Meal Plan Generator

SEDEV210 - Programming for Data Science
Masters of Science in Data Science

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1 Rationale

Meal Plans have increased in popularity over the past years. The benefits of which is the reduced mental load in deciding and planning meals which will free up time and make it easier for consumers to be able to meet their health or fitness goals. Meal plans offer targeted diets that would assist consumers in ensuring that they are aligned to their targets, may it be to reduce weight, to gain muscle, or to improve their overall health with a well-rounded meal.

The proposed system will take in the information that the users will provide regarding their biodata and their targets to determine which plan would best suit them. It will provide recommendations on the types of foods that they should focus on to be able to meet their desired goals.

1.1 Data Requirements

The biodata required would be the biological gender of the consumer, age, fitness level, current weight, and target weight. These questions will be prompted at the beginning of their application to provide the information needed to perform the prediction proposed. The data will also require a person's current activity level to be able to account for the daily requirements of each individual.

1.2 Food Mapping

Food information is stored within the program that contains information regarding the types of food and their caloric impact/portion size. The program will cross-reference the types of food with the needs of the user to build the meal plan provided for the selected duration.

1.3 Algorithm-Based Meal Planning

By using the biodata provided, the system will be able to calculate the optimal meal plan for the customer. Taking into consideration the person's current activity level and their goals, the system will be able to account for the number of calories each individual needs to either maintain a calorie deficit or support an increase in muscle gain.

2 Features

2.1 Product Flow Diagram

The process begins with the user inputting the customer's profile, which includes the customer's name, age, and gender. After capturing these details, the user proceeds to input the customer's preferences. These preferences cover various aspects such as the customer's fitness objective, where options include:

- Weight Gain

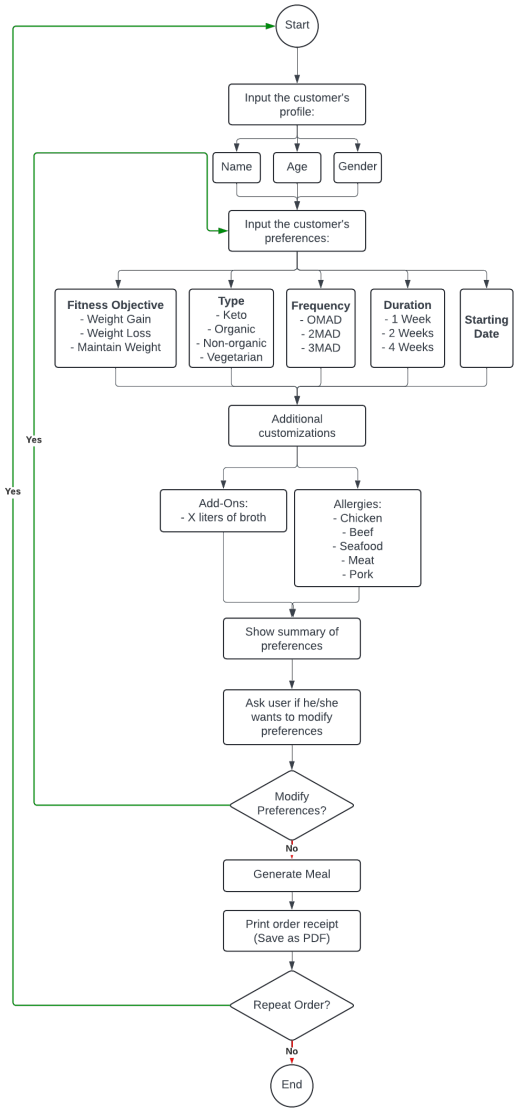

Figure 1: Product Flow Diagram

- Weight Loss
- Maintain Weight

Next, the user selects the type of diet, with options like:

- Keto

- Organic
- Non-organic
- Vegetarian

The frequency of meals is then chosen, offering the customer the choice between:

- OMAD (One Meal a Day)
- 2MAD (Two Meals a Day)
- 3MAD (Three Meals a Day)

Following this, the user sets the duration of the meal plan, which can be:

- 1 Week
- 2 Weeks
- 4 Weeks

and specifies the starting date for the plan.

Additionally, the user can customize the meal plan further by adding specific preferences like the amount of broth or indicating any allergies (such as chicken, beef, seafood, meat, or pork). Once all preferences are entered, a summary of these preferences is shown. The user is then asked if they would like to modify any of the preferences. If modifications are needed, the user is taken back to the preferences input step.

If no modifications are needed, the process continues with generating the meal plan. The user then has the option to print the order receipt and save it as a PDF. Finally, the user is asked if they would like to repeat the order. If they choose to repeat, the process starts over; if not, the process ends.

