Professional Software Development (H)

Team I

Project Specification for Resdiary.com

Outline:

The current resdiary.com portal allows diners to search for restaurants and available tables for dining. However, this requires users to select a specific date, time and location and to have a general idea of where they want to eat. A recommendation engine could be added to recommend new restaurants based on a diner's previous dining habits and their similarity to other diners. The goal of this project is to create a recommendation engine that accurately suggests places to eat based on previous restaurants and other people with similar preferences.

Functional Requirements

- The engine must accurately suggest places to eat based on the user's own previously visited restaurants and other users with similar eating preferences.
- Recommendations should be in close proximity to where the user typically eats or is currently searching.
- The engine should re-recommend previously visited restaurants provided the user selects this option.

Non-Functional Requirements

- The engine should be written in C# for easy integration within existing Resdiary systems.
- The system should give a response within 1 second after receiving the request (provided data is stored locally).
- New users should be presented an optional quick quiz/questionnaire to gather initial data.
- User locations and restaurant recommendations should be interpreted using coordinates rather than city/town name as those could be of arbitrary precision.

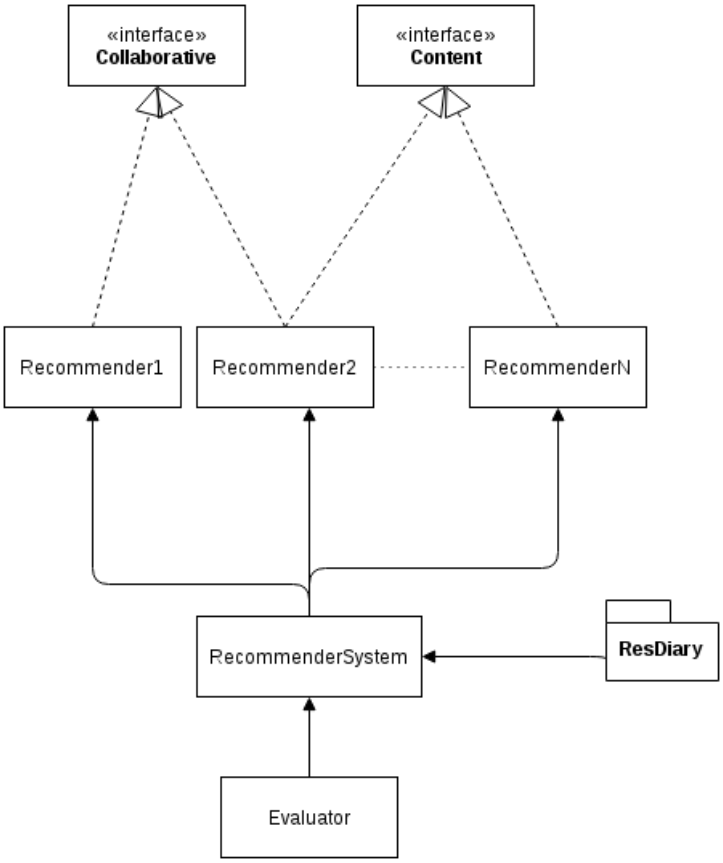
ID	TYPE	As a...	I want to...	So that I can...	Notes	Priority
1	Func.	Existing user	Be recommended new restaurants	Enjoy a new dining experience		High
2	Func.	New user	Be able to take a quiz	Get good initial recommendations		High
3	Func.	Existing user	Be able to take a quiz	Refine recommendations to get more accurate ones		High

4	Func	User	Have recommendations take my budget into account	I'm recommended restaurants within my price range.		Med
5	Func.	User	Be able to disable re-recommendations	Always be provided with a new experience.		Low
6	Func.	Admin	Disable re-recommendations	Always have a new experience.		Low
7	Func.	Restaurant owner	Have my restaurant recommended to new users	Expand and grow my business with new customers		Low

Split stories into tasks

- Draw up a database schema for storing relevant user information
- Make a questionnaire for new users to generate initial data:
    - Create a basic front-end including simple yes/no questions, location fields, preferred and non-preferred cuisine types.
    - Set up the back-end to process and persist questionnaire data
- Make a questionnaire for current users to improve recommendations:
    - Create a basic front-end including simple yes/no questions, location fields, preferred and non-preferred cuisine types.
    - Set up the back-end to process and persist questionnaire data
- Write the recommendations engine, taking the following parameters into account:
    - Other user reviews
    - Other user favourite restaurants
    - Current or ordinary location
    - Cuisine type
    - Price
    - Restaurant availability
- Create a stand-alone front-end prototype for displaying recommendations
- Integrate the engine into resdiary.com

High-Level System Design



Workflow

1. ResDiary sends a User object to our Recommender System, which contains all their previous reservations and reviews.
2. Recommender System sends that object to all Recommenders in the system.
    a. Some of the Recommenders are collaborative: they find similar users and recommend restaurants that those users liked.
    b. Some are content-based: they look for similarities between restaurants and recommend similar restaurants based factors such as price range and cuisine.
    c. Some Recommenders can combine both approaches.
3. Each Recommender returns the top N recommendations to the Recommender System.
4. Recommender System combines them based on some predefined coefficients and outputs the final recommendations.

Evaluator class can be used to judge system performance. For example, the restaurant review data could be split based on timestamps. Earlier data can be provided to our Recommender System. The System recommendations can then be checked against later bookings and reviews. The Evaluator outputs the percentage of bookings that our system guessed right.