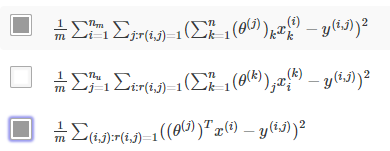
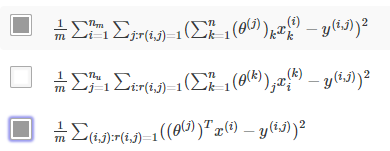
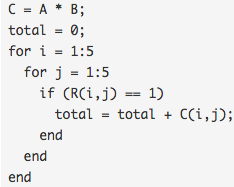
* Suppose you run a bookstore, + have ratings (1-5 stars) of books. Your collaborative filtering algorithm has learned a parameter vector θ(j) for user j, + a feature vector x(i) for each book. You would like to compute the training error/average squared error of your system's predictions on all ratings you’ve gotten from your users. Which of these are correct ways of doing so?
* For this problem, let m = total number of ratings gotten from users 
* `
* In which of the following situations will a collaborative filtering system be the most appropriate learning algorithm (compared to linear or logistic regression)?
* **You run an online bookstore + collect ratings of many users. You want to use this to ID what books are "similar" to each other (i.e., if a user likes a certain book, what are other books that she might also like?)**
* **You own a clothing store that sells many styles + brands of jeans. You’ve collected reviews of the different styles + brands from frequent shoppers + want to use these reviews to offer those shoppers discounts on the jeans you think they are most likely to purchase**
* You manage an online bookstore and you have the book ratings from many users. For each user, you want to recommend other books she will enjoy, based on her own ratings and the ratings of other users.
* You've written a piece of software that has downloaded news articles from many news websites. In your system, you also keep track of which articles you personally like vs. dislike, and the system also stores away features of these articles (e.g., word counts, name of author). Using this information, you want to build a system to try to find additional new articles that you personally will like.
* You run a movie empire + want to build a movie recommendation system based on collaborative filtering. There were 3 popular review sites (A, B, C) which users to go to rate movies, + you’ve just acquired all 3 companies that run these sites. You'd like to merge the 3 companies' datasets together to build a single/unified system. On site A, users rank a movie 1-5 stars. On site B, users rank on a scale of 1-10, + decimal values (e.g., 7.5) are allowed. On site C, ratings are from 1-100. You also have enough info to ID users/movies on 1 site w/ users/movies on a different site. Which of the following statements is true?
* **You can merge the 3 datasets into 1, but you should first normalize each dataset's ratings (say rescale each dataset's ratings to a 0-1 range).**
* **You can merge the 3 datasets into 1, but 1st normalize each separately by subtracting the mean + then dividing by (max - min) where max + min = (5-1) or (10-1) or (100-1) for the 3 sites respectively.**
* Which of the following are true of collaborative filtering systems?
* **Even if each user has rated only a small fraction of all products (so r(i,j)=0 for the vast majority of (i,j) pairs), you can still build a recommender system by using collaborative filtering.**
* **For collaborative filtering, it is possible to use one of the advanced optimization algorithms (L-BFGS/conjugate gradient/etc.) to solve for both the x(i)'s and θ(j)'s simultaneously.**
* If you have a dataset of users ratings' on some products, you can use these to predict one user's preferences on products he has not rated.
* When using gradient descent to train a collaborative filtering system, it is okay to initialize all the parameters (x(i) + Ө(j) to zero)
* To use collaborative filtering, you need to manually design a feature vector for every item (e.g., movie) in your dataset, that describes that item's most important properties.
* If you have a dataset of user ratings' on some products, you can use these to predict a user's preferences on products he has not rated.
* Recall that the cost function for the content-based recommendation system is



Suppose there is only 1 user + he has rated every movie in the training set. This implies that n(u) = 1 + r(i, j) = 1 for every (i, j). In this case, the cost function J is equivalent to the one used for regularized linear regression.

* You have 2 matrices A + B, where A is 5x3 + B is 3x5. Their product is C = AB, a 5x5 matrix. Furthermore, you have a 5x5 matrix r where every entry is 0 or 1. You want to find the sum of all elements C(i, j) for which the corresponding r(i, j) is 1, + ignore all elements C(i, j) where r(i, j) = 0. One way to do so is the following code:



* Which of the following pieces of Octave code will also correctly compute this total?
* **total = sum(sum((A \* B) .\* R))**
* **C = A \* B; total = sum(sum(C(R == 1)));**
* **C = (A \* B) .\* R; total = sum(C(:));**