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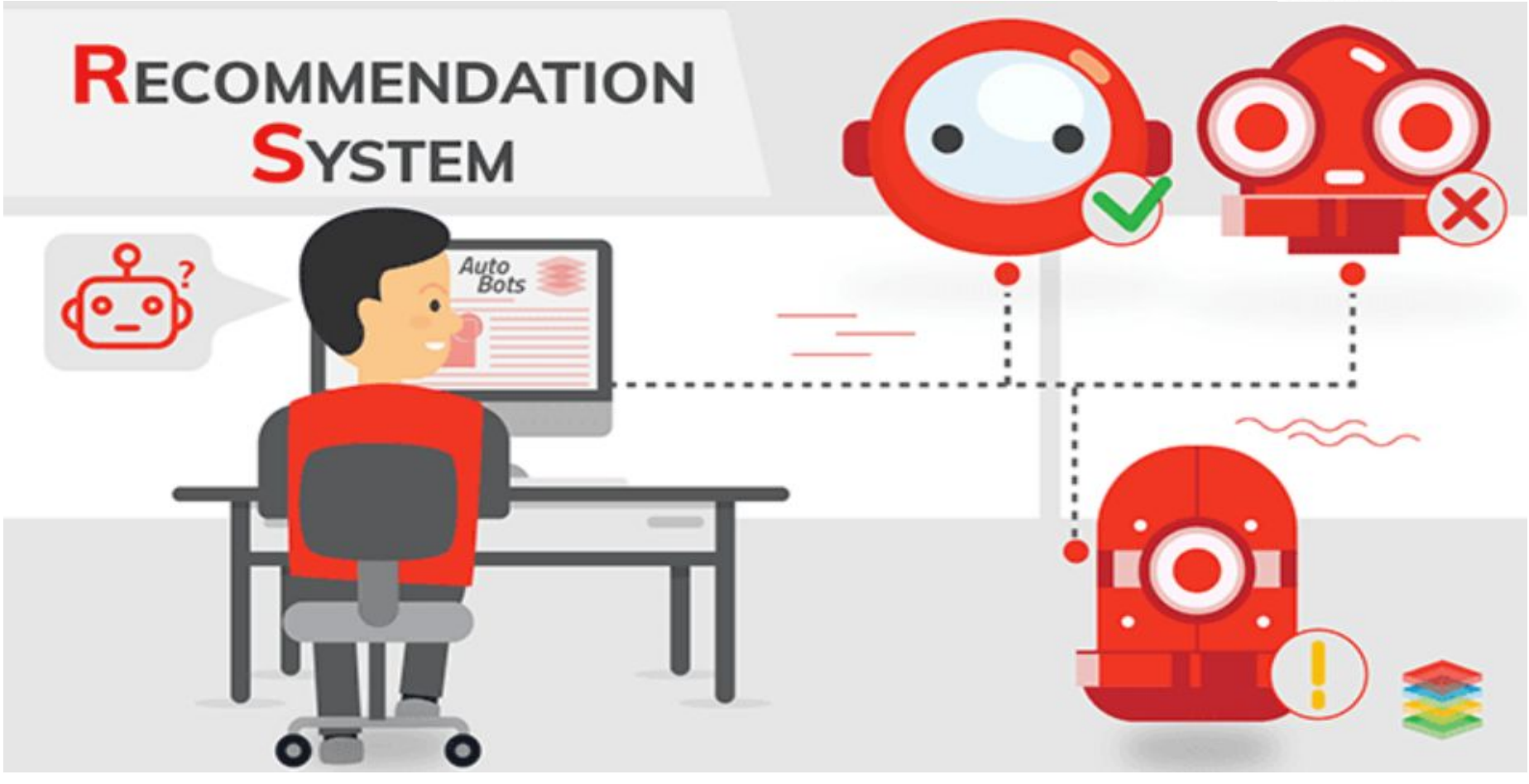
Skill Up. Level Up

