



# Recommender Systems: Collaborative & Content-based Filtering Features

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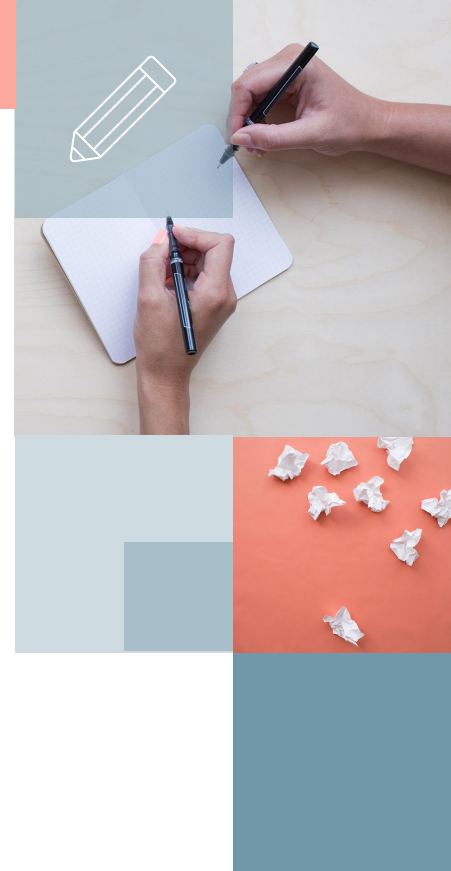




# Collaborative Filtering

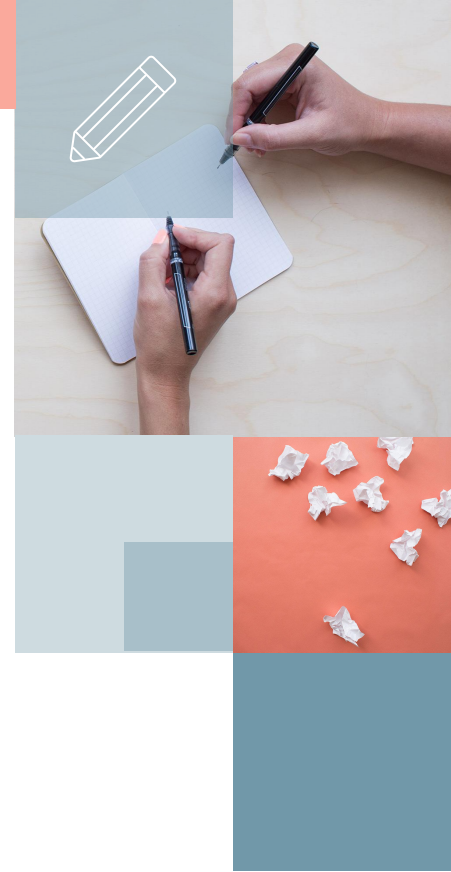
# Collaborative Filtering Use cases

- When users are actively rating items
- When there is no information available on items
- When there is no information available on users' profiles
- When system has less sparsity
- When the neighbours do not change quickly
- When system does not consider temporal statuses
- When items are frequently purchased or rated



