**Food Fitter**

*Tawsi Studios*

*February 11th, 2017*

I. Selected topic

We have chosen to create an automatic meal planner based off of the NutriCalc idea presented by Illya Pilipenko.

II. Project objectives:

This project aims to provide a “virtual meal assistant” service. This project will plan out perfect meals for the user based on their dietary and nutritional preferences. Using our algorithms, we will find ingredients for a meal that matches their settings. This project’s user interface aims to be a responsive, intuitive mobile application.

III. Roles assigned:

|  |  |
| --- | --- |
| **Role** | **Assigned to** |
| Full-stack developer | Alexie McDonald |
| Full-stack developer | Illya Pilipenko |
| Full-stack developer | Thomas Armena |
| Back-end developer | Wyatt Wismer |
| Back-end developer | Sophia Tao |

IV. Updated project plan:

# Food Fitter

## Abstract:

This is a program that helps users track and plan their eating habits, specifically the nutritional values of their meals in app format. The program uses datasets created by Health Canada which contain statistics of nutritional values of many different foods and meals, as well as datasets with recommended daily servings per food group per day. Using a DP knapsack algorithm it is able to efficiently compute meal plans that fit user targets for certain calories and nutrient content.

## Objective

The objective of this project is to create an application that will allow users to track their eating in a very in-depth way, with a vast array of nutritional information, as well as help with ingredient choice for meals.

## Motivation

* Personal experience was a motivator for this project, as checking one’s daily nutritional values is hard with mostly homemade food.
* Many people try to hit targets for calorie counts, fibre and other nutritional factors; however, finding an optimal combination of meal choices by hand is tedious and difficult. Food Fitter streamlines this process through a DP knapsack algorithm.
* Although similar tools such as this one exist, no other combines in depth nutritional values and statistics tracking. Additionally, it is always good to have a variety of choice in the matter.

## Prior Work

* nutritionalvalue.org: this is a website which can give you the nutritional values of foods you enter into it. It seems to actually give a more detailed account of nutrients contained in the food than the dataset has. However, it does not have a profile service, meaning the user cannot keep track of their eating habits.
* fooducate.com: this is an app meant for tracking one’s calories. It comes with a barcode scanner which allows store bought food to be tracked as well. The app also does have a user profile, since after all it focuses on helping the user control their calorie intake. However, it focuses mainly on calories, and only shows other major components such as fiber, sugar and cholesterol.

## Input/output and proposed solutions

1. <http://open.canada.ca/data/en/dataset/089885f9-ed53-44e6-854a-14d21a1ec2e0>

This dataset contains all of the nutritional values that will be used.

<http://open.canada.ca/data/en/dataset/e5f4a98e-0ccf-4e5e-9912-d308b46c5a7f>

This dataset has information for recommended servings per food type, which will be used to show the user if they’re eating healthily.

1. Inputs:

* Nutritional targets (Calorie count, fibre content, etc..)

1. Outputs:

* Approximate amount of nutrients of one or more specified types for a specified dish/ dish ingredients
* Statistics of previous nutritional values, and nutrition achieved compared to recommended goal.
* Combination of food items / ingredients that hit nutritional goals.

1. The user will search their ingredients / meal, and they will be given a list of best matches to choose from, using the names of the ingredients/meals dataset 1. They will then choose the approximate yield size of their meal. The chosen names will be matched with their corresponding nutritional values which will be modified by a factor determined by the user given yield and the dataset given yield. The result will output to the user, with nutritional values matched to the meals. The user can confirm the meal as one they cooked, which will be added to their statistics to track their eating habits.

## Algorithmic challenges

* The dataset will will have ifood name components loaded into a prefix tree for easy access
* The user will have the ability to sort the searched for meals/ingredients by name or food groups.
* A knapsack dynamic programming approach will be taken in order to find the optimal combination of foods that fit within the target nutritional goals of the user.

## Project plan

|  |  |
| --- | --- |
| Description | Date |
| Complete program framework with basic searching algorithm | Week 6-7 |
| Implement name sorting algorithm | Week 7 |
| Implement the ability to connect corresponding values from data tables into one using graph processing | Week 8 |
| Add the ability to combine ingredients into full meals, complete with yield values | Week 9 |
| Implement statistics and user profile for user eating habits | Week 10 |
| Add sorting by food groups | Week 10-11 |
| Create clean UI, improve searching algorithm if needed | Week 11-12 |

### References

* Fooducate Ltd. (n.d.). Lose weight & improve your health with a real food diet | Fooducate. Retrieved January 28, 2018, from <http://www.fooducate.com/>
* Health Canada. (2007, February 05). Choosing Foods. Retrieved January 28, 2018, from <https://www.canada.ca/en/health-canada/services/food-nutrition/canada-food-guide/choosing-foods.html>
* Health Canada. (2015, June 06). My Food Guide database. Retrieved January 28, 2018, from <http://open.canada.ca/data/en/dataset/e5f4a98e-0ccf-4e5e-9912-d308b46c5a7f>
* Health Canada. (2016, June 03). Canadian Nutrient File, 2015. Retrieved January 28, 2018, from <http://open.canada.ca/data/en/dataset/089885f9-ed53-44e6-854a-14d21a1ec2e0>
* Vanovschi, V. (n.d.). Nutrition Calculator. Retrieved January 28, 2018, from <https://www.nutritionvalue.org/nutritioncalculator.php>