Personalized Anime Recommendation System

Collaborative Filtering Using Implicit Feedback Data to Provide Better Anime Recommendations

By Melvin Garcia
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Capstone Project
Flatiron Cohort - onl01-dtsc-pt-011121

Outline

- Business Problem
- Data & Methods
- Results
- Conclusions

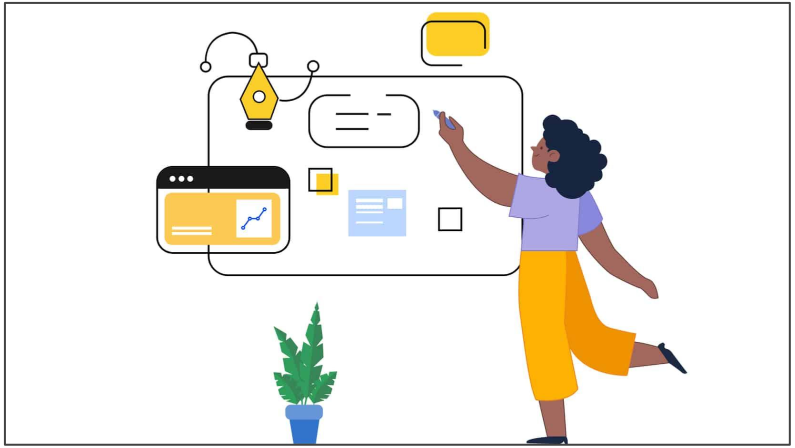
Business Problem

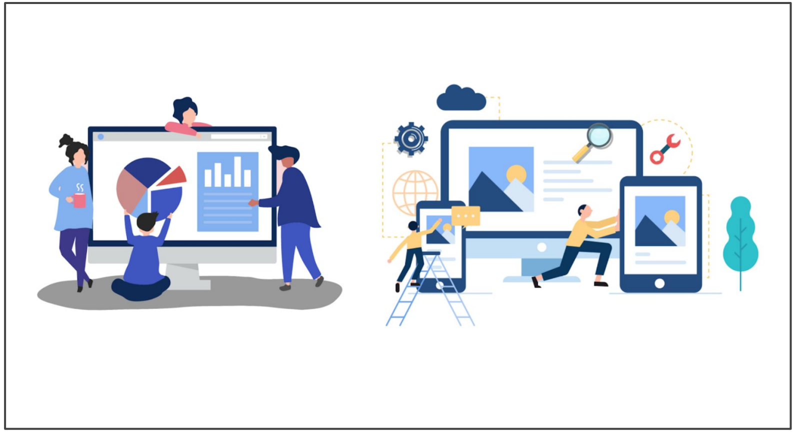
- Tastyroll aims for less reliance on content-based and explicit feedback data
- Quantity of implicit data at Tastyroll far outweighs amount of explicit feedback data
- Create improved recommender system designed to primarily work with implicit data


