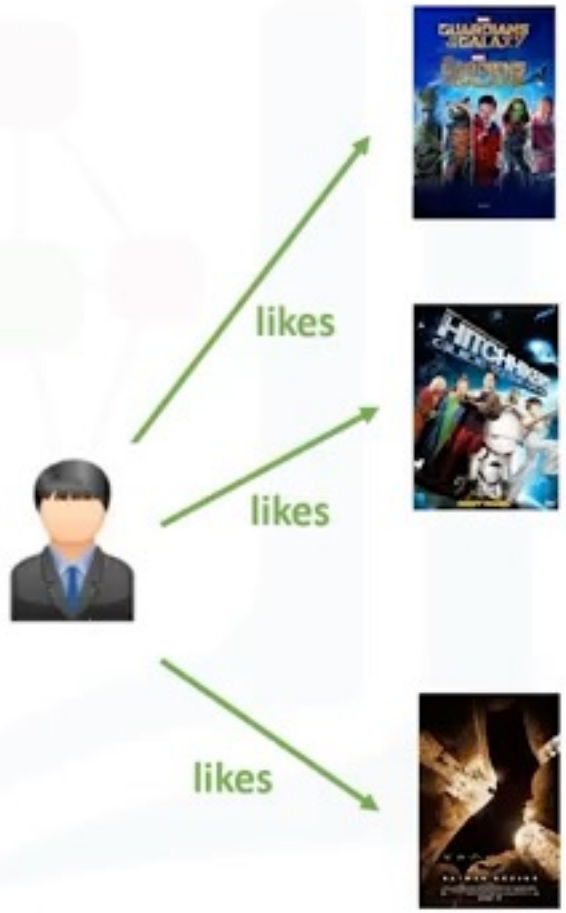
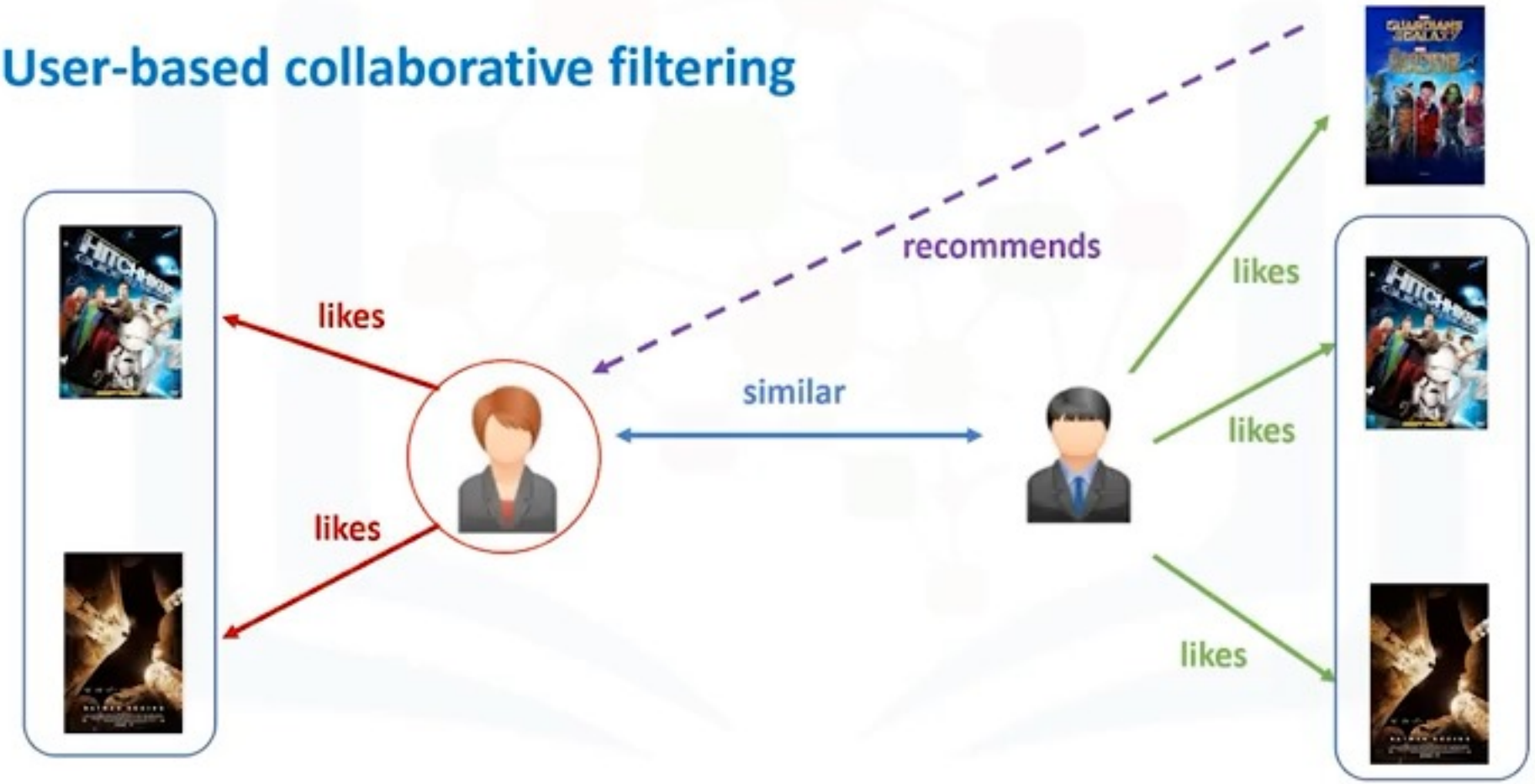
Collaborative filtering

