

Recommender Systems: Exam

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Questions (1)

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- 1 Ch 1 What is the difference between collaborative filtering approach and community-based recommender systems. Describe the novel opportunities offered by community-based approach.
- 2 Ch 2 Given the following annotated dataset classify the items according to K-NN method ($k=3$, distance=Euclidean). Dataset: $(2, 2, A)$, $(4, 2, A)$, $(5, 3, C)$, $(3, 4, A)$, $(6, 4, C)$, $(6, 5, B)$, $(5, 7, C)$, $(7, 7, B)$, $(8, 6, B)$. Items: X — $(5, 5)$, Y — $(4, 6)$, Z — $(3, 3)$
- 3 Ch 2 Using 2-means clustering algorithm the two clusters were obtained: $(0, 0)$, $(0, 10)$ and $(10, 0)$, $(10, 10)$. Draw the possible area of initial seed position for the first seed. Provide short description of the solution.
- 4 Ch 3 Suppose that you are developing a content-based system for book recommendation. Propose semantic-based enhancements and describe their usage in detail.

Questions (2)

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- 5 Ch 4 Describe the idea of Inverse User Frequency. Whats the motivation for employing it?
- 6 Ch 4 Provide several examples of user pairs, where horting relation **holds**. Provide several examples where it does **not holds**. Explain.

user item	I_1	I_2	I_3	I_4	I_5
U_1		5		3	4
U_2	5			2	
U_3		3			
U_4			2	1	
U_5	5	4	2		2

$$\alpha = 2.0, \beta = 0.35$$

Questions (3)

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7 Ch 6 Given the following product set and the following set of filtering conditions, propose minimal relaxation. Select the best one and provide justification. Products:

$P_1 : f_1 = 100; f_2 = 199; f_3 = 21; f_4 = 15; f_5 = 20$

$P_2 : f_1 = 15; f_2 = 15; f_3 = 1; f_4 = 80; f_5 = 30$

$P_3 : f_1 = 72; f_2 = 30; f_3 = 30; f_4 = 18; f_5 = 40$

$P_4 : f_1 = 33; f_2 = 9000; f_3 = 40; f_4 = 5; f_5 = 50$

$P_5 : f_1 = 10; f_2 = 13; f_3 = 50; f_4 = 35; f_5 = 60$

Filtering conditions:

$CF_1 : (f_3 \neq 1) \vee (f_1 > 11) \vee (f_1 < 11)$

$CF_2 : (f_2 < 150)$

$CF_3 : (f_4 < 15)$

$CF_4 : (f_1 > 50) \vee (f_1 = f_2) \vee (f_4 < 50 \wedge f_5 > 49)$

Questions (4)

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8 Ch 8 Suppose that you have a very accurate eye-tracking device, which allows to pinpoint even the pixel which the user is looking at. You are using this device to assess the results of a recommender engine. This engine produces ranked list of items with snippets containing short descriptions. Thus, you have a session which contains a set of the following tuples: $(resultid, t_{observationstart}, t_{observationend})$.

Devise a function to compare two recommender engines using their output and sessions.

9 Ch 8 Illustrate the R-Score metric using a detailed example.

Questions (5)

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Ch 15 Suppose that you are designing a structured overview explanations for on-line consumer electronics retailer. The recommender system is build using the collaborative approach. You have a lot of items, each of them has a lot of features, e.g. price, weight, battery life and so on. You have logs containing virtually any possible information of (any) user activity. Your goal is to use them for selecting a small number of relevant features which will be used for presentation.