

Pattern Mining	Compare Algorithms				
	Model	FP-Growth	Collaborative Filtering	Matrix Factorization (by LightFM)	Neural Recommendation (by Spotlight)
	Type	Pattern Mining Algorithm	Recommendation Model	Recommendation Model	Recommendation Model
	Architecture	Tree-based (FP-Tree) structure for finding frequent itemsets	Memory-based computes the similarity between users or items / Model-based compresses user-item matrix into a low-dimensional representation in terms of latent factors	Hybrid model which learns from interaction data (collaborative filtering) and feature data (content-based filtering)	Built on PyTorch, supports various architectures (Factorization, Sequential models)
	Speed	Very fast for frequent itemset mining	Varies by algorithm; SVD is fast; KNN can be slow for large dataset	Fast, optimized for sparse data.	Varies by model and hardware; can be GPU-accelerated
	Accuracy	Not a predictive model; measures association (support, confidence, lift).	High for explicit feedback data (e.g., ratings) using matrix factorization methods, but fails at cold-start	High, especially in sparse data and cold-start scenarios due to its hybrid nature.	Potentially high, depends on the specific model and tuning
	Best For	Market Basket Analysis ("Customers who bought X also bought Y").	Prototyping and comparing standard collaborative filtering algorithms on explicit rating data.	Large dataset, real-world systems with implicit feedback and user/item metadata (cold-start problem).	Large dataset, real-world systems with implicit feedback where order matters
	Limitations	Only finds co-occurrence patterns, doesn't create personalized user profiles.	Primarily designed for explicit user-item-rating data; less effective for implicit feedback or cold-start scenarios.	Can be more complex to implement due to the need for feature engineering.	Requires tuning of deep learning models; less interpretable; more complex to deploy
	Corresponding Package	mlxtend	Surprise	LightFM	Spotlight
	TL;DR				
	If you want to know how often two products are chosen simultaneously, FP-Growth				
	If you want to predict explicit ratings, Collaborative Filtering by Surprise				
	If you want to predict implicit links or deal with cold-start scenarios, LightFM				
If you want to predict next item after a sequence for arbitrary user, Spotlight					