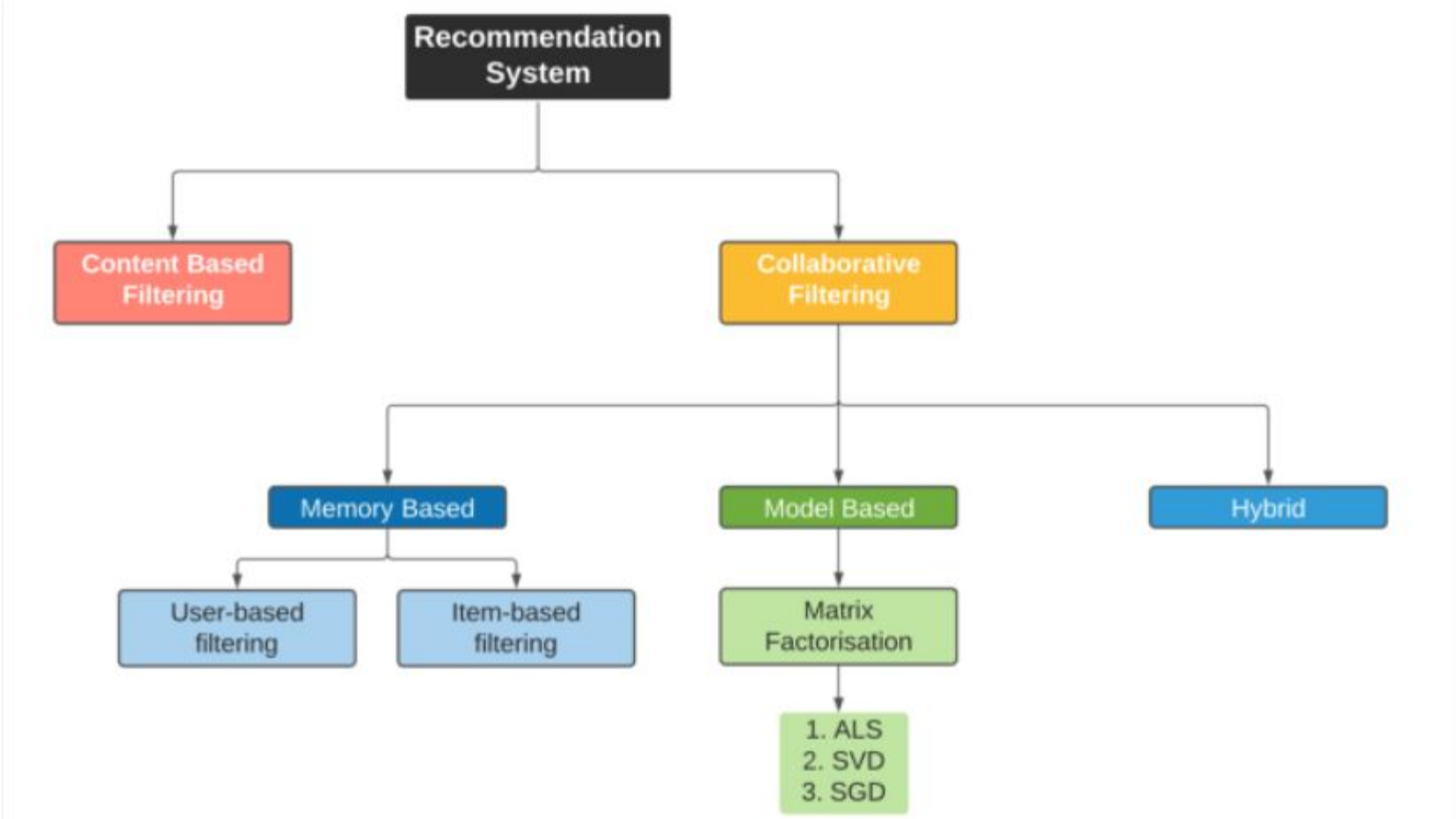


What is a Recommendation System?

A recommender system is like a personal assistant that:

- Learns your preferences
- Suggests items you'll enjoy
- Personalizes your experience based on behavior and preferences


Movies and Multimedia
Tourist Locations
OTT Platforms
Telecom
E-Commerce
Banking & Retail
Education
Food & Beverages
Applications of Recommendation Systems


Recommendation System
Content Based Filtering
Collaborative Filtering
Memory Based
Model Based
Hybrid
User-based filtering
Item-based filtering
Matrix Factorisation
1. ALS
2. SVD
3. SGD

Types of Recommendation Systems

Type	Basis	Example
Collaborative	User behavior	Netflix, Amazon
Content-Based	Item features	Spotify “Discover Weekly”
Clustering-Based	User/item segmentation	E-commerce filters
Hybrid	Mix of above	YouTube, LinkedIn

Content-Based Filtering

The content based filtering model captures the feedback and previous actions of a user and recommends new similar products to them.

Similarity Techniques:

- Cosine Similarity: For TF-IDF or numeric feature vectors
- Euclidean Distance: When the magnitude of feature values matters
- Jaccard Similarity: For tags or sets (genres, categories)

Real-World Examples:

- **Books (Goodreads):** Recommend books based on genre, author, theme
- **E-Commerce (Amazon):** Suggest products with similar features

When to Use:

- When you have rich metadata
- Cold-start problems (new users)

Collaborative Based Filtering

Recommends items based on the preferences of similar users (user-user or item-item).

