STAT992 Final Project:
Genre Identification with IMDB Data

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University of Wisconsin–Madison

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Background

Summary from proposal

1. IMDB data of movies & cast (goal: identify genres)
2. Initial vsp clustering sensitive to country/language
3. Filtered out non-English titles; vsp still sensitive to cliques
4. New goal: mitigate influence of cliques to improve genre detection

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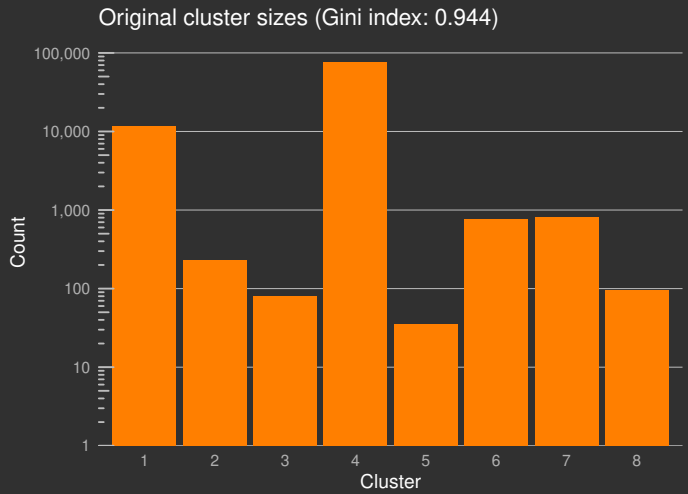
Previous clusters



Some of the clusters:

2. H20 wrestling recordings
3. Blondie movies
4. Westerns
7. RiffTrax releases
8. Christian "documentaries"

$$\text{Gini} = \frac{1}{2n^2\bar{x}} \sum\sum |x_i - x_j|$$

(more equal) $0 \leq G \leq 1$ (less equal)

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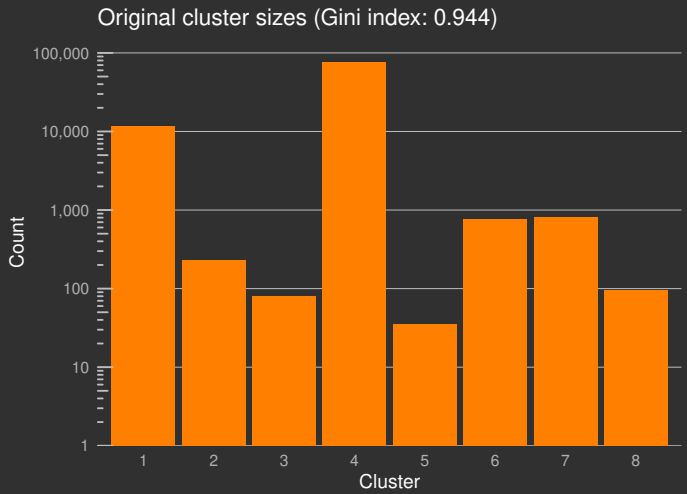

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Method 1: Predicting Node Cliquishness by Logistic Regression (LR)

Approach

1. Generate node statistics
2. Predict node “cliquishness” using logistic regression

Training Data

1. Clique nodes: All titles from cluster 3 and 5. Top 100 from 2 and 7.
2. Non-clique nodes: 670 titles from IMDB top/favorite lists.