- **User-based collaborative filtering**
  - Based on users' neighborhood
- **Item-based collaborative filtering**
  - Based on items' similarity



Collaborative filtering

- **User-based collaborative filtering**



User ratings matrix

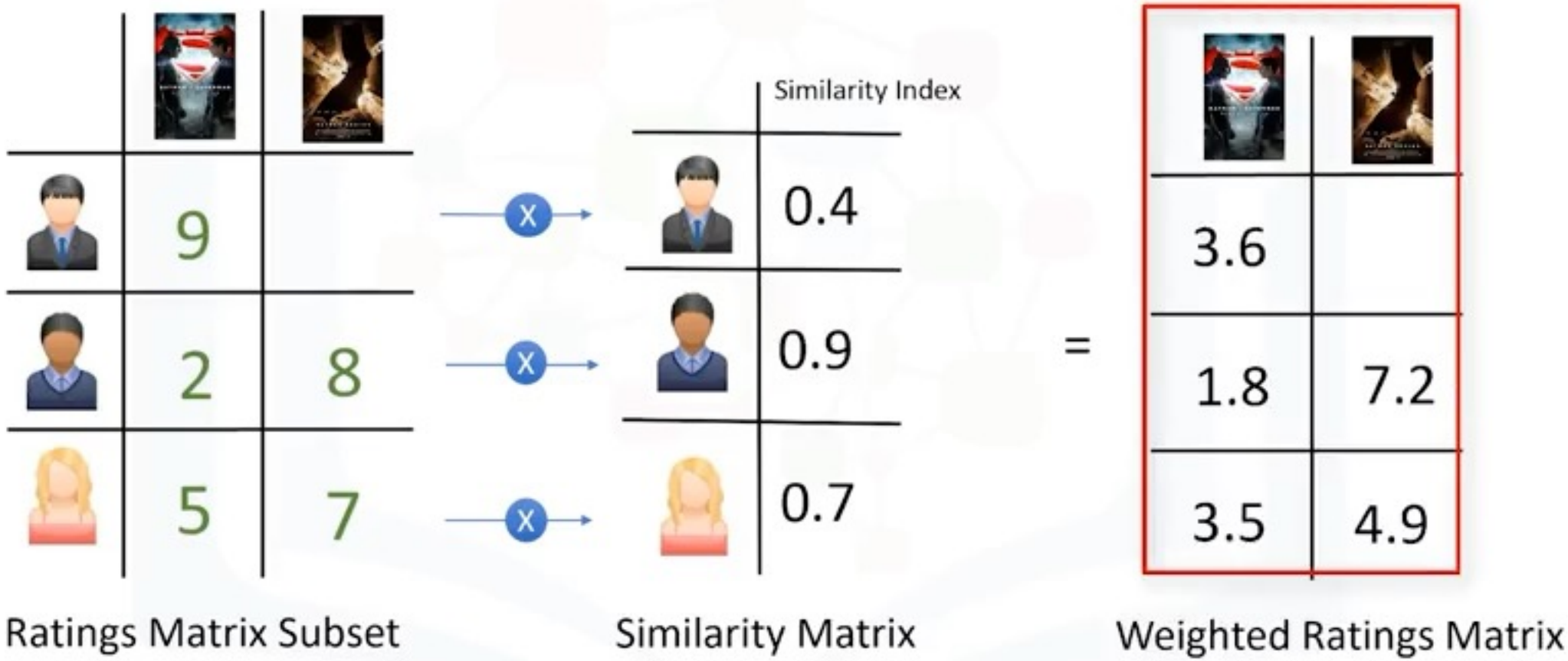
	9	6	8	4	
	2	10	6		8
	5	9		10	7
Active user		10	7	8	

