Logbook

Assignment 1: The Great Snellius Bake Off
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Step 1
We started off with the approach explored in ‘Tutorial 1: Simple PIERRE’. An inspiring set was conducted based on cookie recipes from Allerhande Albert Heijn. We used a single source for the consistency of measurement units. The ingredient amounts have been recalculated so that all recipes exactly match 24 servings. Each recipe included: a name and a list of ingredients with the corresponding amount in units, grams, or teaspoons.

The program extracted recipe-specific ingredients through a function that counted the number of occurrences in the inspiring set. The recipes that included 1 to 3 unique ingredients received extra fitness points in the evaluation. This way the program was able to generate recipes without having to add classification (sweet, savoury, liquid, herb, spice, etc.) in the inspiring set. However, the program could not create novel combinations because it used existing combinations.

Step 2
More specific information about the individual ingredients was needed in order to create good recipes. Each ingredient now included a type: fat, sugar, flour, binding agent, rising agent, salt, spice, decoration, topping, or icing. This allowed the evaluation to verify that the essential ingredients were present in the recipe. It could also be useful for automatic cookbook generation.

Figure 1: a screenshot of a single recipe in the final inspiring set

By playing with the fitness function, we discovered that assigning minus points can work well to counteract excessive proportions. This was done when the ingredient list became too long and when ingredients exceeded conventional margins.

At this stage, the program was still not able to generate interesting combinations. However, the current functionality does provide a solid foundation, as it can verify whether the recipe matches the characteristics of a cookie recipe.

Step 3
We discovered that the toppings and spices mainly determine the taste of a cookie. Based on this insight, we created a JSON file with toppings and spices and for each a list of ingredients that go nicely with it, see figure 2.

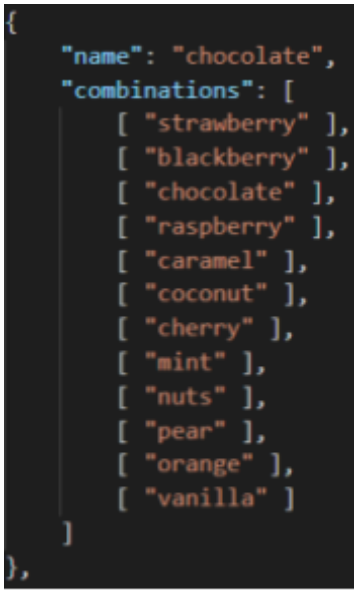

Figure 2: a screenshot of a single ingredient in the pairings dataset

The system awards extra fitness points if the recipe contains a tasty combination of ingredients. For example, if the primary flavor of the recipe is chocolate, it will receive extra fitness points if it also contains vanilla.

Step 4
To make sure that the ratio of a cookie is the right fitness for a “good” cookie some steps were implemented to get this ratio right. Because a cookie with 80% butter wouldn’t be nice. Furthermore, some fruits and spices have to be limited to a small amount to not dominate the overall taste. Ingredients that are measured in grams are rounded to tens to make them more consistent.

The title is based on the topping or spice that is the most used in proportion in the recipe. Also, it adds an adjective that indicates if there is a lot included or not; like sweet to strong.

Step 5
Most cookie recipes use similar preparation methods, which is why we chose to automate the creation of a cookbook. A template is filled in with the names of the ingredients associated with the particular recipe.

Roughly, it goes as follows: butter, sugar, and eggs are whisked into a bowl. Then spices and toppings are added to the mixture. This is then divided into dough balls and baked for about 15-20 minutes in the oven.

Some recipes require additional preparation, like grating the zest of a lemon or making a glaze. For such special cases, we have added manual instructions.

Limitations of the creative system
The system strongly relies on the data it is fed. Chocolate is used in many recipes, so this ingredient often overwhelms other toppings. This issue has been solved by assigning minus points for chocolate. However, this solution is not optimal, as other datasets may be more equally divided.