2.2 Meal Criteria

2.2.1 Keto Meals

- Low-carb, high-fat diet preference
- Aiming for weight loss, blood sugar management, or cognitive benefits
- Interested in keeping carbohydrate intake at or below 5-10% of total daily intake

2.2.2 Organic Meals

- Prioritizes consumption of ingredients without synthetic pesticides, herbicides, or GMOs
- Prefers sustainably sourced, environmentally friendly foods
- Concerned about the purity and quality of food, avoiding synthetic additives

2.2.3 Non-Organic Meals

- Budget-conscious, preferring more affordable options
- Less concern about organic sourcing, prioritizing taste or convenience
- No specific dietary restrictions related to organic food

2.2.4 Vegetarian Meals

- Follows a vegetarian diet, avoiding meat but consuming dairy, eggs, and other animal by-products
- Prefers plant-based meals for ethical, environmental, or health reasons
- Interested in meals rich in fruits, vegetables, grains, nuts, and seeds, without meat-based ingredients

2.3 Meals vs Calories

The following is a general guideline for the number of calories per meal based on the user's fitness objective:

Table 1: Suggested Calorie Count Based on Fitness Objective and Daily Meal Frequency

Fitness Objective	**OMAD (One Meal a Day)**	**2MAD (Two Meals a Day)**	**3MAD (Three Meals a Day)**
Weight Gain	2,500 - 3,500+ calories	1,250 - 1,750+ calories/meal	833 - 1,167+ calories/meal
Weight Loss	1,200 - 1,800 calories	600 - 900 calories/meal	400 - 600 calories/meal
Weight Maintain	1,800 - 2,400 calories	900 - 1,200 calories/meal	600 - 800 calories/meal

3 The Dataset

The dataset contains the following columns:

Meal	Type	Main Ingredient — Carbohydrate (%)	Protein (%)	Fat (%)
Herbed Chicken with Mushrooms	Keto	Chicken	10	30
Greek Meatballs	Keto	Beef	10	30
Fried Salmon Patties	Keto	Seafood	10	30
Turmeric Fish	Keto	Seafood	10	30

The calorie count and essential nutrients calculation is based on the dataset provided. Each meal entry includes the type of meal, the main ingredient, and the percentage composition of carbohydrates, proteins, and fats. This information is used to calculate the total calorie count and the distribution of essential nutrients for each meal.

The dataset has 414 available meals to choose, ranging from vegetarian, keto, organic and non-organic meals.

4 Usage

4.1 Installation

Run the following command to clone the repository:

```
git clone https://github.com/PeteCastle/meal-plan-generator
```

Ensure you have the required dependencies installed:

```
pip install -r requirements.txt
```

To generate the meal plan document, you need to have a Latex distribution installed on your machine. You can download the latest version of MikTex from the following link: MikTex

Not installing Latex compiler won't prevent you from using the program - only during the generation of the document

4.2 Execution

Run the following command to execute the program:

```
python main.py
```

The Dataset

The dataset contains the following columns:

Meal	Type	Main Ingredient	Carbohydrate (%)	Protein (%)	Fat (%)
Herbed Chicken with Mushrooms	Keto	Chicken	10	30	60
Greek Meatballs	Keto	Beef	10	30	60
Fried Salmon Patties	Keto	Seafood	10	30	60
Turmeric Fish	Keto	Seafood	10	30	60

