Music Recommendation System Based on NetEase Cloud Music

1   Abstract

Recommend system, as one of the most successful web intelligence implementation, has created a great impact on our daily. For instance, when I shopping online in amazon or other shopping websites, their recommended system will automatically push the items information, which we interested most based on the huge items and users' information. So, this project main objective is to build a recommended system by applying the method learning from this course. Therefore, we will sperate this project into six parts, namely, problem identification, data acquisition, data processing, data analysis, building a recommendation system and visualization of results.

2   Project Motivation

The amount of data is getting larger and there is not necessarily a relationship between the data. So what we need to do is to extract the data and analyze the relationships among massive data and do a recommendation to our users.

For example, Everyone's historical listening record is different, some people like classical and some like pop. If we can extract these records, then we can label each type of person, i.e. what type of music they like. Meanwhile, we should also label every song and match the users and songs. Having done this, we recommend songs to every user and need to do feedback. If users like the songs we recommend, they will listen to them many times so our recommendation is accurate. But if they only listen one time and do not listen later, it means we need to reconsider our algorithms to obtain a more accurate result.

3   Recommendation Method Analytics

There are many existing recommendation methods, and different classification results can be obtained according to different classification standards. [2] According to the different data sources used in the recommendation methods, content-based

recommendation and user-behavior-based recommendation are the two most common types of recommendation methods.

The basic idea of content-based recommendation is for a given user to recommend other items that are similar in content to the items he liked before. The similarity calculation methods between items including vector space Model, improved vector space model, explicit decision model, linear classification and machine learning, etc. And, the basic idea of user behavior-based recommendation is to use the similarity of interest, and the group preferences with common experience will be used. The author recommends items that may be of interest [2]. Its most extensive calculation method is collaborative filtering, including user-based collaborative filtering, item-based collaborative filtering.[3]

The single recommendation method has its advantages and disadvantages. For example, [2] pointed out that content-based recommendation does not require a large user community or scoring history. A single user can generate a recommendation list, but the items recommended to users and the items the user has already consumed are very similar, which makes it difficult to find the types of items that the user is not familiar with but potentially interested in, and the surprise to the user is not high;

Recommendations based on user behavior data do not need to obtain the characteristics of the user or the project in advance and only rely on the user 's historical behavior to model the user 's interests, to make recommendations for users. However, they are too dependent on the user 's historical behavior, which makes the recommendation method impossible to meet users' changes in interest in a short period.

For the shortcomings of the above-mentioned content-based recommendation and user-action data-based recommendation, we would like to choose user behavior-based recommendation after we balanced their advantages, disadvantages, and usages.

Due to the characteristic of our project, It's hard for us to support real-time online feedback both for both front-end and back-end to recommend. Besides, we could only get limited recent user data to predict items whether the user likes recently, instead, we have a large user-behavior history to model user's interests.

To be specific, according to our data warehouse, the number of items is extremely larger than the user. [4] Pointed out that, the recommendation of a few trusted neighbors

is more accurate than that of many neighbors without much discrimination generally. What's more, diversity is a great advantage of user-based CF, which implies that users similar to themselves cloud always find something new that they haven't found yet.

Sum up, User-based collaborative filtering algorithm is our best choice on performance, feasibility, accuracy, and serendipity

- Impact factor
  - o Based on user charts (leaderboard types, song play scores)

    Leaderboard of the last week

    All-time leaderboards
  - o User-based playlists (playlist types, playlist playlists, playlist tags)

    Love music song list

    Created playlist

    Favorite/Marked playlist
  - o Songs obtained from charts and playlists (song labels, song artists)

4 Time Schedule Plan:

now – 24 Mar(1 week): Information Retrieve

25 Mar – 30 Mar(1 week): Data proceeding and Data analysis

31 Mar – 13 Apr (2 weeks): Recommendation systems design and programming

14 Apr – 20 Apr (1 week): data visualization, Reporter and presentation slides

21 Apr -: some adjust and addition

5 Summary:

The music recommendation system is very useful and could be a core competence for a music platform. The project is to try to design a music recommendation system based on NetEase Cloud Music. To achieve this goal, we plan to carry out the project by problem identification, data acquisition, data processing, data analysis, building a recommendation system and visualization of results. The recommendation method the project may be used

is a user-based collaborative filtering algorithm. Finally, a music recommendation system based on NetEase Cloud Music would be found, and we will take some efficient methods to evaluate the recommendation system.

6 Reference:

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[2] 朱扬勇, 孙婧. 推荐系统研究进展. 计算机科学与探索, 2015, 9(5): 513-525. DOI:10.3778/j.issn.1673-9418.1412023

[3] 王国霞, 刘贺平. 个性化推荐系统综述. 计算机工程与应用, 2012, 48(7): 66-76. DOI:10.3778/j.issn.1002-8331.2012.07.018

[4]Michael D, John T, Joseph A. Evaluating Collaborative Filtering Recommender Systems, ACM Transactions on Information Systems, 2004, 22(1):5-53. DOI: 10.1145/963770.963772