Team Name: JAM

Project Members:
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Project Name: Fast Recipe

Problem:
We want to compare the runtimes of searching a recipe database for different scenarios using an AVL tree versus a splay tree data structure.

Motivation:
We want to illustrate how frequency of searches for certain data points impacts runtime for a large volume of searches. In our case, we believe certain popular recipes will be searched very often, and a splay tree should perform better than an AVL tree if a small percentage of recipes encompass a large percentage of searches.

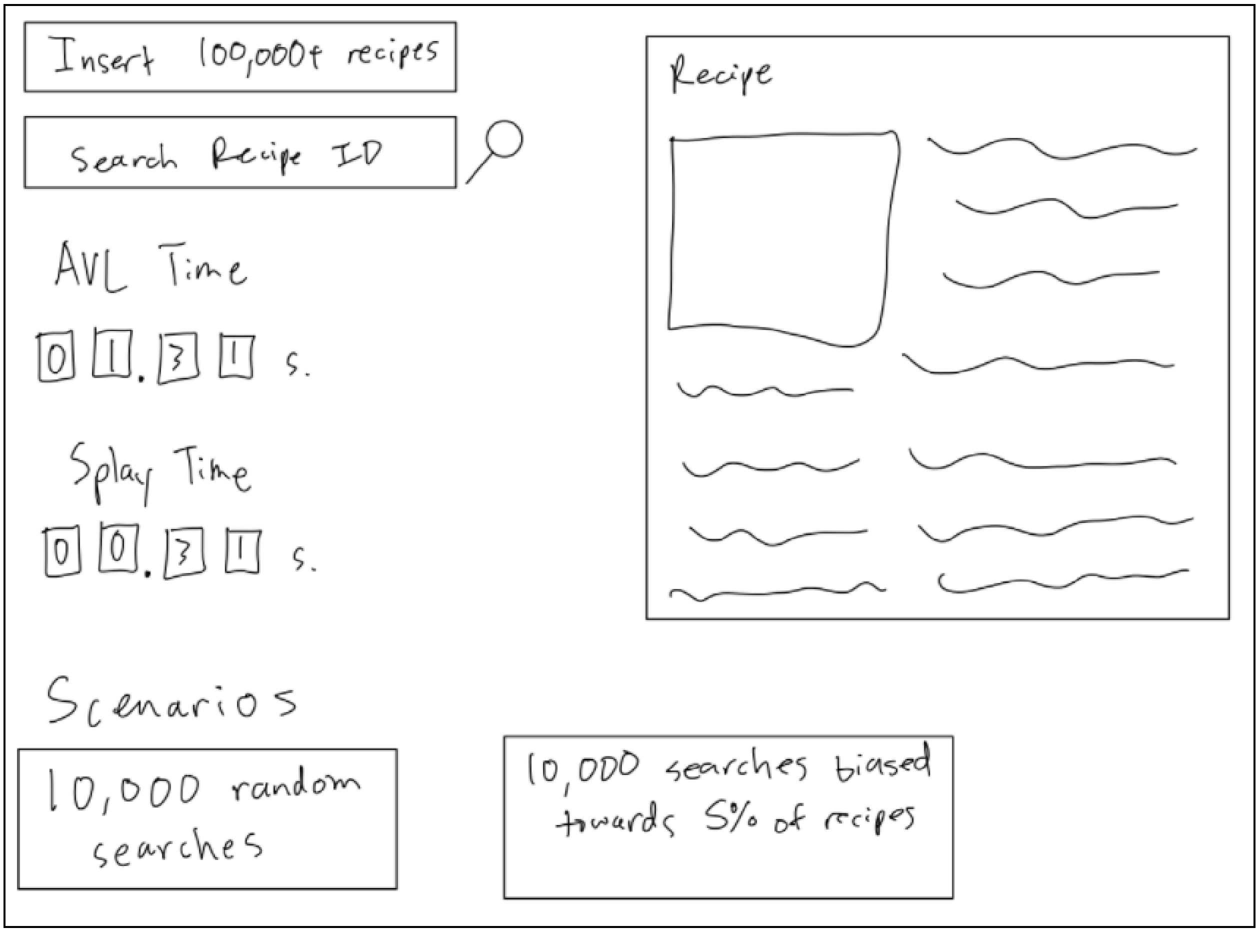
Features:
When we test a large amount of searches (thousands…) and use timing to determine how long the search operations take, we will have addressed the problem. We want to compare performance of an AVL tree and splay tree based on whether the search operations are completely random or biased.

Data:
This dataset has over 100,000 recipes with data points on each recipe including name, calories, macro breakdowns, ingredients, and ingredient breakdowns. The contents of each recipe are irrelevant in addressing the problem, but searching recipes provided a good real-world scope for the application.
https://academic.oup.com/database/article/doi/10.1093/database/baaa077/6006228

Tools: Programming languages or any tools/frameworks we will be using [0.25 point]

- Python for programming using data structures and algorithms
- Django backend with Python
- HTML/CSS/JS for rendering the main web page

Visuals: Wireframes/Sketches of the interface or the menu driven program [0.25 points]



Strategy: Preliminary algorithms or data structures you may want to implement and how would you represent the data [0.25 points]

The recipes will be represented in nodes with the ID number of the recipe being compared in the tree on insertion and search. To retrieve the recipe data, a database query will be called on the ID value.

- Non-trivial Data Structure 1- Splay Tree
- Non-trivial Data Structure 2- AVL Tree

Distribution of Responsibility and Roles: Who is responsible for what? [0.25 points]

- Jonathan- Setting up the Django framework and loading in the data into a database for easy access
- Miguel- Implementing the skeleton code for the splay tree
- Tony- Implementing the skeleton code for the AVL tree

References

N/A