5 Output

5.1 User Preferences

5.2 Meal Plan Output (CMD)

5.3 Meal Plan Output (Document)

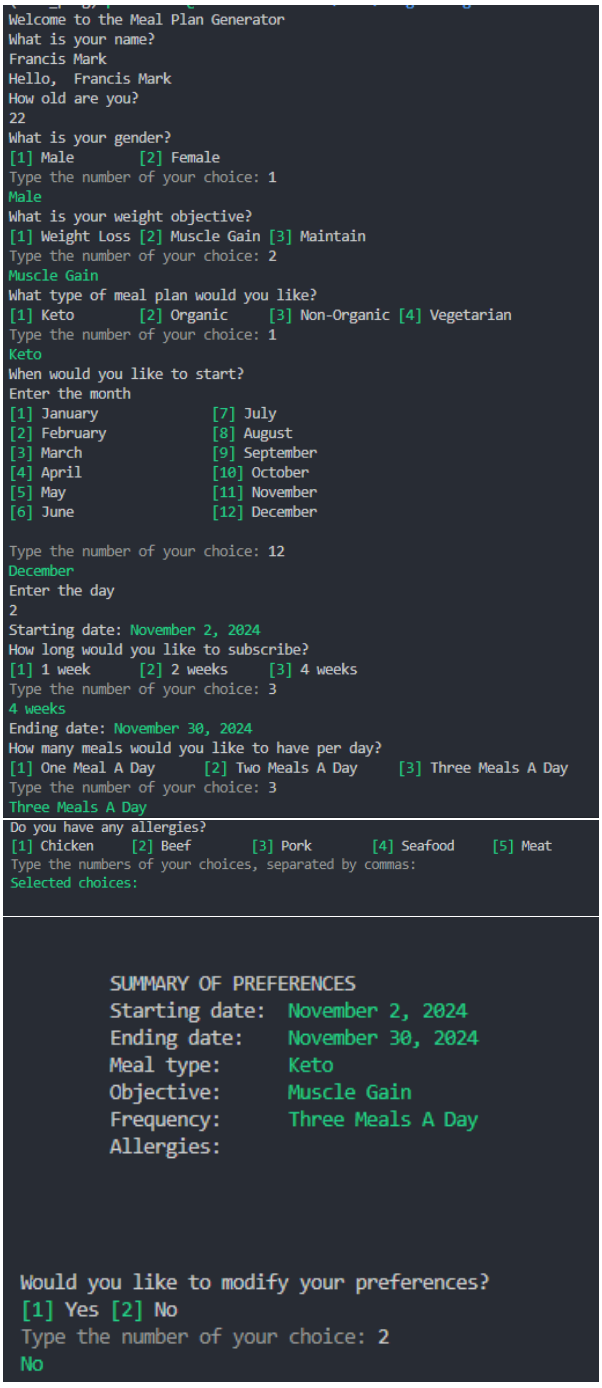

Figure 2: Sample CMD Output asking the user to input his meal preferences.

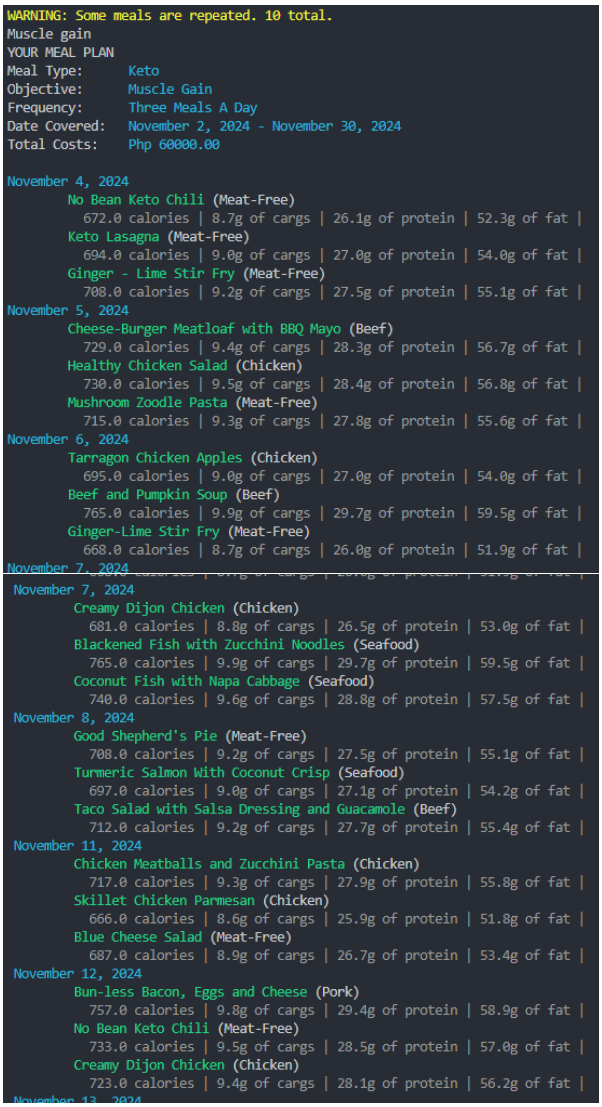

Figure 3: Sample CMD Output of the Meal Plan.

Meal Plan

Franmcissss

August 24, 2024

Meal Type:	Organic
Objective:	Maintain
Frequency:	Two Meals A Day
Date Covered:	September 1, 2024 - September 15, 2024
Total Costs:	Php 16000.00

September 2, 2024

Eggplant and Chicken Cakes

Chicken

611 calories
15.8g of carbs
47.5g of protein
15.8g of fats

Creamy Chicken & Squash Pasta

Chicken

646 calories
16.7g of carbs
50.2g of protein
16.7g of fats

September 3, 2024

Hash Brown with Bacon and Eggs

Pork

620 calories
16.1g of carbs
48.2g of protein
16.1g of fats

Gomoku Gohan

Meat-Free

659 calories
17.1g of carbs
51.2g of protein
17.1g of fats

1

Figure 4: Sample Document Output of the Meal Plan. Only the first page is shown for demonstration purposes.