Types: Collaborative filtering-based, Content-based, Knowledge-based, Graph-based, Hybrid

Challenges (with importance level):

- (High) **Cold-start issue:** handle new users or items that have no rating data.
  - GHRS model
- (Normal) **Online training:** update the model based on new ratings.
  - paper #ToRead
- (High) **Trend items:** consider an advantage for new and trending items.
- (Normal) **Overspecialization:** suggest diverse and surprising items.
- (Low) **Predictability:** suggest fresh items that user haven't seen.
- (Low) **Real-time:** handle real-time changes in user's preference (mostly for suggesting similar items based on user info).
  - medium article #ToRead
- (Low) **Interactive learning:** update the model based on user's interest in the model's suggestions.
  - bandits article

Similar Items Recommendation

weighted feature cosine similarity, can train weights offline or online (bandits article)

Simple starting library with baseline methods (https://github.com/NicolasHug/Surprise)

List of RS (open-source, research, benchmarks)
(https://github.com/grahamjenson/list_of_recommender_systems)

PredictionIO (https://github.com/apache/predictionio) (Abandoned)

- Similar products service (based on item categories and user views)
- E-commerce RS

Papers (https://github.com/hongleizhang/RSPapers)

Microsoft repository (https://github.com/microsoft/recommenders)

Algo	MAP	nDCG@k	Precision@k	Recall@k	RMSE	MAE	R^2	Explained Variance
ALS	0.004732	0.044239	0.048462	0.017796	0.965038	0.753001	0.255647	0.251648
BiVAE	0.146126	0.475077	0.411771	0.219145	N/A	N/A	N/A	N/A
BPR	0.132478	0.441997	0.388229	0.212522	N/A	N/A	N/A	N/A
FastAI	0.025503	0.147866	0.130329	0.053824	0.943084	0.744337	0.285308	0.287671
LightGCN	0.088526	0.419846	0.379626	0.144336	N/A	N/A	N/A	N/A
NCF	0.107720	0.396118	0.347296	0.180775	N/A	N/A	N/A	N/A
SAR	0.110591	0.382461	0.330753	0.176385	1.253805	1.048484	-0.569363	0.030474
SVD	0.012873	0.095930	0.091198	0.032783	0.938681	0.742690	0.291967	0.291971

BiVAE:

- https://github.com/PreferredAI/bi-vae
- https://github.com/microsoft/recommenders/blob/main/examples/02_model_collaborative_filtering/cornac_bivae_deep_dive.ipynb

MovieLens 1M benchmark (https://paperswithcode.com/sota/collaborative-filtering-on-movielens-1m)

GLocal-K:

- https://github.com/usydnlp/Glocal_K

Graph-based hybrid RS:

- https://github.com/hadoov/GHRS

IMC-GAE (graph autoencoder):

- https://github.com/swtheing/imc-gae

Amazon product data (score, review, product metadata)
(https://paperswithcode.com/dataset/amazon-product-data)