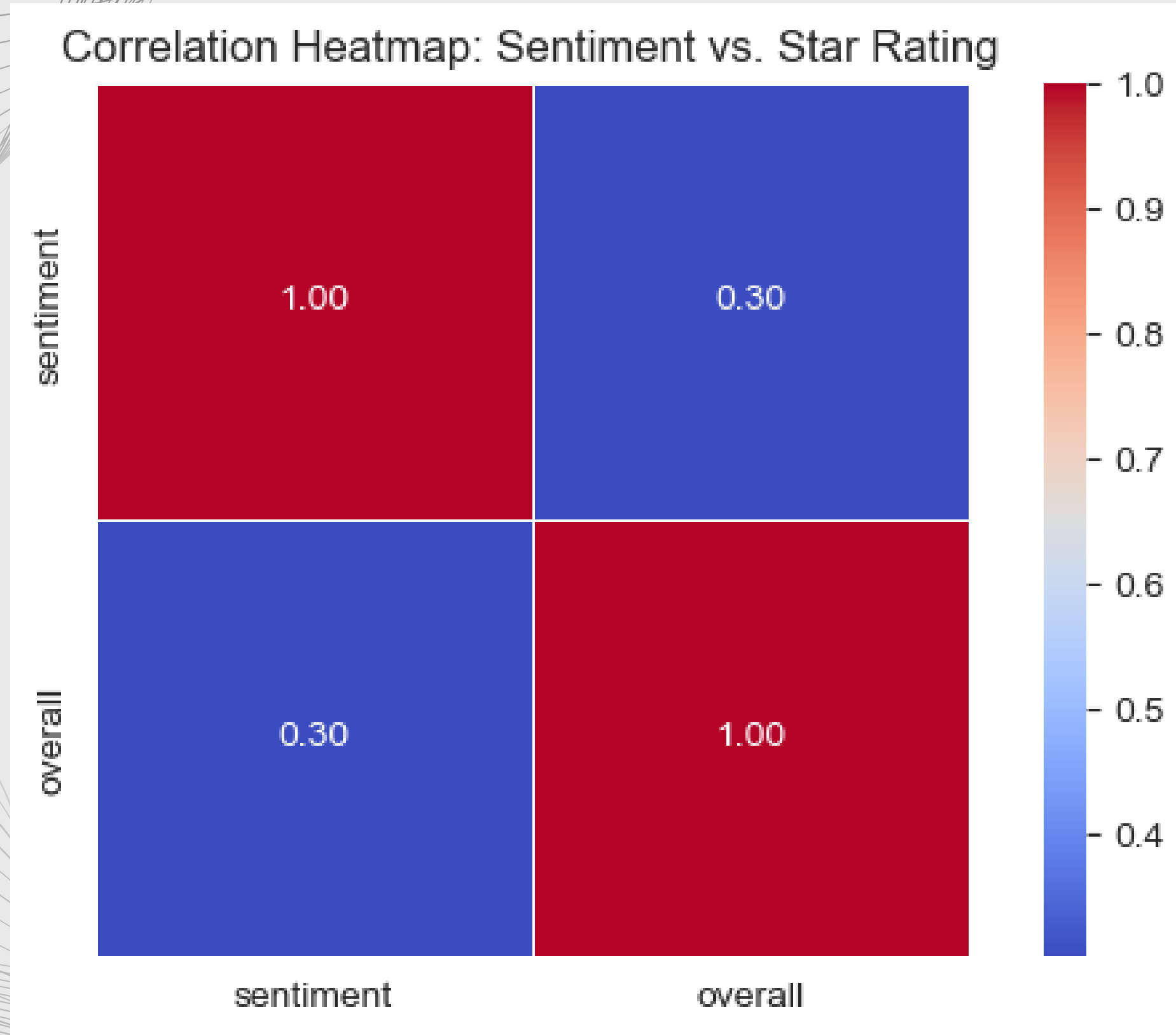
- Ratings fluctuated significantly between 2007–2009, reaching a low in 2008 (3.24)
- More recent years show consistently high ratings, except for a decline in 2018.
- External factors (policy changes, product updates, platform adjustments) may influence rating trends.

Which brands receive the most consistent ratings?



- Yardley and Fruits & Passion had the lowest standard deviation (0.43), suggesting consistent customer satisfaction.
- Brands like Waterpik showed higher rating variability.
- Lower standard deviation = more predictable customer satisfaction = brand reliability.

Is there a correlation between the sentiment of review text and the star rating?



- Sentiment polarity shows a positive correlation (0.30) with star rating.
- Higher sentiment scores generally align with higher star ratings.
- Textual analysis is a useful early signal for product satisfaction before ratings shift.

What Do These Insights Mean?

- Focus on Verified Purchase Programs
 - Encourage verified reviews via post-purchase emails or incentives – they trend more positive and build trust.
- Monitor Sentiment in Real Time
 - A 0.30 correlation shows sentiment can forecast rating drops. Use automated tools to flag rising negative tone.
- Leverage Consistency as a Brand Asset
 - Brands with stable ratings (like Yardley) should highlight this in marketing copy – “Trusted by thousands, consistently.”
- Investigate Temporal Spikes
 - Analyze time periods with lower ratings for potential operational or product issues (e.g., changes in formulation, packaging, or logistics).
- Use Standard Deviation to Assess Risk
 - High variability in ratings could point to quality control issues or niche customer satisfaction.

Future Work

What new questions emerged from this project?

- How do specific product types (e.g., skincare vs. haircare) compare in sentiment and rating consistency?
- Are certain keywords or phrases in reviews strong predictors of low ratings?
- How do ratings correlate with price, brand size, or product rank?
- Are there time-based patterns within specific brands (e.g., did a formula change affect ratings)?

What still needs to be answered?

- How does review helpfulness influence sentiment or rating trends?
- Is there bias in reviews based on product visibility (e.g., top-ranked products getting inflated ratings)?
- Can verified reviews be trusted as proxies for genuine sentiment, or are they more susceptible to incentivization?



THANK YOU