Similarity Techniques:

- Cosine Similarity: Compares users or items based on interaction patterns
- Pearson Correlation: Handles varying rating scales
- Matrix Factorization (SVD/ALS): Captures latent patterns in large datasets

Real-World Examples:

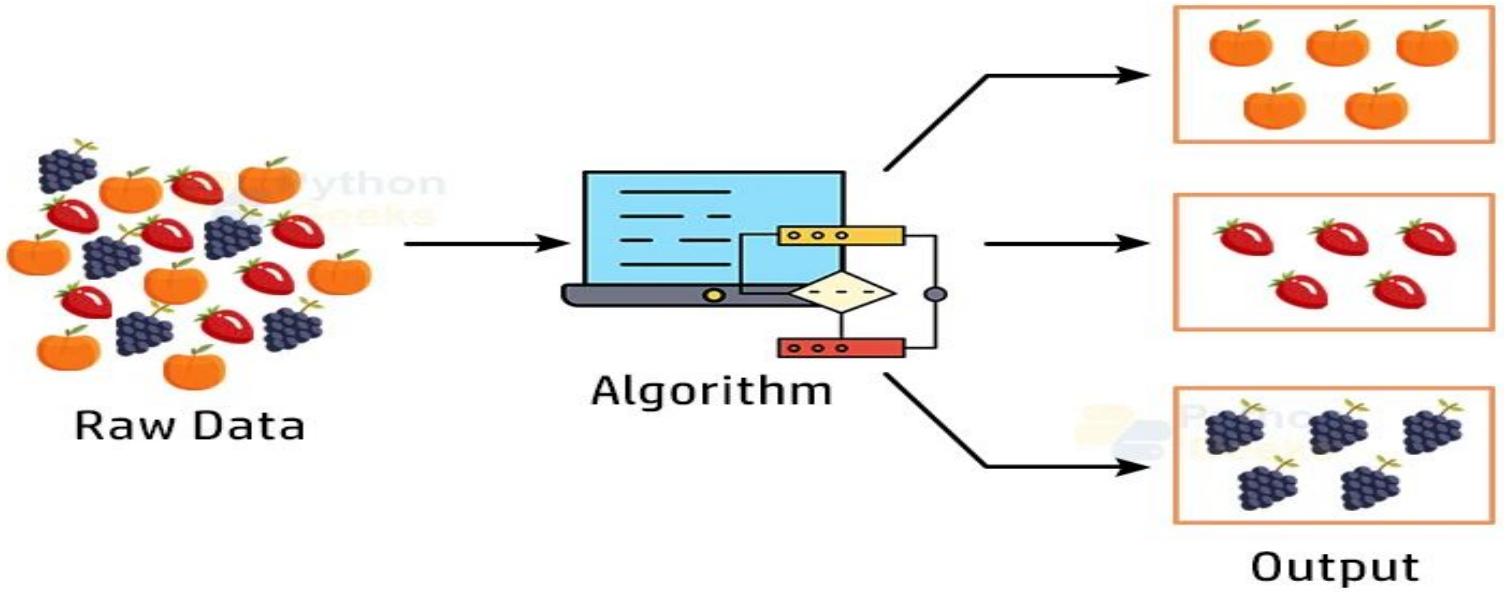
- **Movies (Netflix):** Users with similar watch history
- **Job Portals (LinkedIn):** Users who applied for similar jobs

When to Use:

- When there is enough user-item interaction data
- For personalized, behavior-based recommendations

Clustering-Based Recommendation System

Clustering-based recommender systems group users or items into **clusters** based on their similarities. Recommendations are made by analyzing the preferences within each cluster.



Similarity Techniques:

- Euclidean Distance: Used in clustering algorithms like KMeans
- Cosine Similarity: Used post-clustering to fine-tune recommendations

Real-World Examples:

- **Food Delivery (Zomato):** Cluster restaurants based on cuisine, price, and ratings
- **Product Segmentation (Flipkart):** Group similar products for campaign targeting

When to Use:

- When dataset is large and needs simplification
- To create scalable and interpretable groups

Hybrid Recommendation System

Combines two or more techniques (e.g., content-based + collaborative) to improve accuracy and flexibility.

Techniques Used:

- Weighted Hybrid: Combine scores from multiple methods
- Switching Hybrid: Choose method based on user/item context
- Ensemble Hybrid: Combine multiple models (e.g., via voting)

Real-World Examples:

- **Social Media (Facebook):** Combines friends' activity + content interest + network graphs
- **Healthcare (Insurance Plans):** Combines patient data and collaborative plan selection

When to Use:

- To overcome cold start and sparsity problems
- To balance accuracy, diversity, and personalization