

*What do you recommend  
we watch?*

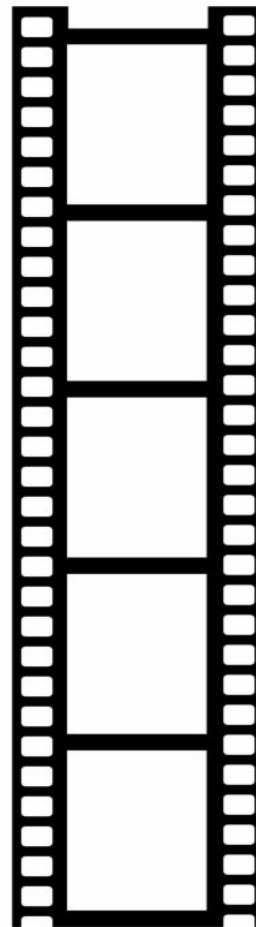
**By: Zach Hyde**

# Business Case

A new streaming company, LiveWire, is beginning to understand the market that has the majority of its viewers utilizing streaming systems such as: Netflix, Amazon Prime, and Hulu. LiveWire needs the help of a Data Scientist to understand what movies are best to include in its library that are appealing to a wide variety of viewers and needs a recommendation system like these other large brand names have to keep the consumer engaged and interested with their product.

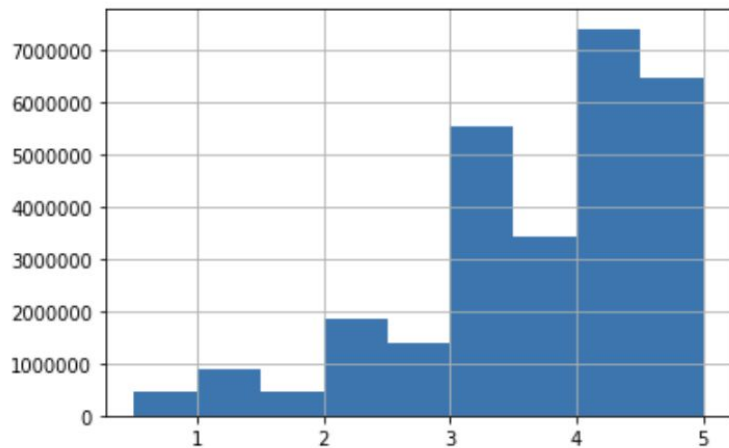
## Questions for the modeling:

1. What are the top 5 genres that should be focused on when adding to the library?
2. How can a similar user help the recommendation system suggest movies to a new user?
3. What are the top ten movies recommended to a user?

