4. Collaborative Filtering: the Naive Approach

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

Collaborative Filtering: the Naive Approach

0:00 / 0:00 1.0x

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Compute the Derivative of the Regression Objective

2.0/2 points (graded)

Recall that each user a has a set of movies that (s)he has already rated. Let Y be a ma
columns whose $(a,i)^{\text{th}}$ entry Y_{ai} is the rating by user a of movie i if this rating has alr
blank if not. Our goal is to come up with a matrix X that has no blank entries and whos
the prediction of the rating user a will give to movie i.

Let D be the set of all (a,i)'s for which a user rating Y_{ai} exists, i.e. $(a,i) \in D$ if and o
a to movie i exists.

A naive approach to solve this problem would be to minimize the following objective:

$$J(X) = \sum \frac{(Y_{ai} - X_{ai})^2}{2} + \frac{\lambda}{2} \sum X_{ai}^2$$

For (any fixed) :

lambda*X_{ai}

? STANDARD NOTATION

Submit You have used 3 of 5 attempts

Performance of the Naive Approach

2.0/2 points (graded)

Let us now check the quality of the solution when using this wrong approach. Recall th
assumes independence between all entries of the matrix.

What value of the matrix will minimize the loss

each , solve the following equation for :

We will denote the argmin as and its components as .

For :

Y_{ai} / (1+lambda)

For :

0

? STANDARD NOTATION

Submit

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- [staff] Unable to submit answer to first question
  Hi! I just got this message after submitting my answer to the first problem: *"Could not format HTML for prob
- Error message in Part 1 → Invalid Input: \'ai\', \'lamda\' not permitted in answer as a variable
  Based on my understanding, the answer in the first part needs to be in terms of lamda and x_ai. However, I a
- Why is it called Naive?
  Is Naive being used in the sense of the english word or is Naive someone's name.
- Still trying to understand why we need to add lambda/2 * |x| to the equation?
  Why must we do that for the equation in this lecture?
- Replacing sum(Xa_(i,j))**2 with norm(X) at 5:00
  Dear all, shouldn't it be norm(X)**2? or just norm(X) here :). Many thanks in advance