Q1. Part 1: Predicting Ratings as a Classification - Theoretical Questions

1. Why do we subtract 1 from the target labels during training?
   We subtract 1 from target labels, because in a traditional model, array indices start from 0 whereas in the MovieLens database, the ratings are from 1 - 5. So, we subtract 1 in order to avoid index bound errors
2. How does the classification approach compare to regression for rating prediction?
   When we use regression approach, the predictions are generally a floating point integer that doesn't consider class weights in the calculations. Whereas in the classification approach, the class weights are considered with more bias towards infrequently occurring data resulting in a class value from 1- 5 which more accurately represents an actual rating.
3. What are the limitations of using accuracy as a metric for this problem?
   The main problem of using accuracy as a metric for this is the accuracy is a binary qualifier and treats a prediction of 4 and a prediction of 1 for an actual value of 5 as a wrong/inaccurate value while completely ignoring the closeness of the values.

Q2. Part 2: Deep Recommender System for Implicit Feedback - Theoretical Questions

1. Why do we need a separate DeepMatchModel for evaluation?
   The deep triplet model uses triplets - user, positive and negative values during training. This does not work for evaluation as evaluation works in a binary way of user, x/no x pairs. So, using a separate match model decouples training logic from inference logic.
2. How does the margin parameter affect model training?
   The margin decides the difference between positive and

negative values in the loss metric. A large margin means more separation with more positives while a small margin means overlap in positive/negative values.

3. What strategies could you use to improve the ROC AUC score beyond 0.8?
   Some of the ways ROC AUC score can be improved are:
   i) Changing the margin and including L2 regularization
   ii) Train for more epochs
   iii) Sample less negatives
   iv) Increase model capacity
   v) Early stopping