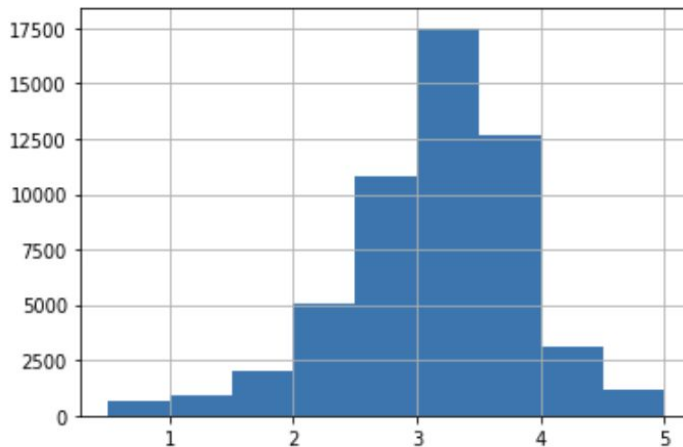


# EDA

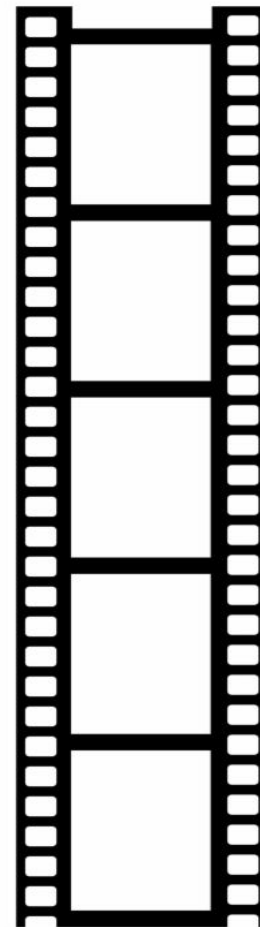
## Observation of Movie Ratings



Rating

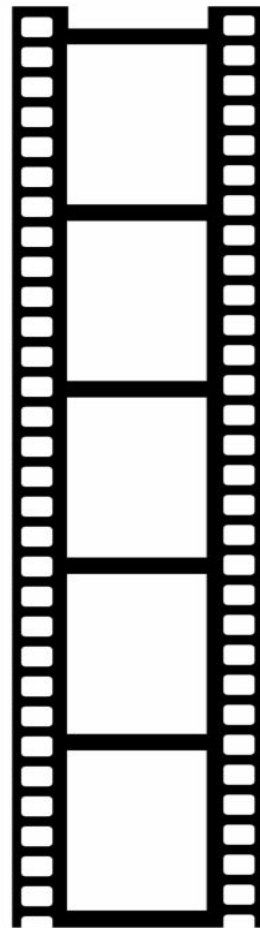


Average Rating



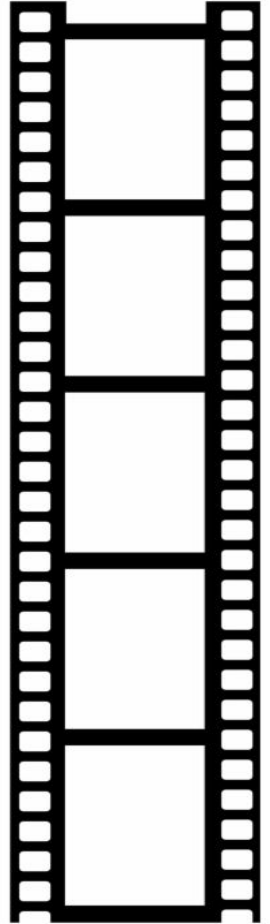
# Modeling

- **KNNBaseline**—A basic collaborative filtering algorithm taking into account a *baseline* rating.
- **SVD**—a matrix *decomposition* method for reducing a matrix to its constituent parts in order to make certain subsequent matrix calculations simpler.
- **SVDpp**—The *SVD++* algorithm, an extension of **SVD** taking into account implicit ratings
- **NMF**—A collaborative filtering algorithm based on Non-negative Matrix Factorization.



# Business Recommendations

Utilizing this type of modeling is essential to understanding the user's tendencies and preferences on what movies they like to watch and how they rate similar genres. When a business has an effective recommendation system to provide to the consumer of their product, they will be able to effectively market the product to them by providing similar interests to the consumer, keeping them engaged and loyal to the brand.



