Project Charter: Diet Analyzer with Recommendation Engine

Introduction:

Healthy eating is crucial for maintaining well-being and preventing chronic diseases. However, tracking dietary intake and ensuring it aligns with recommended nutrient guidelines can be challenging. This project aims to develop a user-friendly "Diet Analyzer" tool that utilizes matrix algebra to analyze daily food intake and provide personalized recommendations.

Project Objectives:

- Design a program that inputs users daily nutrition and calculates a macronutrient breakdown.
- Use matrix and element operations to implement a comparison between the users total nutrition intake and a recommended daily allowances (RDAs) matrix.
- Generate recommendations for dietary adjustments to help users achieve a more balanced diet.

Components:

- **Determine Nutrient Intake:**
    (1) Prompt the user to input their current weight, ideal weight, and the desired pounds lost per week (i.e. - .5 pounds per week).
    (2) Display a list of foods on file to the user. Then, prompt them to input their consumed food type and food quantity.
    (3) Scale a pre-made matrix to that particular food to calculate macros.
    (4) Store that food intake for later use.
    (5) Repeat the last three steps until the user no longer has any food to enter.
    (6) Store total macronutrient intake matrix for later use.
    (7) Use matrix operations to calculate total macro and calorie count.
- **Compare Nutrition Intake with RDA:**
    (1) Use the data so far to calculate a daily and weekly calorie deficit required to reach weight loss goals.
    (2) Compile macronutrient daily percentage recommendations from a credible health source, including balanced ranges of eating.
    (3) Calculate macronutrient percentages of the users daily intake.
    (4) Use an element-wise comparison to calculate the difference between the users intake percentages and the recommended percentages.
- **Recommendation Engine:**
    (1) Store macro/calorie excesses and deficiencies for later display.
    (2) Display whether the user is eating in the desired range to meet their weight goals in a balanced way.
- **Produce 5-minute Presentation:**
    (1) Background slide.
    (2) Intro slide.
    (3) Methods - Math and coding.
    (4) Result