Report

The concept: It’s an app that adjust a recipe with three ingredients to make it fit the macro nutritional values you set. Also can be used for portioning food, so how many chips can I eat with this steak and how much of the sauce can I eat to end up with exactly this many calories and protein/carbs/fats consumed. A completely random idea (give marks for creativity please).

The Execution:

GUI was made on MATLAB app designer because the interface we decided upon was relatively simple so this was the best choice.

The code works by creating a three by three simultaneous equation with per 100g nutritional information as the coefficients of the terms. Then you solve for X/Y/Z but with one adjustment.

A1X + B1Y + C1Z = D1 A2X + B2Y + C2Z = D2 A3X + B3Y + C3Z = D3

Where a1/b1/c1 are the coefficients set as protein per 100g of the relative ingredient, a2/b2/b3 the carbs and a3/b3/c3 the fats. D1 the protein %, D2 carbs and D3 fats. The twist in the execution was done to try and solve the simultaneous without getting negative values as we can’t tell them to use negative quantities of chicken. So we have them enter the protein percentage first then use this to create a two equation three term simultaneous which has a line of solutions (two planes intersecting on a three dimensional graph to make a line), whereas a three by three is three planes intersecting at a point only creating one solution. Then based on the line we adjusted the value the user can input for d2 (carb %). This works as d2 is part of the constant in the equation of the line so we shift the line across the x and y axis so it fits in the desired space (mathematically always works and is easier because we use percentages). Then the user enters the carb % and the fat % is just (100 - (protein + carb)%). The code then solves the three by three simultaneous and finds the one point solution and outputs the quantity of the three ingredients you should use or the portions of the three foods you should eat. Doesn’t often look like it will taste good but at least it’s an original idea.

The Extra Mark: I was told to include stuff I thought was worth extra marks or would help in marking. The main one is the solving a hard math problem to get positive values for the users as shown above. Other than that it is a completely original idea not a game/gameshow remake and was made completely from scratch no code we could usee and everything we had to learn and figure out ourselves.

Teamwork: We did a lot of the coding together in real life sitting side by side on laptops as it was more fun this way once we met up. So we didn’t use GitHub a whole lot but found this to be more efficient for us.