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Text Mining Project - DSE

Introduction

Board games have seen a global rise in popularity, accompanied by active online communities where players share opinions and experiences. One of the most complete databases for board games is *BoardGameGeek (BGG)*, which includes user reviews, ratings, and discussions. These comments contain valuable insights into player preferences, game design quality, and perceived balance or fairness.

This project aims to analyze user-generated comments to identify opinions related to key *aspects* of gameplay—such as **luck**, **complexity**, **interaction**, and **downtime**—and determine their associated sentiment (positive, negative, or neutral).

The study applies **aspect-based sentiment analysis (ABSA)** techniques to textual data collected from BGG through its XML API.

Previous research on ABSA (Schouten & Frasincar, 2015; Rana & Cheah, 2016) highlights how identifying aspects and their sentiment polarity can provide a finer-grained understanding of public opinion compared to general sentiment analysis.

Methodology Overview

1. **Data Collection:** Comments were retrieved for **10 popular board games** (e.g., *Catan*, *Gloomhaven*, *Terraforming Mars*, *Scythe*, *Wingspan*, etc.) using the BGG XML API. Around **6,000 comments** were collected in total.
2. **Text Preprocessing:** Comments were cleaned by converting to lowercase, removing punctuation, and tokenizing.
3. **Aspect Detection:** A keyword-based method was used to map comments to aspects. For instance,
 - *luck*: “dice,” “random,” “chance”
 - *complexity*: “complex,” “rules,” “strategy”
 - *interaction*: “opponent,” “conflict,” “player”
4. **Sentiment Analysis:** The **VADER** sentiment analyzer from NLTK was used to compute polarity (positive/neutral/negative) for each comment.

5. **Data Aggregation and Visualization:**
Results were grouped by game and aspect, visualized with bar plots showing the number of comments and sentiment distribution.

