Group Recommendations: Handling Disagreement

- Simply choosing movies with the highest average ratings may leave some group members unhappy.
- To fix this, we need a way to **measure disagreement** between users and include it when generating group suggestions.
- The goal is to **find a fair balance** between what most people like and what nobody hates.

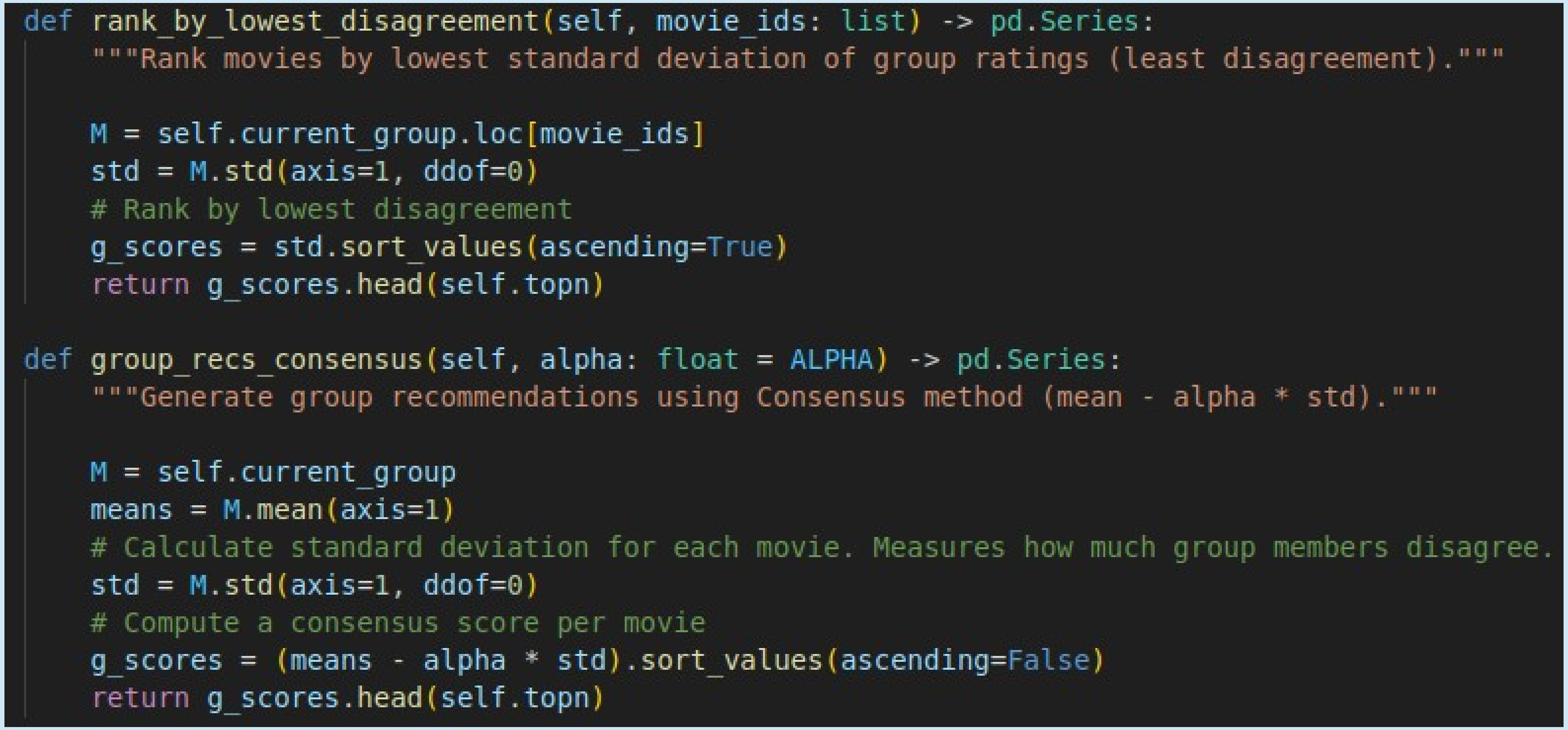
Two approaches for generating group recommendations

1) **Two-stage ranking:** Get top n movies with a selected method first (pearson, spearman) and strategy (average, least misery). Then we apply rank_by_lowest_disagreement-function for the result, which reranks the top n movies in asceding order by std

2) **Consensus scoring:** Compute the mean and standard deviation for all movies, then calculate a consensus score for each one using the following formula:

$$\text{Consensus}_\alpha(i) = \hat{r}_i - \alpha \cdot \text{Disagree}(i)$$

Implementation



```python
def rank_by_lowest_disagreement(self, movie_ids: list) -> pd.Series:
    """Rank movies by lowest standard deviation of group ratings (least disagreement)."""

    M = self.current_group.loc[movie_ids]
    std = M.std(axis=1, ddof=0)
    # Rank by lowest disagreement
    g_scores = std.sort_values(ascending=True)
    return g_scores.head(self.topn)

def group_recs_consensus(self, alpha: float = ALPHA) -> pd.Series:
    """Generate group recommendations using Consensus method (mean - alpha * std)."""

    M = self.current_group
    means = M.mean(axis=1)
    # Calculate standard deviation for each movie. Measures how much group members disagree.
    std = M.std(axis=1, ddof=0)
    # Compute a consensus score per movie
    g_scores = (means - alpha * std).sort_values(ascending=False)
    return g_scores.head(self.topn)
```

Why it helps?

- A very high mean from split opinions (love/hate) gets penalized.
- Higher chance everyone is okay with the pick (lower risk of someone hating it).
- Ff everyone likes an item more, its consensus score rises.
- It’s a drop-in replacement for Average. Only parameter is α