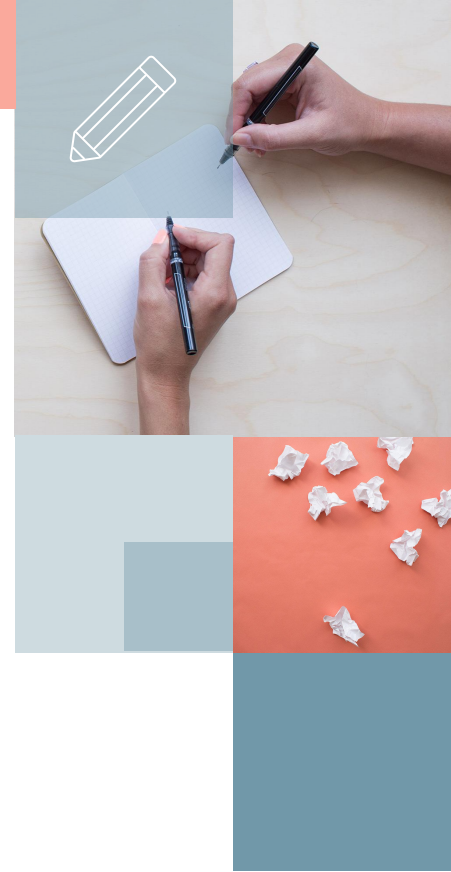
# Collaborative Filtering Advantages

- Easy to implement
- Extensively applied and in use in businesses
- No requirement to know about users or items
- Can be applied for any types of items (Videos, Audios, etc.)
- Serendipity



# Collaborative Filtering Disadvantages

- Cold-start problem
- On sparse matrix performance is quite weak
- Taking into consideration temporal states of users added much complexity with little outcome
- Grey sheep problem

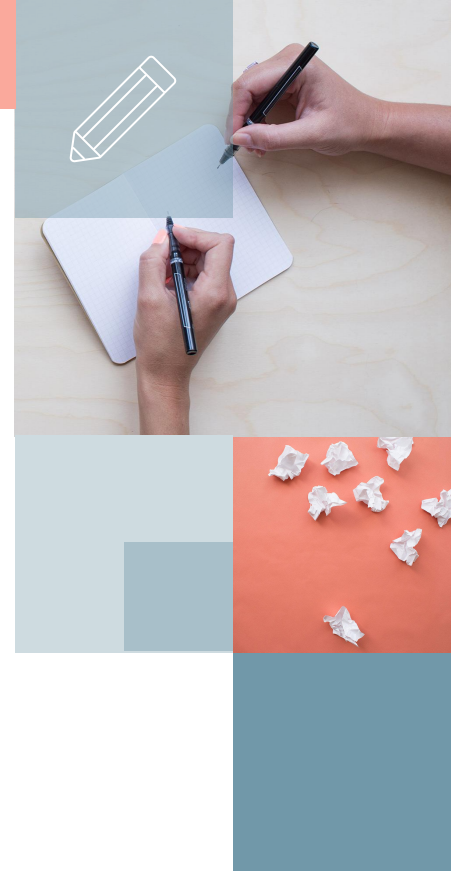




# Content-based Filtering

# Content-based Filtering Use cases

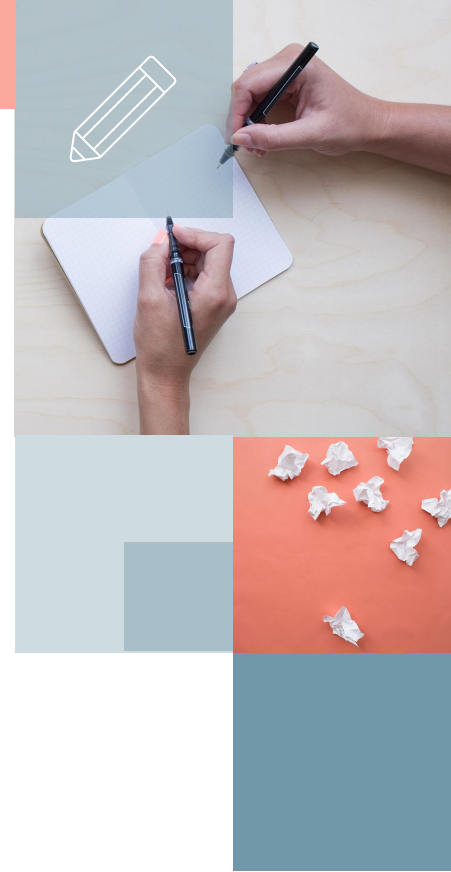
- Suitable for text-based data
- Extensively in use in field of NLP, Sentiment analysis
- Easy to accommodate users temporal and long term statuses
- Does not have cold start problem
- Does not require many users' ratings (sparse matrix is not an issue)
- Poor performance when there is not enough data about users and items





