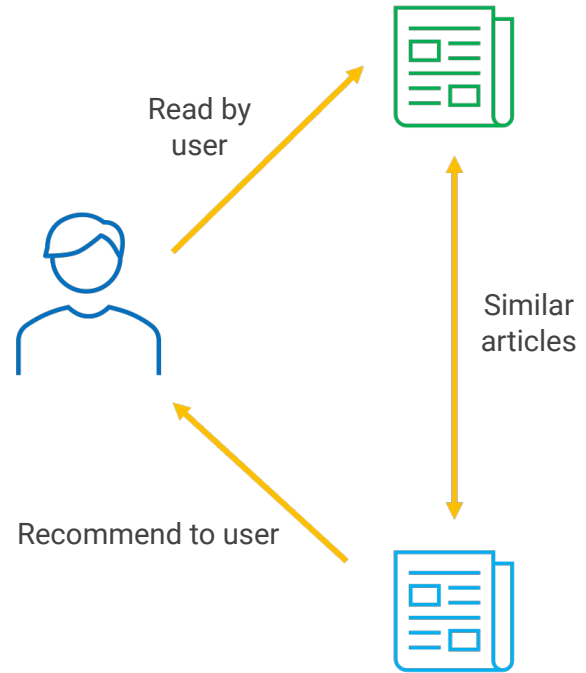# Recommender systems

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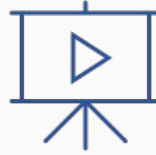
What are the different types of recommender systems?

Content-Based

Recommend items that are similar to what the user likes.

Item features / attributes

Actors, director, genre, tags, description, etc.

Category, tags, text, etc.

Genre, artist, etc.

Item similarity algorithm

User profile algorithm

Movies the user watched and rated:

Movie name	Movie genres	User rating
Batman V Superman	Adventure, Super Hero	2
The Guardians of the Galaxy	Comedy, Adventure, Super Hero, Sci-Fi	10
Captain America: Civil War	Comedy, Super Hero	8

Movies we want to recommend to the user from:

Movie name	Movie genres
Hitchhiker's guide to the galaxy	Comedy, Adventure, Sci-Fi
Batman begins	Super Hero
Spiderman	Comedy, Super Hero, Romance

Source

1 - Model items according to relevant attributes

- For each item, create a profile using its relevant attributes.
- A profile is a descriptor that contains a set of features about the item.

Movie profile	Adventure	Super Hero	Comedy	Sci-Fi
Batman V Superman	1	1	0	0
The Guardians of the Galaxy	1	1	1	1
Captain America: Civil War	0	1	1	0

- Use the items the user previously rated to infer his preferences (profile)

Movie profile	Adventure	Super Hero	Comedy	Sci-Fi
Batman V Superman	1	1	0	0
The Guardians of the Galaxy	1	1	1	1
Captain America: Civil War	0	1	1	0

	User rating				
Batman V Superman	2	2	2	0	0
The Guardians of the Galaxy	10	10	10	10	10
Captain America: Civil War	8	0	8	8	0

2 - Model the user preferences using his previous ratings

	Adventure	Super Hero	Comedy	Sci-Fi
Batman V Superman	2	2	0	0
The Guardians of the Galaxy	10	10	10	10
Captain America: Civil War	0	8	8	0
User profile	4	6.67	6	3.34

Movie genres	Adventure	Super Hero	Comedy	Sci-Fi
Score	-0.63	1.05	0.63	-1.04

How to compute the user ratings for the new items?

3 - Determine the user's interest in items

- For each item, create a profile using its relevant attributes.

Movie profile	Adventure	Super Hero	Comedy	Sci-Fi
Hitchhiker's guide to the galaxy	1	0	1	1
Batman begins	0	1	0	0
Spiderman	0	1	1	0

3 - Determine the user's interest in items

- For each item, create a profile using its relevant attributes.

	Hitchhiker's guide to the galaxy	Batman begins	Spiderman
Adventure	1	0	0
Super Hero	0	1	1
Comedy	1	0	1
Sci-Fi	1	0	0

User profile	4	6.67	6	3.34		13.34	6.67	10.01

Advantages and disadvantages

➜ Able to recommend to users with unique tastes

➜ No item cold-start problem

➜ Interpretable

➜ Finding the appropriate features is hard

➜ Never recommends item's outside of the user's known interests

➜ User cold-start problem