Node Statistics

1. Degree
2. Coreness
3. No. triangles at each node
4. Degree distribution to other nodes
    1. Mean, mode
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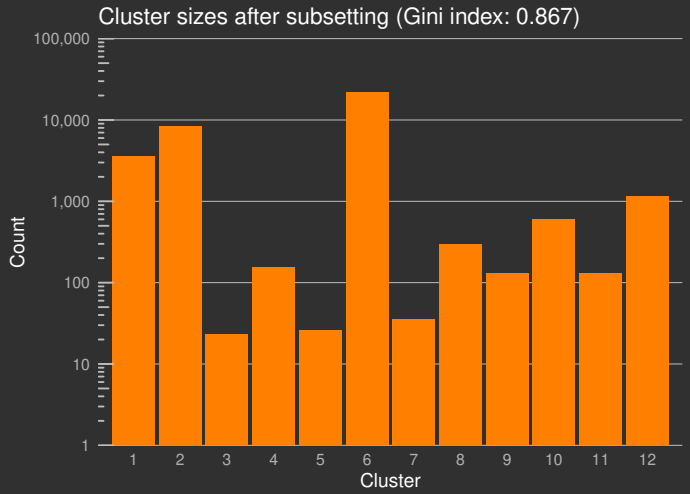

1. Gini slightly lower
2. $k = 8$ no longer best choice, use $k = 12$ instead
3. Clusters look much better
4. Link to results

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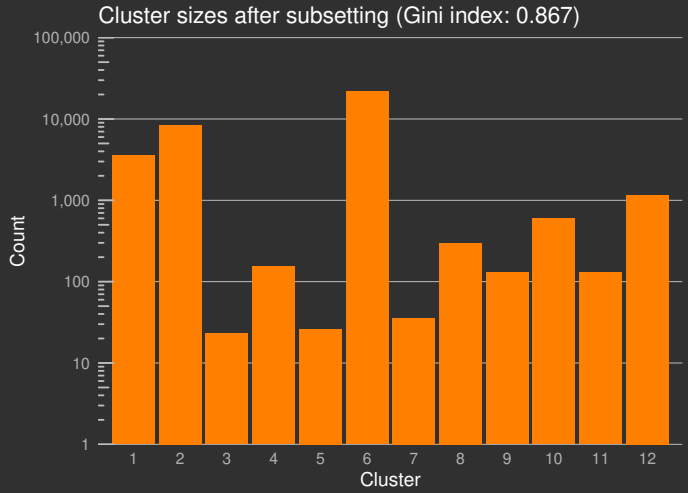

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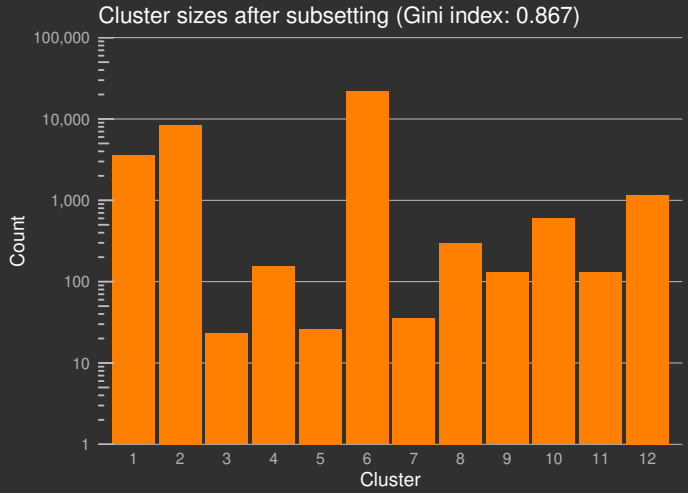

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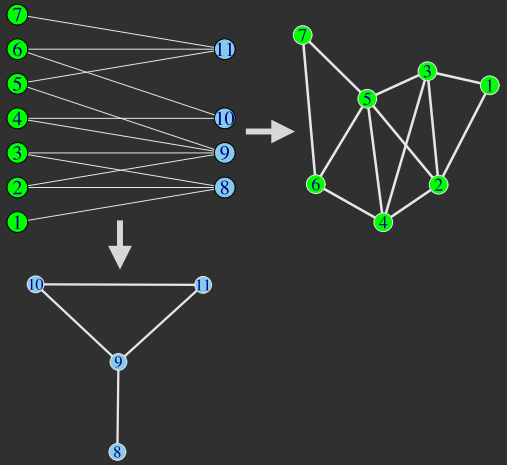
Method 2: Transformation of Projected Adjacency

