

Recommendation Systems Overview

- * for producer RS...
 - i) increase user engagement
 - ii) learn more about customers.
 - iii) change user behavior.

* How would you recommend a vacation house to a user.

	□	□	...
1	✓	✓	✓✓
2	✓	✓	✓ -
3		✓	✓
:	✓		✓

← User-item interaction matrix.

* features

property of user?
property of house?

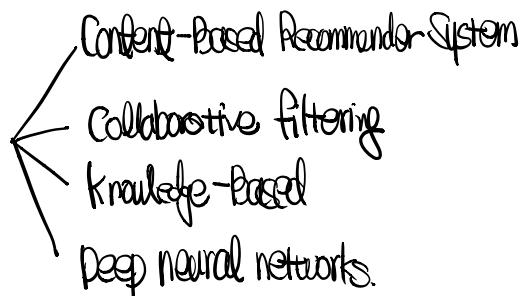
previous rentals of a user.
previous renters of a house.

compare similar users

compare similar items

* targets

rating for unseen properties
next rental properties



Content-based or Collaborative

* Content-based filtering : Uses item features to recommend new items similar to what the user liked in the past.

- impossible to extrapolate how a given user would rank unseen items.

* Collaborative filtering : Use similarity between users & items simultaneously to determine recommendations.

- consider all users & all items and all user item rankings

↳ ... user will like similar items

Similar users will like similar items.

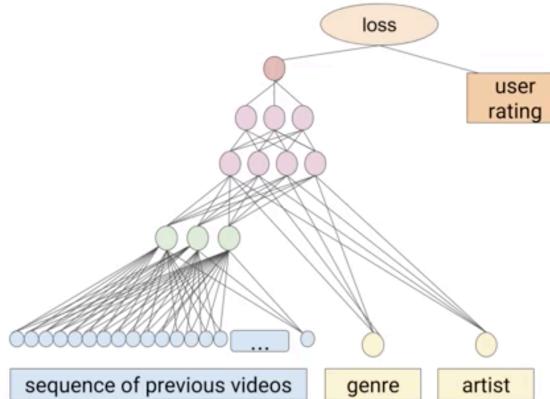
* knowledge-based

Vacation house rental
e.g. 구매한 여행지에 대한 사용자 평가
(not very often 개인사를 이용하는...)

recommendation systems use explicit knowledge about users, items & recommendation criteria.

기준

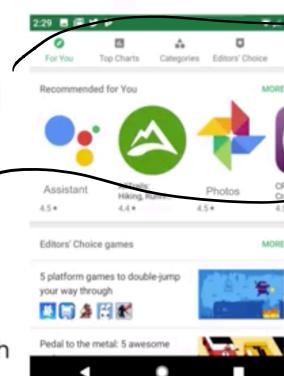
* Deep NN.



Quiz

The model recommends a hiking app to a user because they recently installed a similar app. This is an example of what kind of filtering?

- a) Content-based filtering
- b) Collaborative filtering
- c) Deep neural network
- d) Hybrid approach



이용자시스템

Based only on that user's previous behavior.

유저의 이력

not rely on the behaviors & item interactions of other users.

RS Pitfalls

* The userspace & product space are sparsely skewed.

• sparse ^{very}

i) most items are rated by few users.

ii) most users rate only a small fraction of items.

• skewed ^{비중이 있는}

i) some properties might be very popular.

ii) some users are very prolific. ^{다작인}

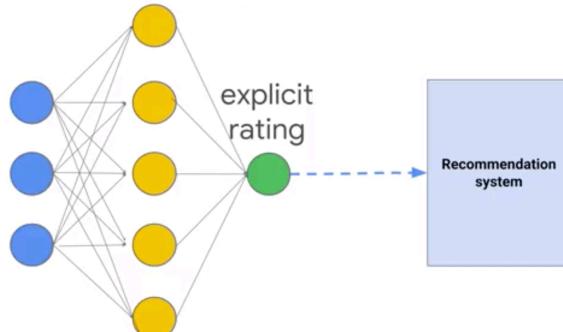
iii) THE COLD START PROBLEM

* Explicit Measurement : like or dislike

Implicit Measurement : # of clicks, play counts, fraction of video watched
time spent page.

Implicit feedback is much more readily available

- # of clicks
- Play counts
- Fraction of video watched
- Site navigation
- Time spent on page



* Quiz.

Which of the following is NOT a problem that can arise when building a recommendation system?

- a) Sparse user-item rating matrix
- b) Not enough user or item interaction information
- c) The user-item rating matrix is heavily skewed
- d) Too much explicit user feedback data to process
- e) Lack of explicit ratings



1. Suppose you want to build a collaborative filter to suggest new hiking trails for users. The problem is you don't have any good explicit user ratings for trails. What feature might be useful for creating an implicit measure of a user's rating for a trail instead?

- The length of the trail
- The distance of the trail to the user's home
- The number of times all users hiked that trail
- The number of times the user hiked that trail

Correct

The decision to hike a trail can be reasonably interpreted as an implicit measure of user preference



2. What are some ways you can address the cold-start problem that can occur for new users of a collaborative filter recommendation system? There could be more than one answer.

- Give up and ask new users to make their own recommendations

Un-selected is correct

- Ask the new user's friends to recommend items they think would be relevant

Un-selected is correct

- Rely on a content-based method instead for new users

Correct

Content-based systems require that we either base our recommendations solely on the properties of the items, by looking for similar items for example, or that we have representations of our users in the same embedding space of our items. For a trivial example, by asking users which genres they prefer, we could make content-based recommendations using representations of items with genres as features.

- Ask the user for some basic preferences

Correct

With only a few preferences, we could classify users into different personas we've derived across our user-base and base our recommendations on the preferences of this entire group