TP0: Project proposal

Document:
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Project Description

Manage Your Fitness!

Overview
We are a platform that can:

- help you record your body index
- offer a calories counter of your deals and exercise
- help you achieve the weight goal from the start point of dietary intake and exercise expenditure
- visualize your body index and make your goal clearly visible

Features

- Daily record your dietary intake and exercise calories expended, and keep track of your body index(weight);
- Visualize body index including the charts of weight, BMI, basic metabolism.
- Show diagrams that are dynamically swapped based on user selection, including line charts, histograms, etc;
- Create a diet & exercise plan for users based on their goals over a period of time;
- Visualize the present and ideal body index comparison

Similar projects

Project	Similarities	Differences
MyFitnessPal	• Calories counter of food and exercise • Plans for healthy exercise and meal	• It offers recipes for users while it's kind of difficult for mine • My project will be a user-based platform which focuses on users themselves rather than a community.
Lose it!	• Learn about the foods they're eating and keep the calories within the daily budget.	• It uses computer vision to recognize the food, while it's too difficult for me to do that too.. (I may have a try after MVP with public modules

		though)

Structural Plan

Class	1. User_profile: a. Id b. Height c. Weight d. BMI 2. Food: a. Calories b. Serving 3. Exercise: a. Calories b. Time 4. Goal a. Weight b. BMI 5. Calories a. Intake b. Burned
Function	1. Calculate BMI 2. Calculate basal metabolism 3. Personalized plan for the user: a. Calculate the gap between goal weight and present weight b. Generate calories gap based on the user's basal metabolism c. Allocate calories to three meals and extra meals a day d. *(Nice to have)Recommend the appropriate exercise and time according to the exercise frequency and habits input by the user
Algorithm	1. Data storage: a. User dict b. Food dict c. Exercise dict 2. Data analysis: a. Show the average daily and weekly calories consumed and expended b. Predict the time it takes the users to the goal with the lifestyle 3. Draw graphs with data form database, user input, and calculation based on different functions on 112 canvas (Before MVP) a. Line charts to show the weight changes b. Pie charts to show the food type taken c. Histograms to show the average daily and weekly calories consumed and expended 4. *(Nice to have)Search for food/exercise with image

Algorithmic Plan

1. Store data locally
    a. Create Class “user_profile” and dictionaries to store the users’ information like weight, height, BMI, and basal metabolic rate, (key: user_id)
    b. Download database online as csv file to store the data
        i. Translate csv to json and read data in python
        ii. Use dictionaries to store food/per serving>calories, exercise/min>calories, and save as local file to store the data
    c. Create Class “goals” and dictionaries and save as local file to to store (key:user_id)
    d. Create class “daily_calories” and dictionaries and save as local file to to store the calories data user daily input(key:date)
    e. Create “plans” dictionaries to store the generated daily calories intake and expended (key:date)
2. Search for food:
    a. O(n) complexity to find value in dictionaries
    b. Binary Search (O(nlog(n)))
        i. “The search interval is repeatedly divided in half. If the element to be searched is lower than the central component of the interval, the interval is narrowed to the lower half. Otherwise, it is narrowed to the upper half. The process is repeated until the value is found.” (https://www.upgrad.com/blog/data-structures-algorithm-in-python/#:~:text=Algebra%20for%20Analysis-,What%20are%20algorithms%20in%20Python%3F,guide%20the%20writing%20of%20algorithms.)
3. Graphs
    a. Create graphs on 112graphs module

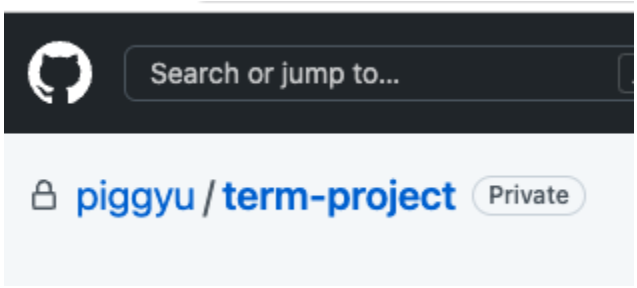
Timeline Plan

Time	Completion	Features
TP0	1. Design proposal	
TP1	1. Build the data related function: a. Input b. Store c. Calculate d. Output	