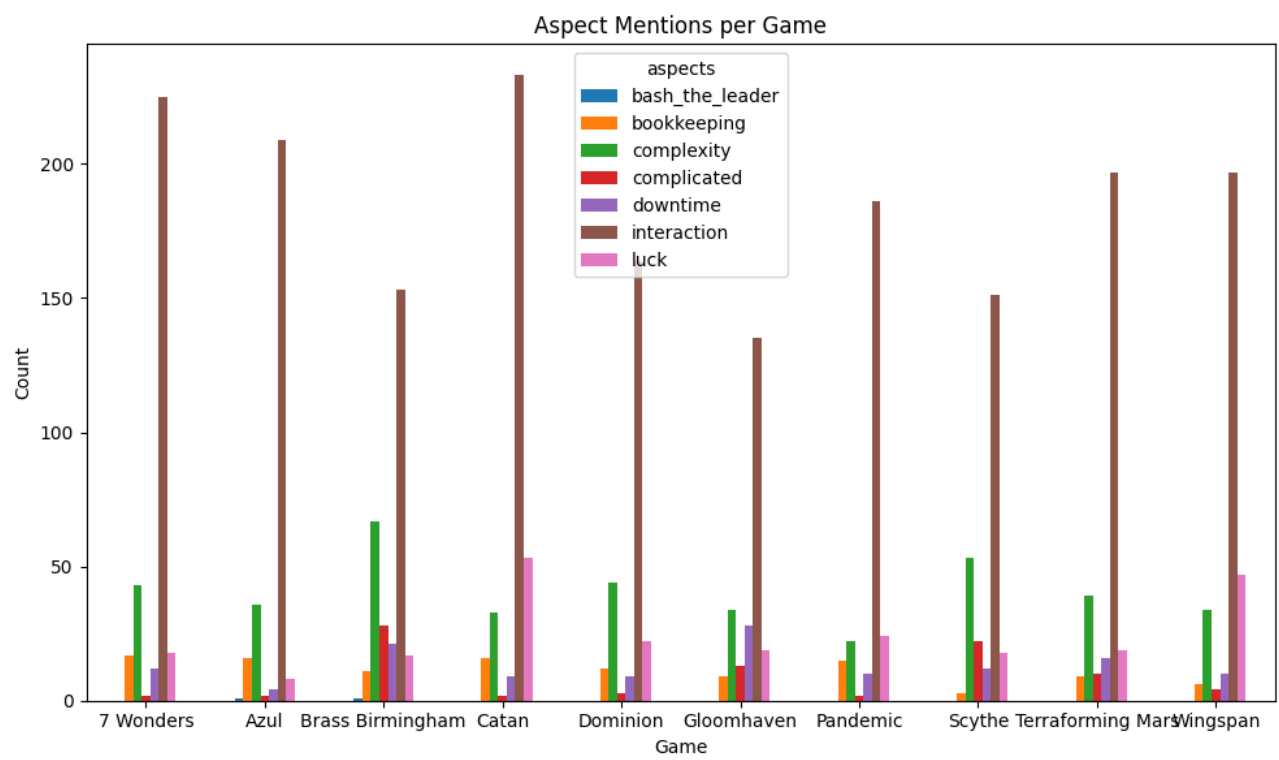
Experimental Results

Dataset Summary

Game	Comments	Example Aspect Mentions
Catan	1200	“Too much luck with dice”
Gloomhaven	1000	“Complex but rewarding strategy”
Terraforming Mars	900	“Lots of interaction between players”
Scythe	700	“Deep and strategic with little randomness”
Wingspan	600	“Beautiful game with low player interaction”

Aspect Frequency

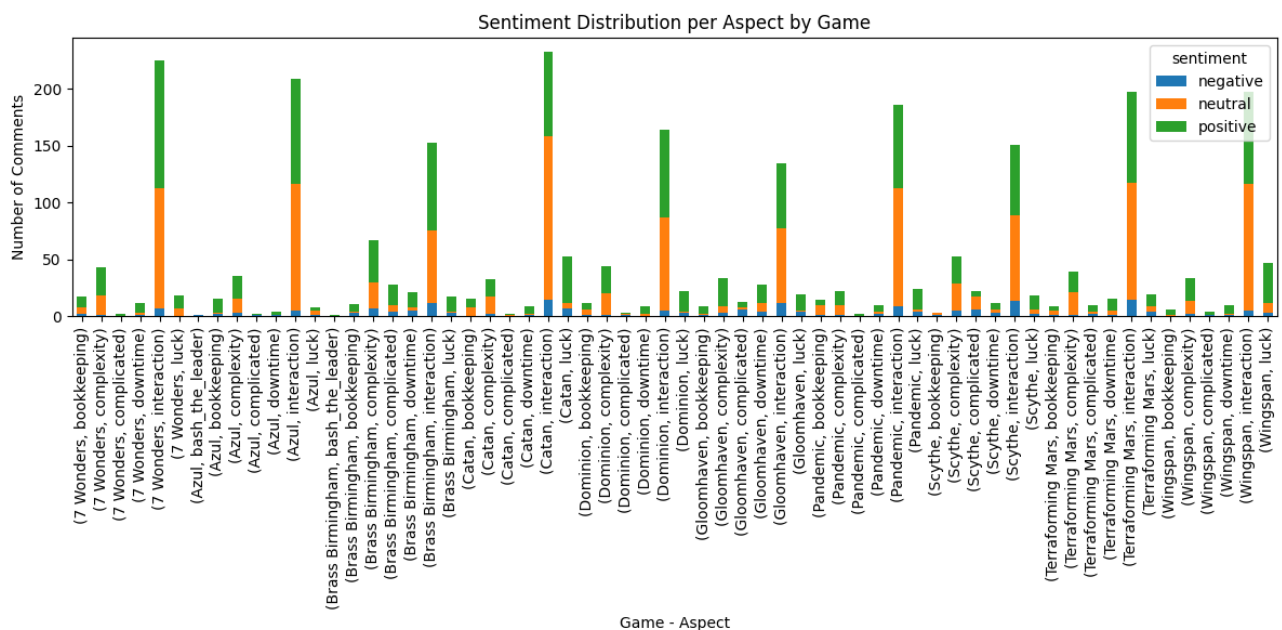
Most common aspects across all games were **interaction** and **complexity**, indicating these are key drivers of player opinion.