# Final Model

SVD

Before hyper parameters

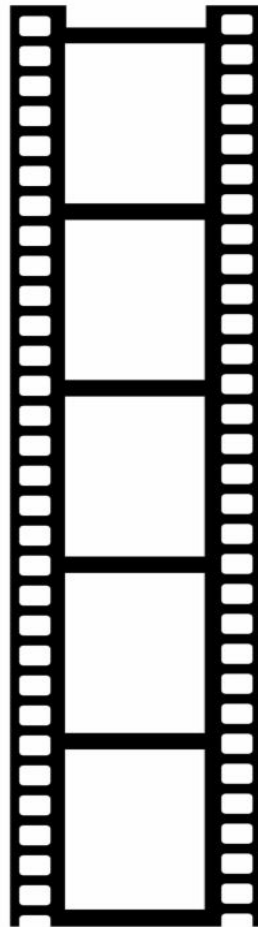
RMSE: 0.5104

Accuracy: 0.5103684437760265

After hyper parameters

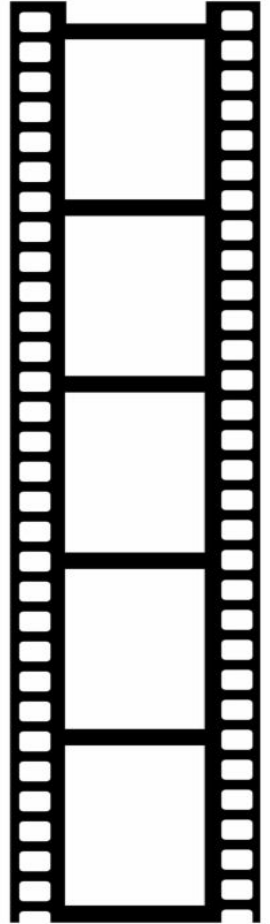
RMSE: 0.5104

Accuracy : 0.51036533003348



## Future Recommendations

- Break down the data more before entering it into histograms by creating sub-categories (i.e. user vote counts and their mean rating, collecting standard dev. Of their avg. rating compared to avg of whole)
- Try other models (all similar results during initial project, so chose model with best RMSE out of the four models utilized)
- Possible web scraping of Netflix, Hulu and AmazonPrime to have wider cast of data information available on same movies rather than one database.



# Thank You!

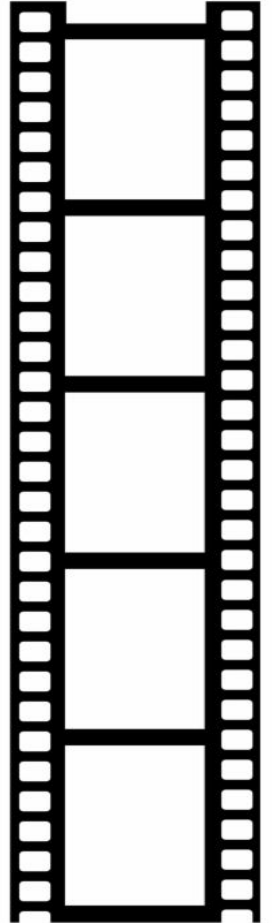
Please reach out for any questions or suggestions!

[Github Repository](#)

Email: [Here](#)

Github Profile: [zhyde23](#)

Linkedin: [Profile](#)





# Providing relevant product recommendations isn't easy

Technology provides solutions to existing and emerging problems

Keeping up with rapidly changing customer preferences feels out of reach with my current forecast methods



Merchandising Director

I need to be able to meet demand anywhere, on any channel, but I'm hindered by disconnected processes



COO

I want products to delight customers, but we lack up-to-date SKU and trend information



Sales Director

Providing more personalized, relevant offers to clients would require mobile analytics that I don't have



Sales Associate

I want technology to be a growth engine for the business, but legacy systems hold me back



Analytics Director

**18.5%**

growth in the number of SKUs stored in distribution centers in 2015<sup>4</sup>

**1.5%**

increase in US manufacturers' and trade inventories from 2015-2016<sup>3</sup>

**143%**

of inventory per total sales is the amount of stock US retailers are sitting on<sup>1</sup>

**44%**

of CPGs don't have adequate resources to interpret analytics outputs<sup>2</sup>

<sup>1</sup> <http://www.scdigest.com/assets/news/news/15-04-23-1.php?cid=9231>

<sup>2</sup> EKN Survey 2016

<sup>3</sup> [https://www.census.gov/mtis/www/data/pdf/mits\\_current.pdf](https://www.census.gov/mtis/www/data/pdf/mits_current.pdf)

<sup>4</sup> [http://www.supplychain247.com/article/2015\\_warehouse\\_dc\\_operations\\_survey\\_results](http://www.supplychain247.com/article/2015_warehouse_dc_operations_survey_results)