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## 5. Collaborative Filtering with Matrix Factorization

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Exercises due Mar 8, 2023 08:59 -03 Completed

**Collaborative Filtering with Matrix Factorization****Video** [Download video file](#)**Transcripts** [Download SubRip \(.srt\) file](#) [Download Text \(.txt\) file](#)**Matrix Factorization Practice**

1/1 point (graded)

We now use **collaborative filtering** to solve the movie recommender system problem.

As we saw in the previous problem, we ended up with an unsatisfactory and trivial solution if we optimize the objective alone:

$$J(X) = \sum_{a,i \in D} \frac{(Y_{ai} - X_{ai})^2}{2} + \frac{\lambda}{2} \sum_{(a,i)} X_{ai}^2.$$

In the collaborative filtering approach, we impose an additional constraint on  $X$ :

then what is the minimum possible ?



Submit

You have used 1 of 3 attempts

## Intuition on the Vector Factors

1/1 point (graded)

Assume we have a 3 by 2 matrix  $R$  i.e. we have 3 users and 2 movies. Also,  $u$  is given

for some  $u$  matrix and  $v$  matrix.

Now which of the following is true about  $u$  and  $v$ ? (Choose all those apply.)



The first row of  $u$  represents information on user 1's rating tendency



The first row of  $v$  represents information on movie 1



The first column of  $u$

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The first column of  $v$  represents information on movie 1



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If  $U$  has two or more columns, what do they generally represent? Two or more entries in a category, such as



A typo!

The rank of  $X$  is at most  $d$ . (not "at least", as was written above)



Just to double check in the lecture, it put  $[1,2,3]$  as  $V$ ? Should it be  $V$  transpose instead?

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