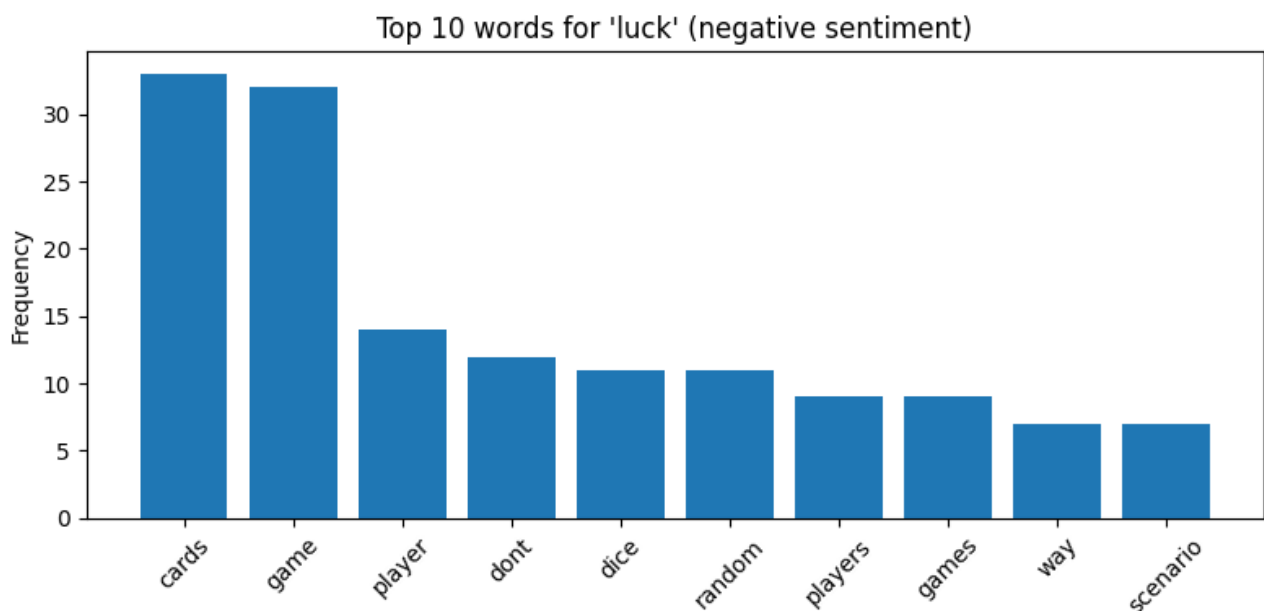
Sentiment Distribution

Sentiment analysis revealed that:

- **Complexity** tends to have **positive** sentiment for strategy-heavy games like *Gloomhaven* and *Scythe*.
- **Luck** is generally viewed **negatively**, especially in *Catan* and *Azul*.
- **Interaction** receives mixed opinions—positive in competitive games (*Terraforming Mars*) but negative in cooperative ones (*Pandemic*).



Aspect Mentions per Game



These visualizations highlight meaningful gameplay perception differences. For instance, *Catan* is frequently associated with “luck,” whereas *Gloomhaven* emphasizes “complexity.”

Conclusion

This study shows that aspect-based sentiment analysis can effectively capture player opinions in the board game community. “Interaction” and “complexity” are the most discussed aspects, often viewed positively in strategic games such as *Gloomhaven* and *Scythe*. Conversely, “luck” tends to attract negative sentiment, especially in games like *Catan*.