https://www.fiverr.com/qdom10/give-you-some-anime-recommendations

Data & Methods

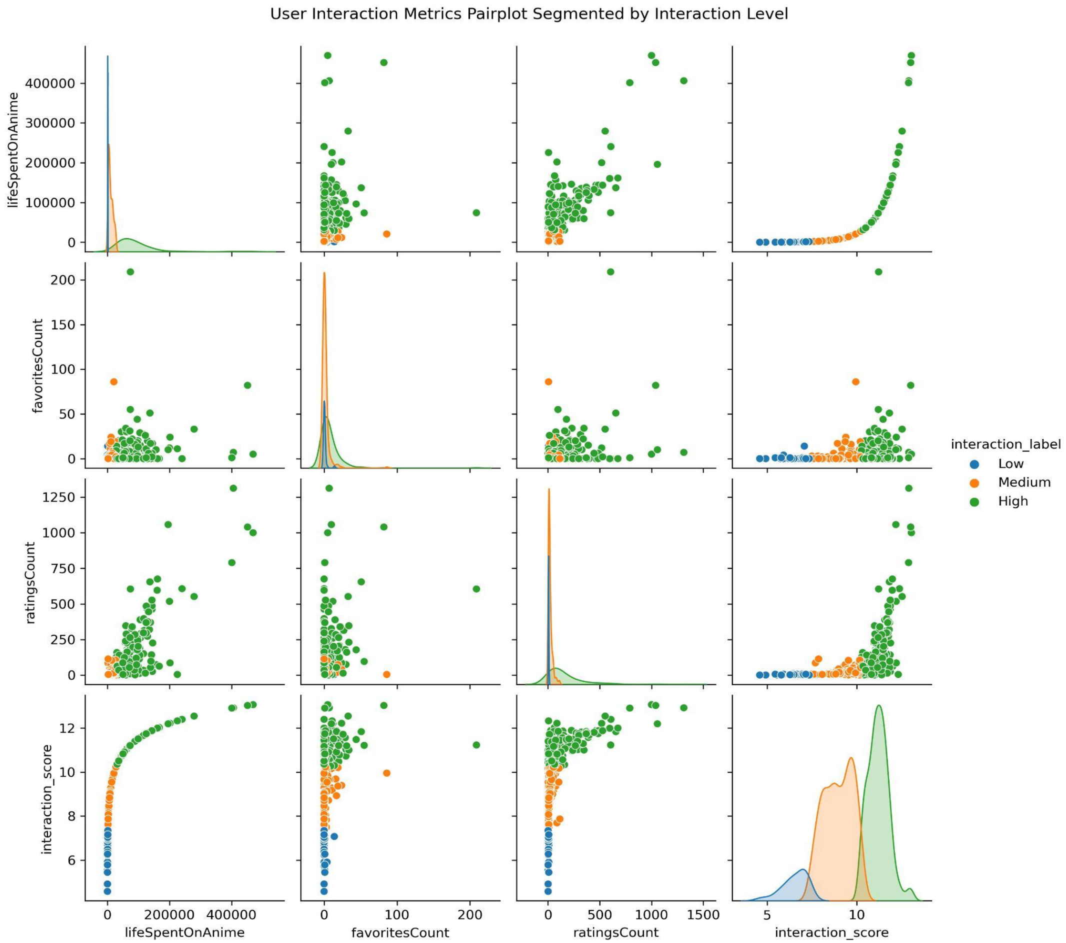
- Data is query-able from the the [Kitsu API]
- Request user data and metrics around
  - Time spent on anime
  - Ratings count
  - Favorites count etc
- Request user-anime interaction data
  - Favorited
  - Watch status
- Segment Users into level of anime engagement
- Model creation and evaluation





https://www.divami.com/blog/best-practices-for-user-interaction-and-user-engagement/

Results - User Segmentation



Results - Qualitative Evaluation Example

User 70211 Example Data

Favorites List
Fate/stay night: Unlimited Blade Works
Lupin III
Lupin III vs. Detective Conan
Akatsuki no Yona
Gugure! Kokkuri-san
Gintama
Gintama: The Movie
Gintama': Enchousen
Gintama Movie 2: Kanketsu-hen - Yorozuya yo Ei..
Psycho-Pass

Comparing the anime content from a user's favorites list to the model's recommended list

Recommended List
Dragon Ball Z
Higurashi no Naku Koro ni Re
Yu-Gi-Oh
Tokyo Ghoul
Mobile Suit Gundam
Baccano!
Toradora!: Bentou no Gokui
Full Metal Panic
Barakamon
My Little Monster

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Shonen / Action

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Psycho-Pass

Mystery / Thriller

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Studio / Publisher

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Results - Evaluation Metrics

Precision at k = 3.6

- Precision at k (p at k) is the proportion of recommended items in the top-k set that are relevant
- For example, if p at k is 8 or 0.8 for a top-10 recommendation problem, then 80% of the model's recommendations are relevant

Results - Evaluation Metrics

Model AUC	Most Popular AUC
0.623	0.616

- Our model AUC slightly edges that of a baseline model of just recommending most popular anime
- Not incredibly impressive, but our working recommendation model performs slightly better

Conclusions & Next Steps

- Based on the two evaluation metrics: precision at k and AUC, there can definitely be improvements on our recommendation model
- Satisfied with the qualitative assessment, but the example user was a highly active user, and so further assessments are needed for varying levels of active users
- Examine more interaction / implicit endpoints within the Kitsu API (ie commented, reviewed, quantifying time watched, binge vs casual watchers…)

Next Steps

- Expand and train our models on a larger dataset
- Enrich our content based model by adding plot descriptions, cast, and crew to our dataset
- Prove (or disprove) higher user engagement metrics using the new hybrid recommender system through a set of designed A/B tests

Thank You!

Email: garciamelvin4@gmail.com
GitHub: @melvyg
LinkedIn: linkedin.com/in/melvinmgarcia/