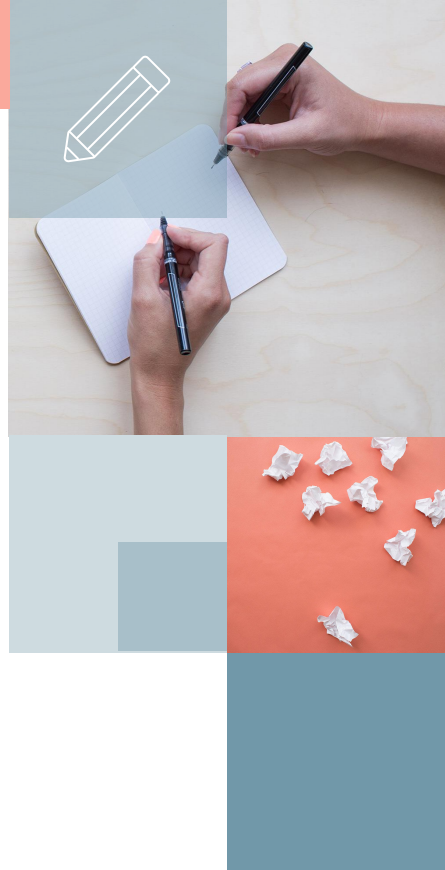
# Content-based Filtering Advantages


- Suitable to leverage when the user profilings and item descriptions available
- Extensively studies in IF, IR, NLP, Sentiment analysis, hence many algorithms can be utilized
- Does not require many users ratings since rating is calculated from users' profile and items
- Does not suffer from cold start problem
- Does not suffer from matrix sparsity
- Easy to accommodate temporal and long term preferences



# Content-based Filtering Disadvantages

- Required feature rich items descriptions and user profilings
- Not very suitable for non-textual entities
- Does not have serendipity effects (repetitive recommendations or overfitting)
- Some challenges in choosing the most suitable algorithms

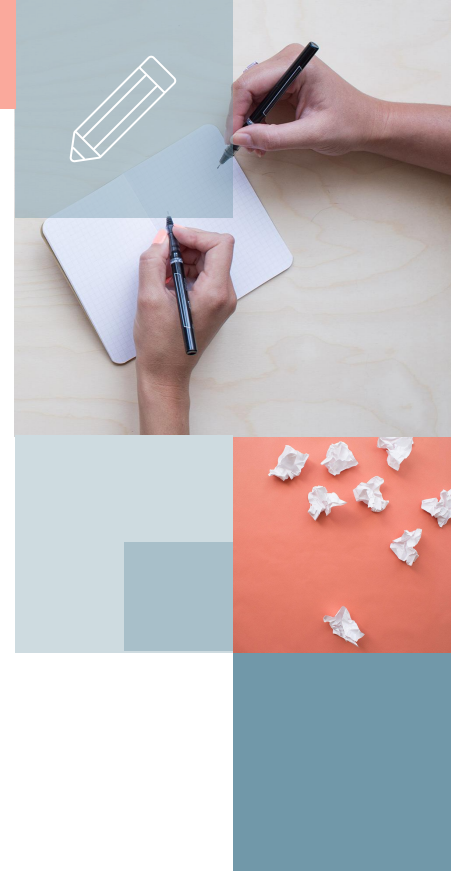




# Recommender Systems Algorithms

# Some Recommender Systems Algorithms

- Heuristics (Cosine Similarity, Pearson Coefficient, TF-IDF, Word count, Bag-of-words, Pagerank)
- Text mining algorithms (k-Means, Apriori, etc.)
- Machine learning
  - Supervised (Classification, SVM)
  - Semi supervised
  - Unsupervised (Clustering, NN)
  - Reinforcement learning



Thanks!

**Any** questions?

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