Bipartite graph projection

1. IMDB graph is bipartite
2. Project to titles $\times$ titles
3. Adjacency of projection may show cliques
4. Transformed adjacency may improve clusters
5. Used $\log_2(AA^T + 1)$



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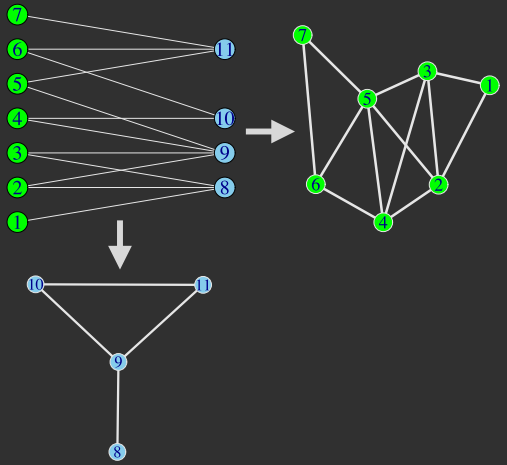

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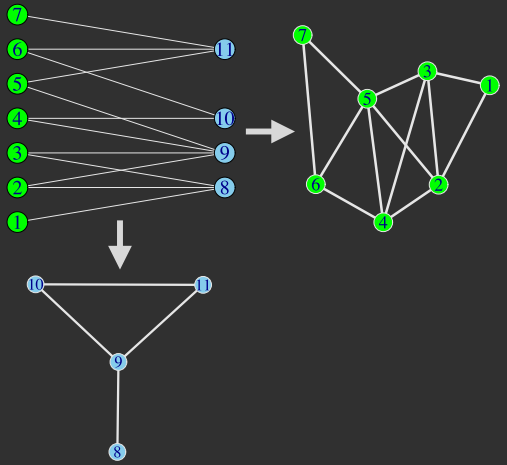

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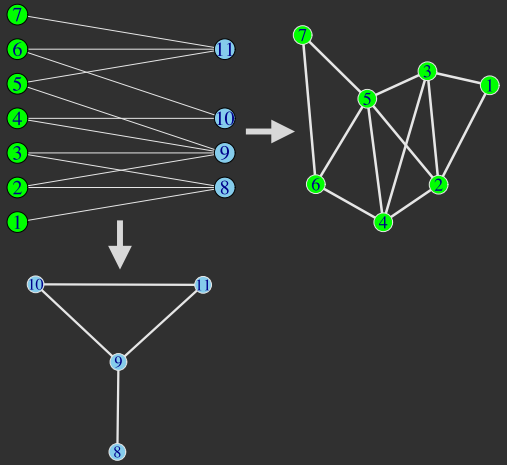
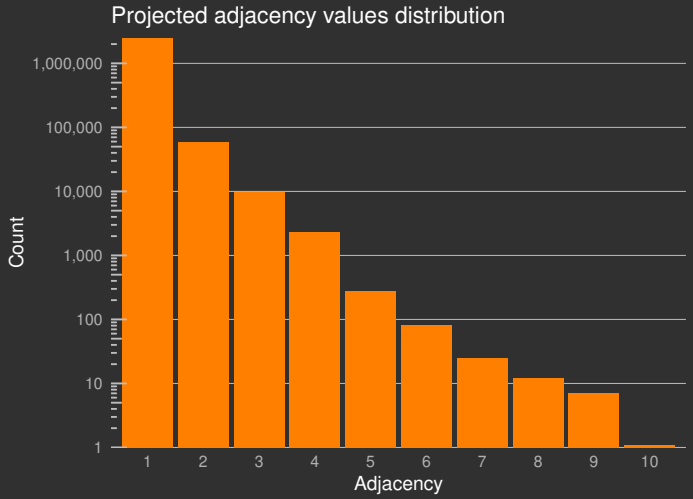


