

Personalized Anime Recommendation System

Collaborative Filtering Using Implicit Feedback Data to Provide Better Anime Recommendations

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Capstone Project
Flatiron Cohort - onl01-dtsc-pt-011121



Outline

- Business Problem
- Data & Methods
- Results
- Conclusions

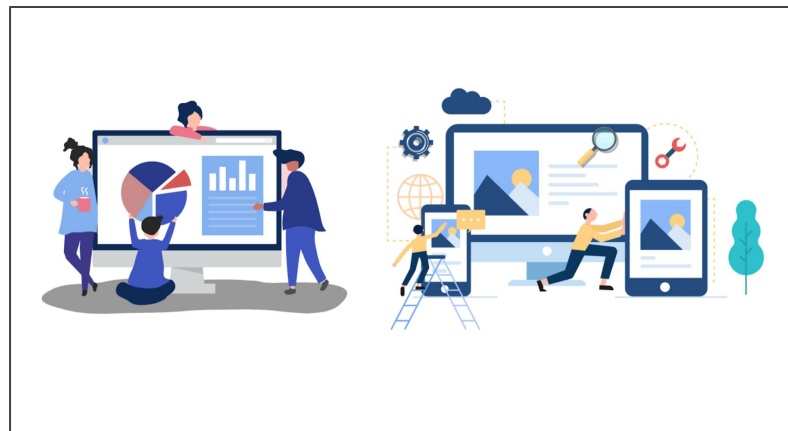
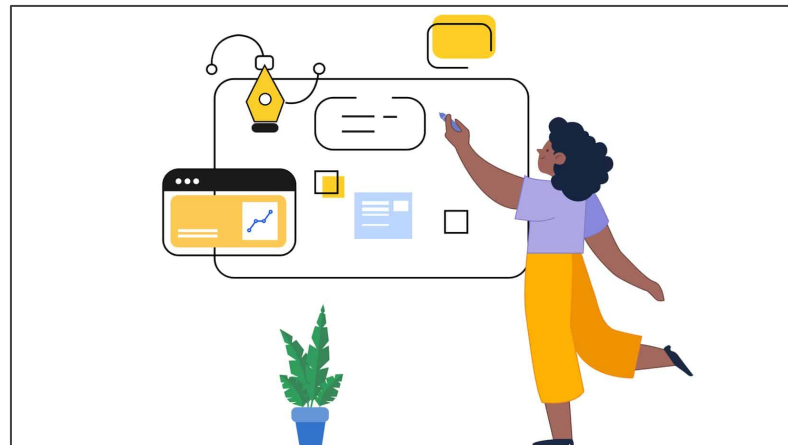
Business Problem

- 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



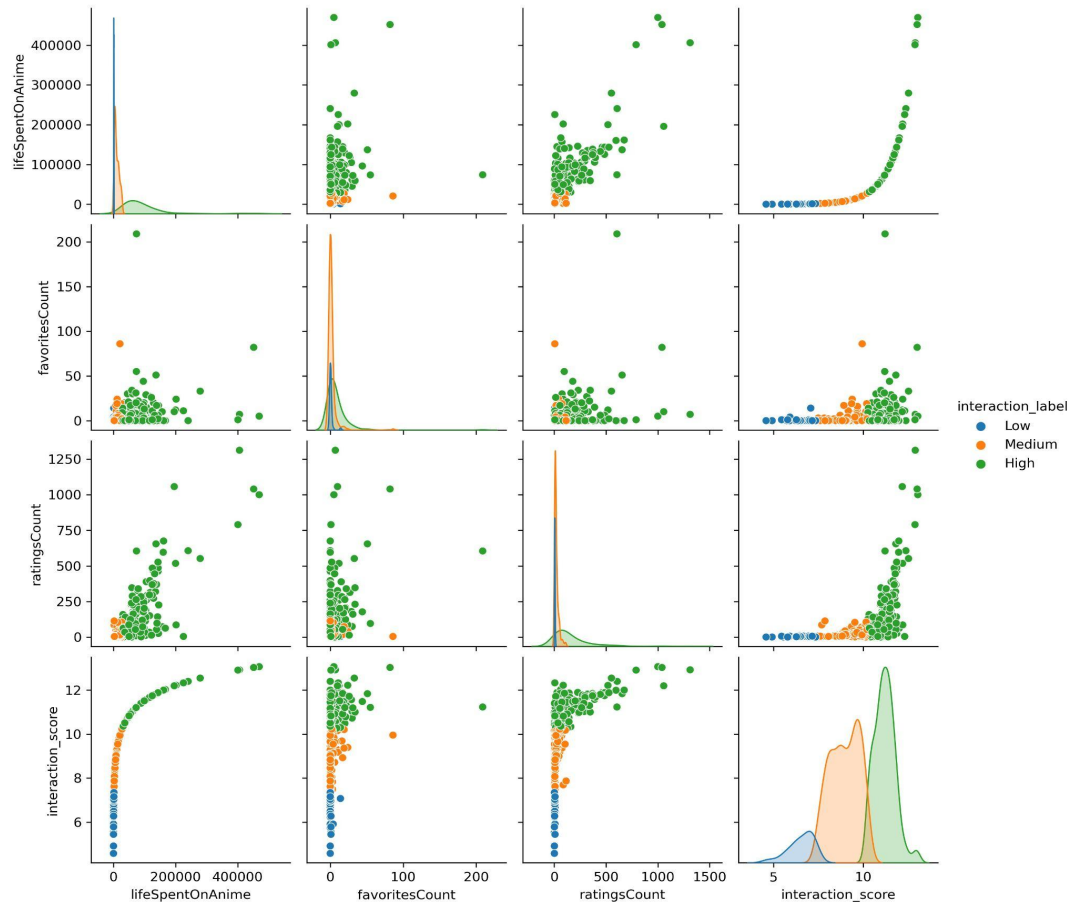
Data & Methods

- Data is query-able from 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



Results - User Segmentation

User Interaction Metrics Pairplot Segmented by Interaction Level



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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**Lupin III vs. Detective
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Psycho-Pass



Mystery / Thriller

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Psycho-Pass

SQUARE ENIX®

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!

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