Umusic : Phase 1

Informatien & Knowledge Engineering Project

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Contents

Goal

The goal of our application is to provide users with music recommendations, based on their listening behaviour. It should help users by finding music they like, but would have not discovered themselves. It should let users connect to other users with the same taste in music and let them recommend music to each other by sharing their playlists.

It should also let users share songs, artists or their playlist throughout the web on social networks like Facebook and Twitter.

The application should be able to:

- Provide authentication methods for users
- Remember users favorite genres
- Let users rate recommendations
- Remember personal ratings
- Recommend music based on the genres and ratings provided by the user
- Let user have a playlist
- Stream users playlist
- Share playlist with other users
- Share playlist on the web (Mail, Facebook, Twitter, Google+)
- Provide information about the artist or song like a biography or news
- Provide information about the artist gathered from Twitter or YouTube

Scope

The application is focused on the end user. It uses data, gathered from various music websites such as Last.fm to find music for the user. This data has to be analyzed and linked to the main dataset, the Million Song Dataset. We will use the Playme.com API to stream music and the Echonest API for more data about music.

The application will show the user recent posts about a certain artist or song. This information will be collected from Twitter or YouTube.

Functional Description

In the application, users can register for an account. At the first login we will ask the user to select the music genres he or she likes. Based on this information the application is able to narrow down the set of songs it recommends music from.

The system displays a list of recommendations based on the selected genres. If a user likes a song from the list, he has the option of adding it to his playlist or removing it from the suggestion list. Based on this feedback the probability that this song or a similar one will be recommended again, is adjusted. The user can also give feedback about songs while they are in his playlist. The chance that the certain song will be recommended again is thus respectively highered or lowered. In the case that a user really doesn't like a certain artist or song, he can block it.

The application will use PlayMe.com to stream the music in the playlist to the user.

The application will also display recent information about artists or songs, gathered from social websites like Twitter or YouTube.

Users will be able to save their playlist and share them with other users of the application. It will also be possible to share a playlist or a song on Facebook or Twitter.

Planning

Week 1-2

- Analyse available data
- Link data
- Global Design of the application
- Set up Kohana Framework
  - Controllers
  - Connect to Million Song dataset
- Find ways of streaming music to the user
- Design Recommendation Algorithm + data structure

Week 3-4

- Update Application design
- Implementation of:
  - Kohana Models
  - User Account system
  - User feedback storage in database
  - Recommandation Algorithm
  - Updating database according to user feedback
  - Recommendation of new songs
  - Unit tests
  - Music Streaming
- Specify evaluation plan

Week 5-6

- Application Lay-out design (website)
  - Kohana Views
- Integration with social networks (Twitter, Facebook, Google+)
- Design Test cases
- Execute tests
- Fix problems in design and implementation

Week 7

- Testing
- Fix problems in application
- Write project documentation

Week 8

- Final tests
- Fix problems
- Update documentation
- Create presentation
- Evaluation

Implementation

The implementation of the product will consist of two parts, a web application for presentation and an underlying service for data gathering and analysis.

The Web application

The web application will be implemented with the PHP language. We will use the Kohana framework to provide a MVC basis. Kohana also contains various tools for communication with databases and other web services. The website itself wil be built on HTML5, CSS and Javascript. It will use the jQuery library and the Playme.com streaming API. We will use the Echonest API to fetch news items and artist biographies and display these as information to the user.

The Data service

The data service will convert the data from the Million Song and Last.fm dataset to a vectorized format which will make searching more efficient by our application. This service will also add data for new songs that are fetched from the Echonest API.

The Recommendation Algorithm

[TO DO]