Projected IMDB adjacency matrix



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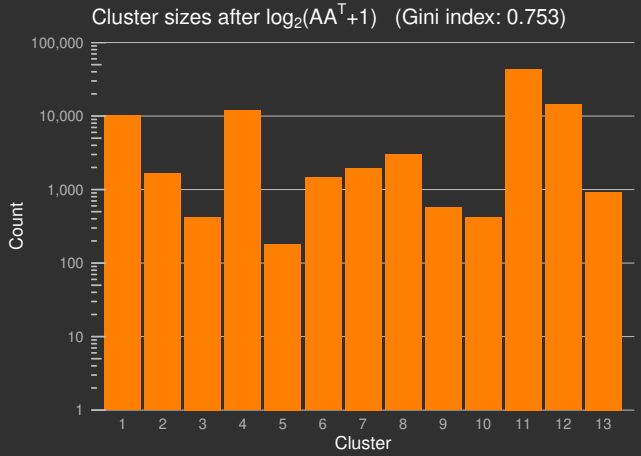

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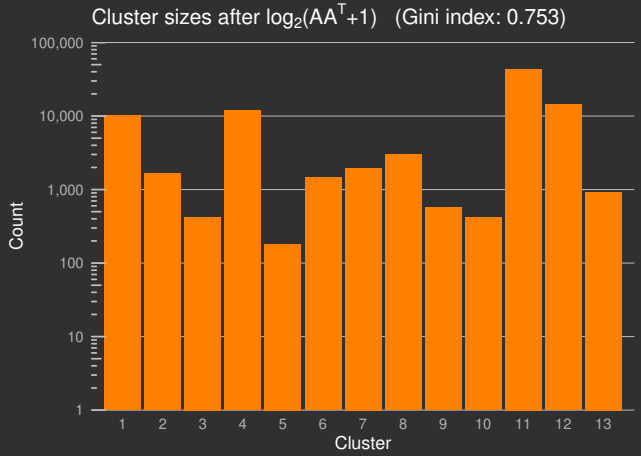

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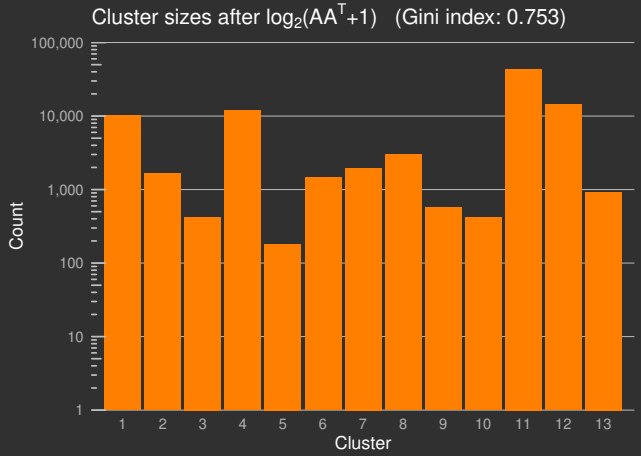

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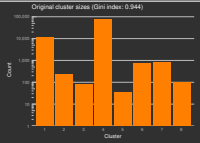
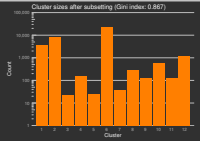
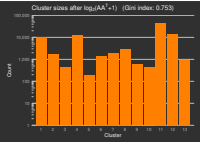
Summary

Results summary

Method	Clusters	Gini	Cluster quality
Original		0.944	bad, lots of cliques
Logistic regression		0.867	pretty good
Adjacency transform		0.753	also pretty good

Future work?

Ideas:

1. Use Personalized Page Rank (PPR) to identify cliquish nodes to contract
2. Scrape movies' descriptions, turn into bag of words, then run vsp

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Acknowledgements

Special thanks to Karl Rohe for
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