Comparing the efficiency of Elo and Hot rank algorithms on pairwise recipes

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Motivation and Background

• The purpose of this experiment is to test the efficiency of the Elo and Hot Rank algorithms on pairwise recipes.
• An algorithm is a set of guidelines that describe how to perform a task.
• The Elo algorithm is a rating system designed for chess players. It compares the ranks of two players in order to determine which player would win the match.
• The Hot Rank algorithm was designed for the site, Reddit. The algorithm takes the number of up votes, down votes, and the submission time of the post in order to determine how popular it is. The posts popularity determines where it is ranked.

Methods

Database

• The algorithms get their list from a PostgreSQL database.
• The list contains four columns: an id, cuisine, ingredients, and a ranking.
• The list contains a thousand inputs.
• These inputs are queried as a list for the algorithms to sort.

Implementation of the Elo and Hot Rank algorithms

• For the purpose of this research different elements from the algorithm was taken in order to sort the recipe id’s.
• Both algorithms are implemented differently in order to simulate how they may function in reality.
• The original Elo algorithm is not a sorting algorithm. The original Hot Rank algorithm is a ranking algorithm. The two were modified accordingly.

Elo algorithm

Start
Read Input List
Declare id 1 and 2
Calculate probability of id 1 vs 2
Update Ranks
Sort
Output List
End

Hot Rank algorithm

Start
Read Input List
Declare id 1 and 2
Calculate hot score
Sort
Output list
End

References


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Preliminary Findings

Big O Notation

• Used to describe the time complexity of the algorithm. It usually provides the upper bound growth rate of the algorithm.
• For the Elo algorithm its big O notation was measured to be O(n²)
• The Hot Rank algorithms big O notation was measured to be O(n² log n)

Physical Results

Below the chart details the Elo algorithm and the Hot Rank algorithms times in sorting 50, 100, 150, and 200 items within a list.

Next Steps

For future work a recipe application would be built. This recipe app would display recipes for users to quickly swipe through to decide if they wanted to use it as well as rate the recipes depending on whether or not they enjoyed the recipe. The recipe app would be built using the data collected within this experiment.