Ratings Matrix

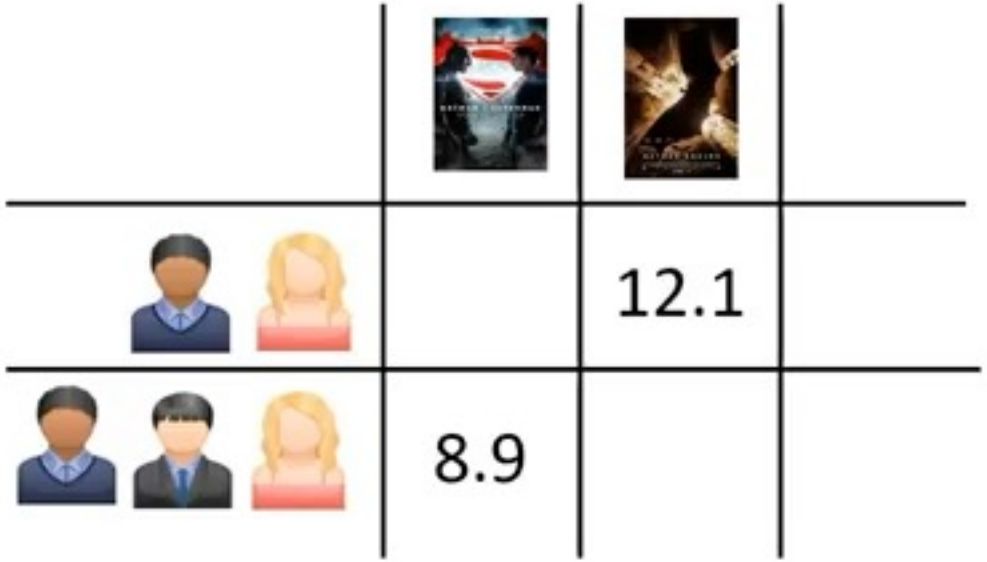
Learning the similarity weights

Ratings Matrix

Creating the weighted ratings matrix

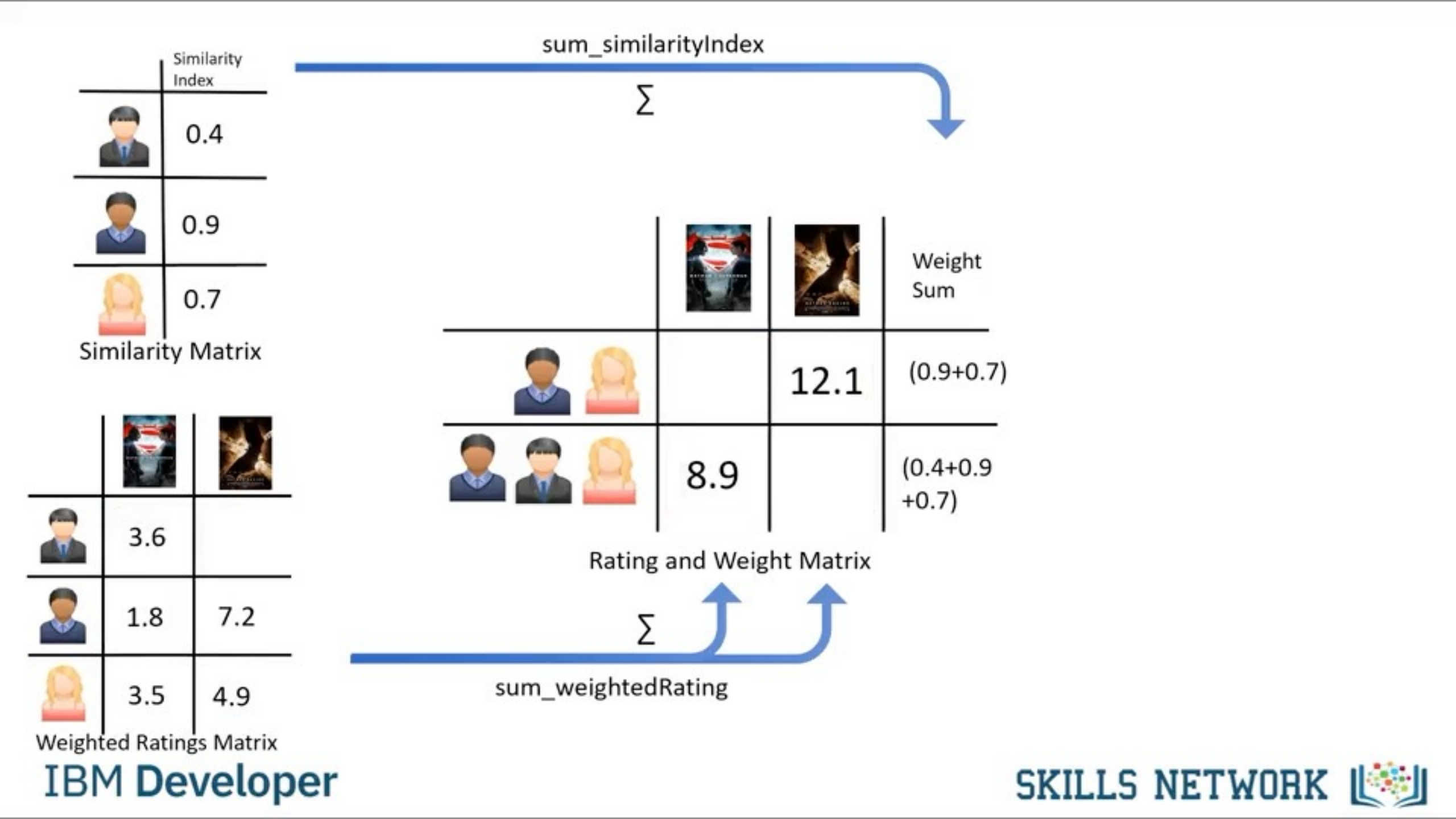


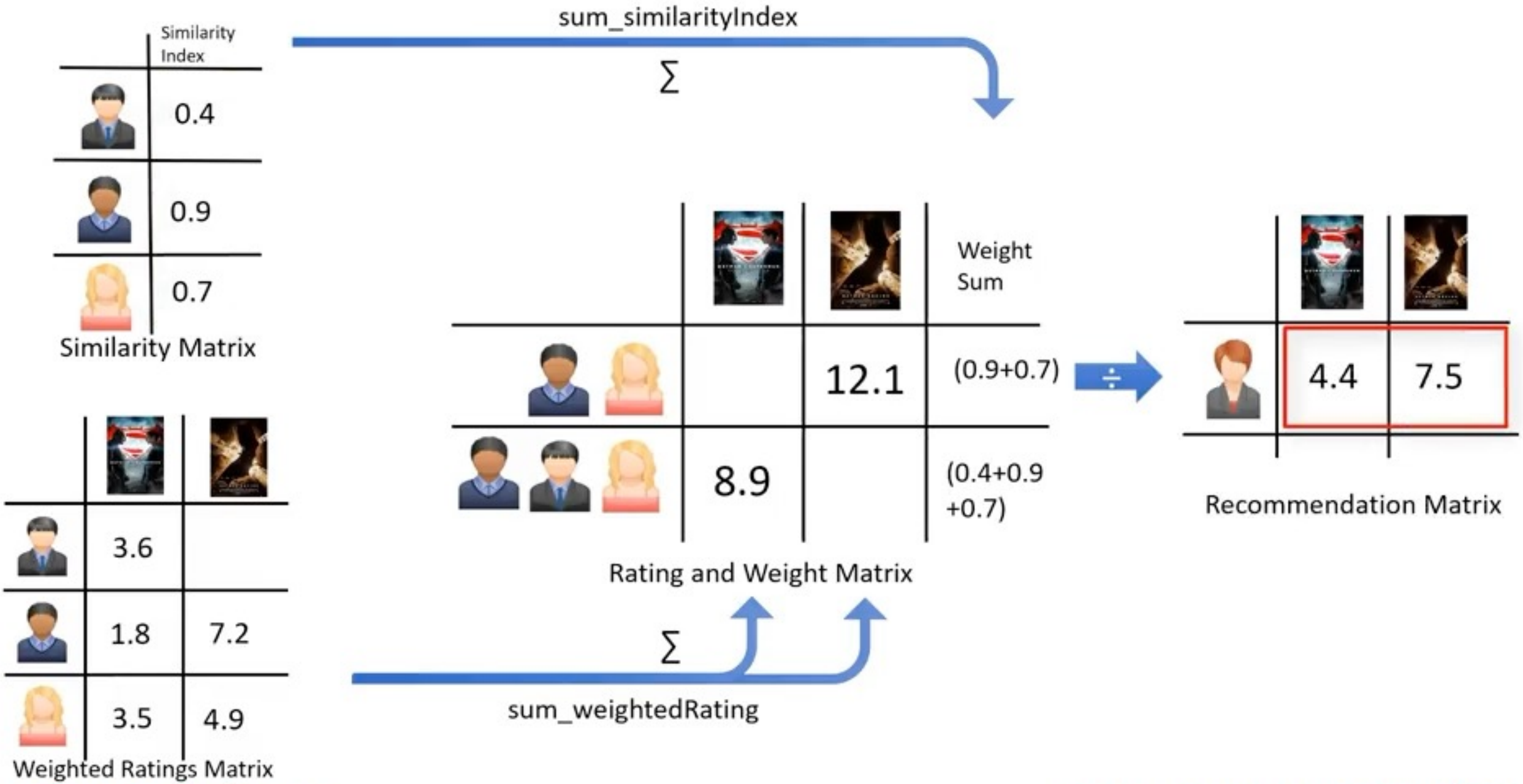
