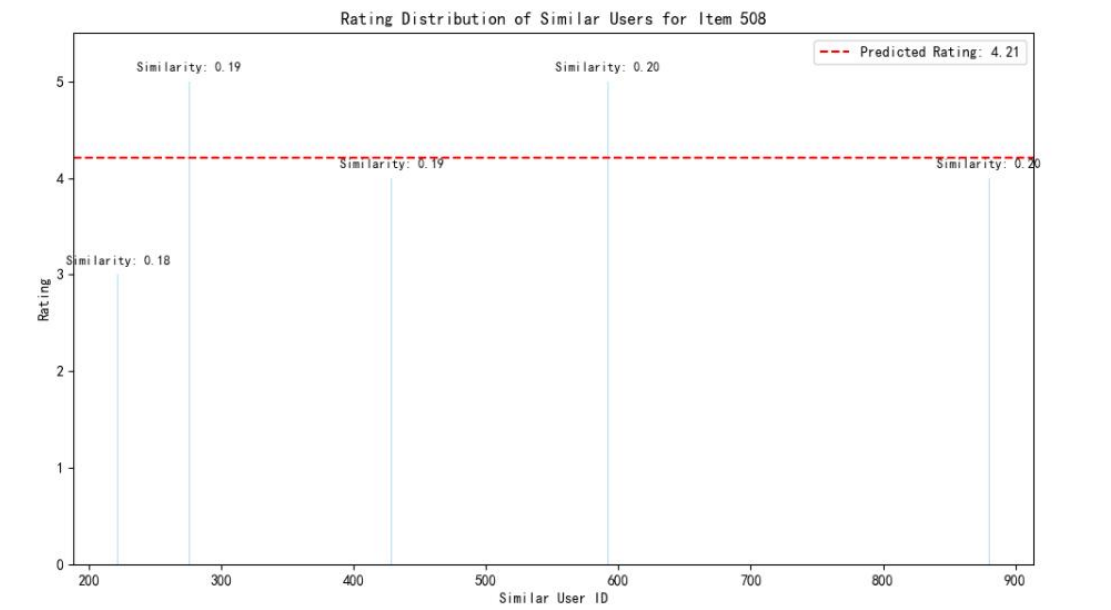
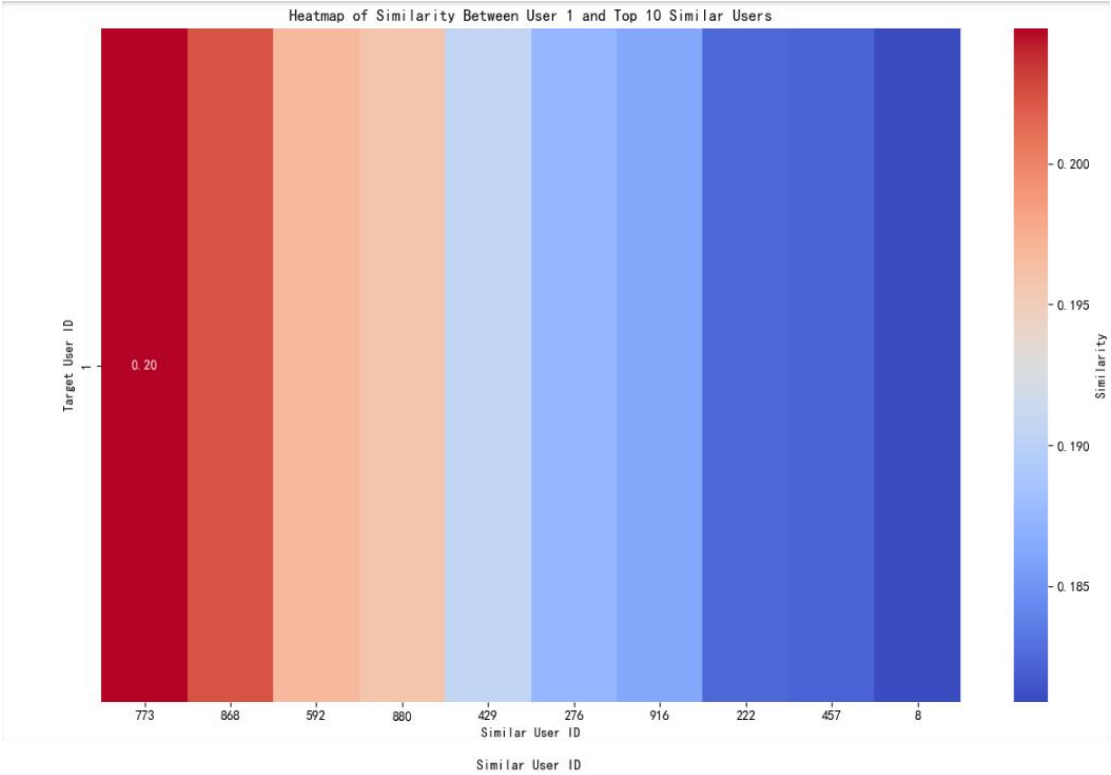
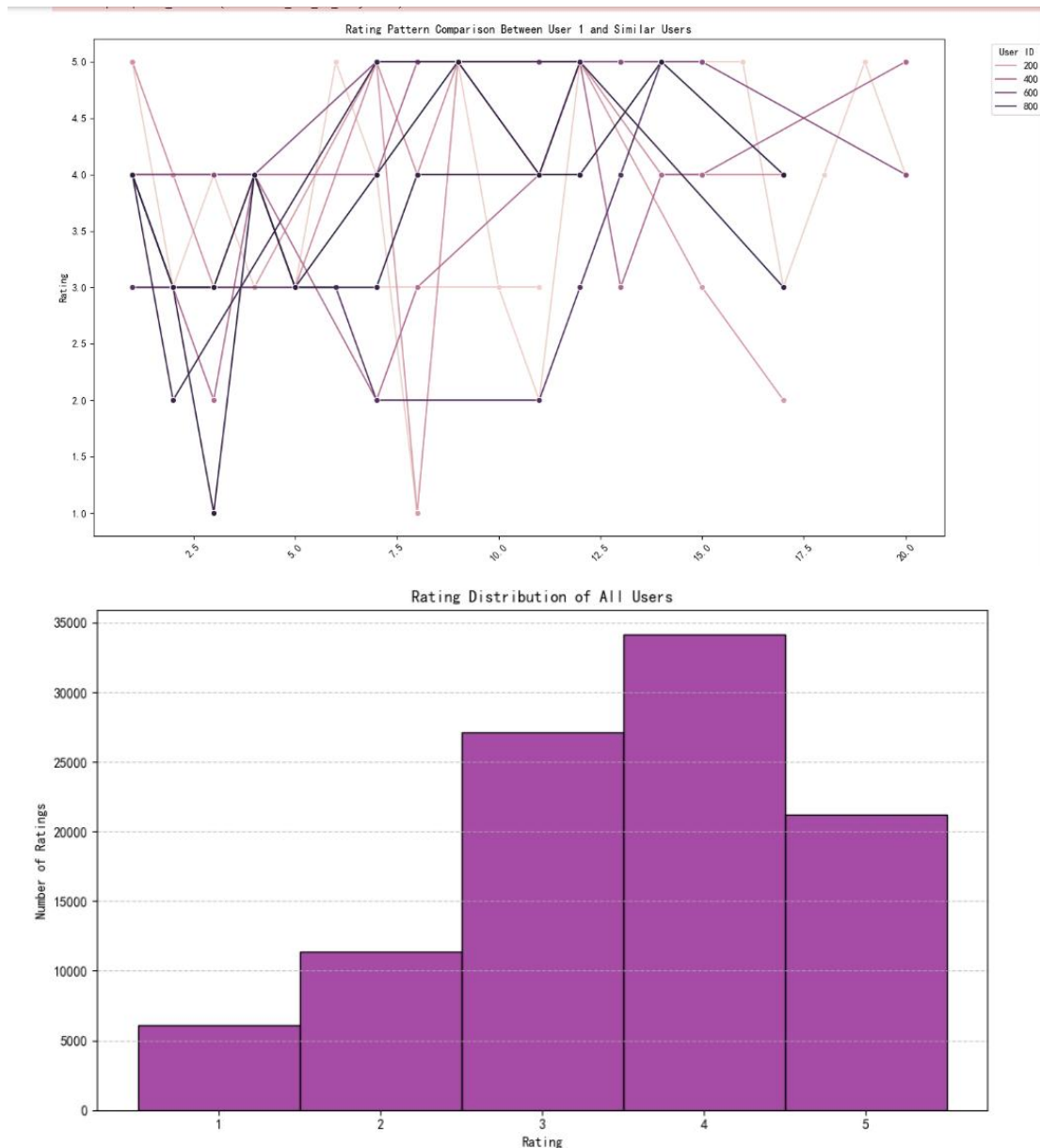


Q1.1

Top 10 similar users to user 1: [773, 868, 592, 880, 429, 276, 916, 222, 457, 8]
Expected rating for user 1 on item 508: 4.21





According to the result, I can come up with the information below:

The calculation results of the cosine similarity between the centered rating vector of User 1 and those of other users show that the IDs of the top 10 most similar users are: 773, 868, 592, 880, 429, 276, 916, 222, 457, 8 (Figure 1). The rating patterns of these users are highly similar to that of User 1, indicating a strong consistency in their movie preferences.

For Item 508 (such as a certain movie), after calculating the weighted average of the ratings of this item by similar users, the expected rating of Item 508 for User 1 is 4.21 (Figure 2). This prediction is based on the actual ratings of similar users (taking into account the similarity weights), suggesting that User 1 may have a high preference for this item, and the recommendation system can consider it as a high-priority recommended item.

Combining the similarity analysis and prediction results, the expected rating of item 508 by user 1 reaches 4.21. It is recommended that the recommendation system include this item in user 1's personalized recommendation list to improve user satisfaction and recommendation accuracy.