

➤ Big Data Tutorial Assignment 8

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➤ **Assignment 8**

Recall

Based on his data which series would you recommend to Anna?
Explain your solution

User/Series	Game of thrones	Stranger things	Black mirror	Black list	The Boys
Mark	5	4		5	
Alex	3	4	5		
Anna		5		5	
Kate	5			1	4

Recall

Based on his data which series would you recommend to Anna?
Explain your solution

User/Series	Game of thrones	Stranger things	Black mirror	Black list	The Boys
Mark	5	4		5	
Alex	3	4	5		
Anna		5		5	
Kate	5			1	4

Anna has similar taste with Mark. And Mark has given Game of thrones the rating of 5. So, we should probably recommend GoT to Anna.

Recall

Predict the rating given by user u_3 to item i_4

- with user-based recommendation.
Note: A user is similar to u_3 , when there are at least two ratings with difference ≤ 1
- with item-based recommendation
An item is similar to i_4 , when there are at least two ratings with a difference ≤ 1

	i_1	i_2	i_3	i_4	i_5	i_6
u_1	4	5		3		4
u_2	5				2	5
u_3		5	5	?	5	1
u_4			4		3	2
u_5	5	4			4	
u_6	4		1	5	5	

Recall

User-based recommendation.

	i ₁	i ₂	i ₃	i ₄	i ₅	i ₆
u ₁	4	5		3		4
u ₂	5				2	5
u ₃		5	5	?	5	1
u ₄			4		3	2
u ₅	5	4			4	
u ₆	4		1	5	5	

U4 and U5 are similar to U3.

But does it help us? none of them rated the i₄. So what now?

item-based recommendation

	i ₁	i ₂	i ₃	i ₄	i ₅	i ₆
u ₁	4	5		3		4
u ₂	5				2	5
u ₃		5	5	?	5	1
u ₄			4		3	2
u ₅	5	4			4	
u ₆	4		1	5	5	

I1 is similar to I4, but there is not rating from u3

Recall

Let's try with another table, just to practice together

	i_1	i_2	i_3	i_4	i_5	i_6
u_1	4		1	3		4
u_2	5				2	5
u_3	5	5	3	?	5	1
u_4			4	5	3	1
u_5	5	4		3	4	
u_6	4		1	5	5	

Recall

User-based recommendation

	i ₁	i ₂	i ₃	i ₄	i ₅	i ₆
u ₁	4		1	3		4
u ₂	5				2	5
u ₃	5	5	3	?	5	1
u ₄			4	5	3	1
u ₅	5	4		2	4	
u ₆	4		1	5	5	

u₄, u₅, u₆ are similar to u₃:

Predicted rating from u₃ to i₄ = $1/3 * (3+4+5)=4$

Item-based recommendation

	i ₁	i ₂	i ₃	i ₄	i ₅	i ₆
u ₁	4		1	3		4
u ₂	5				2	5
u ₃	5	5	3	?	5	1
u ₄			4	5	3	1
u ₅	5	4		3	4	
u ₆	4		1	5	5	

i₁ and i₅ are similar.

Predicted rating from u₃ to i₄ = 5

Recall

RMSE

You are given the table with ratings. Part of the ratings were predicted. Your task is to calculate RMSE based on this data

$$RMSE = \sqrt{\sum_{i=1}^n \frac{(\hat{y}_i - y_i)^2}{n}}$$

User/Series	Game of thrones	Stranger things	Black mirror	Black list	The Boys
Mark	5	4	5(3)	5	5(5)
Alex	3	4	5	3(2)	3(3)
Anna	4(1)	5	4(1)	5	5(4)
Kate	5	4(4)	4(4)	1	4

Recall

$$\sqrt{\frac{(4-1)^2 + (4-4)^2 + (4-1)^2 + (4-4)^2 + (5-3)^2 + (3-2)^2 + (5-5)^2 + (3-3)^2 + (5-4)^2}{9}}$$
$$= \sqrt{\frac{9+9+4+1+1}{9}} = \sqrt{\frac{23}{9}} \approx 1,6$$

User/Series	Game of thrones	Stranger things	Black mirror	Black list	The Boys
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Alex	3	4	5	3(2)	3(3)
Anna	4(1)	5	4(1)	5	5(4)
Kate	5	4(4)	4(4)	1	4

KNN vs Neural Networks

Based on further reading materials what appeared to be more efficient for recommendation systems, KNN or Neural Networks? Why?

It appears that KNN approach performed better than the neural network based methods in predicting the user's interested product.
This is because KNN algorithm by nature focuses on the similar users.

Knowledge Questions

Explicit and implicit ratings

Explain the difference between explicit and implicit ratings.
Use further reading and external sources.

Explicit rating - the user directly provides ratings about an item
Implicit rating

Q&A



➤ That's all, folks!