Weighted Ratings Matrix



Rating and Weight Matrix

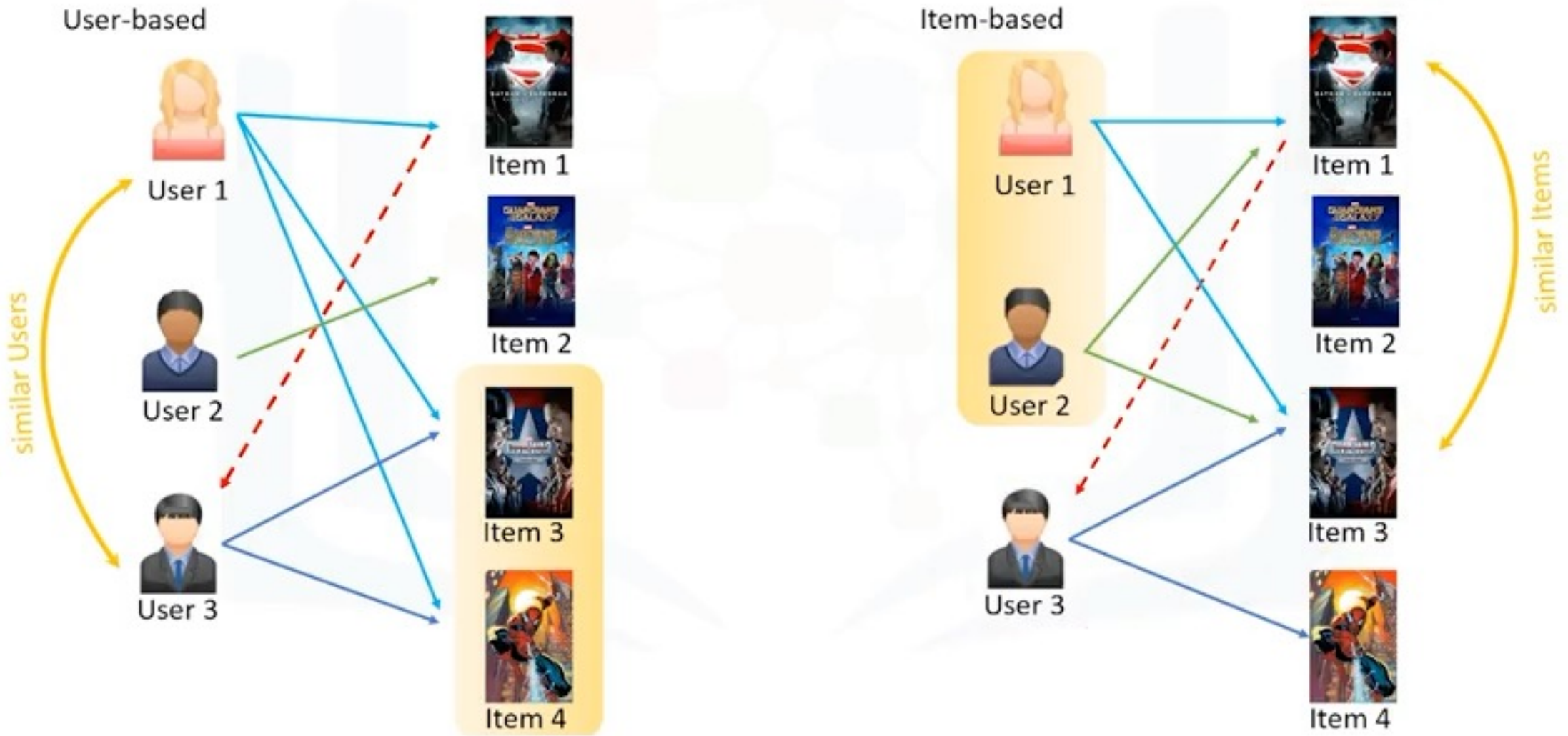
sum_weightedRating


sum_similarityIndex
Σ
Similarity Index
0.4
0.9
0.7
Similarity Matrix
Weight Sum
12.1
(0.9+0.7)
8.9
(0.4+0.9 +0.7)
Rating and Weight Matrix
Σ
sum_weightedRating
3.6
1.8
7.2
3.5
4.9
Weighted Ratings Matrix



IBM Developer
SKILLS NETWORK

Collaborative filtering



Challenges of collaborative filtering

- **Data Sparsity**
  - Users in general rate only a limited number of items
- **Cold start**
  - Difficulty in recommendation to new users or new items
- **Scalability**
  - Increase in number of users or items