TP2(MVP)	1. Build the user input window with contents shown 2. Graphs: a. Data tables	
TP3(Due)	1. User input window 2. Graphs a. Data tables b. Line charts c. Pie charts d. Histograms	• Users can input data including gender, height, weight, and see the visualization of the curve of changes in body weight and BMI, with normal range as reference. • When users set a goal for their weight, they can get a diet & exercise plan and choose to follow it or not. • Users can input daily food eaten and exercise taken, showing graphs of the calories consumed and burnt. • Users can switch between different views of charts.

Version Control Plan

I will back up my code with github and I've create a file for it. I will update my data on the sites each day.

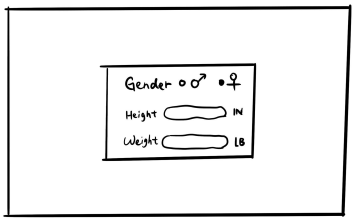


Module List

Will not use until MVP:))

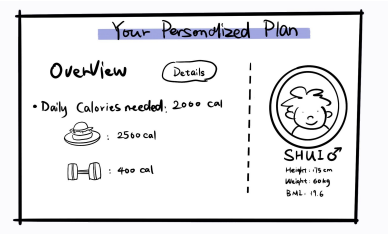
Storyboard

Shui is a 22-year-old guy who feels he is too skinny and wants to gain weight over a period of time, but doesn't know exactly what to do, such as how long to exercise every day and how much to eat.

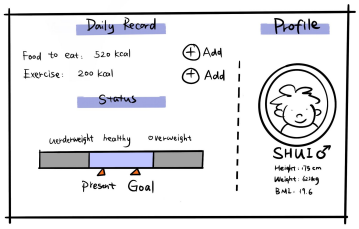


1.Shui input his information

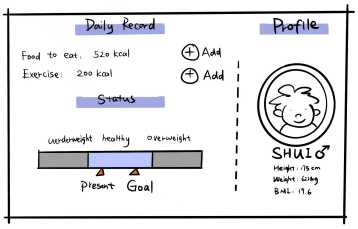
2.Shui set his goal of getting 10 pounds in 3 months



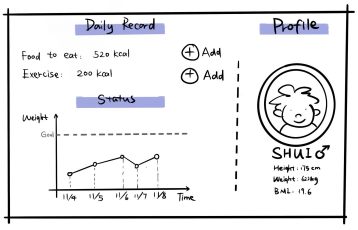
3.He gets his personalized plan our platform generates for him.



4.He input his daily food intake and exercise



5.After a period of time, he records the change in his weight and checks the gap between his current status and his goal



6.He switches between different views of charts

TP1 Update

- the function to recommend the best plan for the users:
    - calculate the rest calories per time when users click "recommend for me"
    - based on the results, to find different combinations of food which meet the needs of calories left per day
    - ??? provide the best combinations of food covering the most nutrients ??? (not sure)

TP2 Update

The main file is ‘draw4.py’ ,(run this file:)) draw 1-3 are different versions of the draft of it.

- User input their information and save it to local file;
- Display user information on screen as user profile, with a man’s profile image or a woman’s profile image;
- Three buttons to add food to breakfast/lunch/dinner, and we’ll calculate the calories, and display the total calories they take in one day
- Press ‘u’ to update their weight (As it should have been aligned with datetime but I can’t show different days so I add a window to let users enter the date when they want to update)
- The button to change the view between the charts of weight and BMI

TP3 Update

- The backtracking algorithm to recommend meals for users based on their intake calories and categories of food
    - The rule of recommendation:
        - recommend three food for each meal
        - three food belong to different categories
        - avoid to recommend food that belongs to the same category with the food that the user has taken in
        - the sum of calories of recommended food are within the target calories of each meal and no less than 50 calories
- User input text boxes with OOP
    - Click inside the box to activate it (mousepressed events)
    - Use the keypressed events to check the contents
    - Click outside of the box to inactivate the box and transmit the data