

Flab or Fab

I. Project Title and Team Members:

Project Title: Flab or Fab?

Team Members:

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GitHub Project Repository Link:

<https://github.com/nehabaddam/SDV-Project.git>

II. Goal and Objectives:

Abstract:

AI is rapidly integrating into various aspects of our world, contributing to its improvement. We hope to create a web application "Flab or Fab" which can serve as a preventative measure by providing users with insights into their health and lifestyle habits based on user input such as age, weight, height, and other lifestyle habits. In addition, the tool will have the option to redirect users to a page that visually demonstrates how these factors can contribute to obesity and help improve health literacy and encourage users to adopt healthy habits.

Motivation:

Given the rising incidence of diseases associated with obesity resulting from sedentary lifestyles and unhealthy habits, it is crucial to address this issue by providing people with AI-based tools to assess their health from the comfort of their homes without the need for hospital visits.

Furthermore, "Flab or Fab" can assist consumers in better grasping the complicated connection between lifestyle choices and health outcomes by illustrating the components that contribute to obesity. Individuals may be able to make beneficial changes in their lives as a result, lowering

their risk of acquiring obesity-related health issues. Finally, "Flab or Fab" demonstrates AI's potential to change healthcare by providing individualized and accessible solutions for better health outcomes.

Significance:

Obesity is a chronic disease with several causes that leads to excessive body fat accumulation. And obesity is linked to several serious life-threatening diseases like diabetes, hypertension, osteoarthritis, knee pain, hip issues, depression, mental health, and cancer which reduce the life expectancy in humans.[5]

Worldwide, obesity has nearly tripled in the last 50 years. The United States and Mexico have large numbers of teens and middle-aged people who are obese and thus leading to serious life-threatening diseases. Japan has taken decisive steps to ensure that the obesity level is at the lowest levels and thus Japan has successfully achieved the highest life expectancy of 84.3 years.[4]

Obesity can be easily controlled by educating the public and creating awareness about the advantages of maintaining a healthy weight by adopting healthy food habits, and daily importance of exercise and regular mindful eating, and adopting other methods like Meditation to reduce Stress rather than resorting to eating high-calorie junk food.

Though Obesity is a huge problem, there are no web applications that predict obesity levels and types. Many BMI calculators just calculate the Body Mass Index by taking in the height and weight of the user. For example, the Centre for Disease Control has developed an Adult BMI calculator, that does not predict obesity type.[2] Another such example is National Health, Lung, and Blood institutes Calculate Your Body Mass Index. [1]

So, with the help of Fab or Fab, they can determine their obesity score and can take important steps in reducing their obesity and maintaining a healthy weight and thus protecting themselves from serious life-threatening diseases and thus increasing their life expectancy.

Objectives:

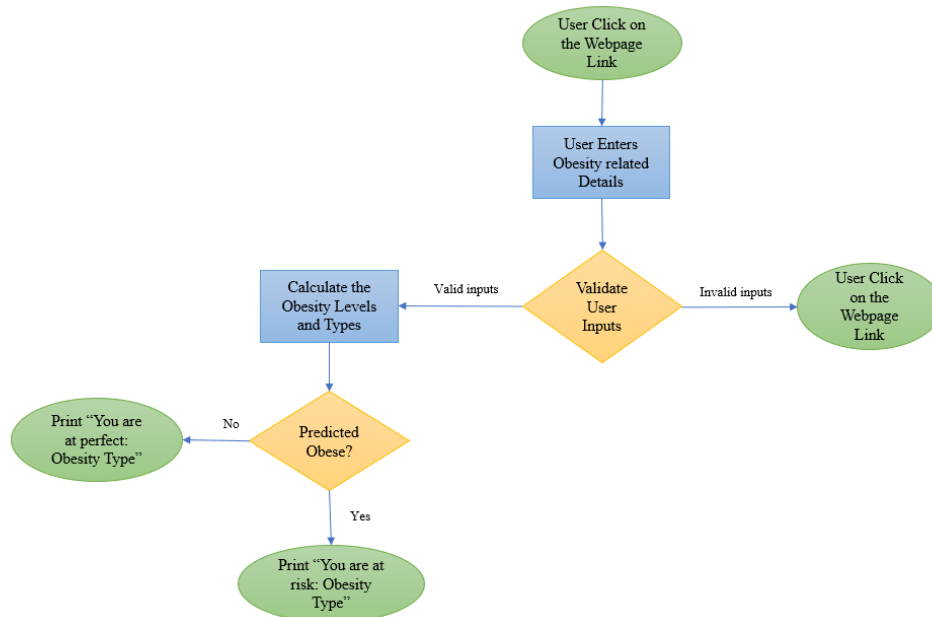
The primary aim of "Flab or Fab" is to gather information from users about the factors that contribute to obesity through a series of basic questions. This information is then used to calculate the user's risk of developing heart disease. Even if an individual is currently in good health, taking the assessment provided by "Flab or Fab" can help them determine their obesity score and make positive changes to their lifestyle to maintain or improve their health.

Workflow Diagram:

Ongoing research in the medical field has aimed to pinpoint the risk factors associated with obesity. Some factors that have been identified include genetics, overeating, a sedentary lifestyle, an unhealthy diet, medical conditions, medications, sleep deprivation, and stress. Despite progress in understanding these factors, there is still room for improvement in accurately predicting the risk of obesity and informing individuals about their health. [3] The "Flab or Fab" web application utilizes previous and current research data on these factors to predict the type of

obesity using AI algorithms and present the risk information to users in an easily understandable visual format.

Workflow Diagram for Obesity Type Prediction



Features:

The primary goal of "Flab or Fab" is to accurately predict an individual's obesity score. This is achieved by training the model using existing data and validating and testing it with the latest data available. Multiple models are tested to determine the one that produces the highest level of accuracy, which is then used to predict the risk factor for obesity. Once the model is trained, the website can be hosted to allow users to input their information dynamically, and the obesity score will be produced as output. Additionally, the tool will use visualization techniques to demonstrate how various factors contribute to obesity.

We are focusing on using the following classification models:

- SVM
- Naive Bayes
- Logistic Regression
- Decision Tree
- Random Forest

Input:

We are hoping to consider below inputs:

- Gender (Female, Male)
- Age (numeric)
- Height (numeric)
- Weight (numeric)
- family_history_with_overweight (Yes/No)
- FAVC: Whether the individual consume high-calorie food frequently (Yes/No)
- FCVC: Frequency of consumption of vegetables by the individual weekly (numeric).
- NCP: Number of main meals consumed by the individual per day(numeric).
- CAEC: Consumption of food between main meals (Yes/No).
- SMOKE: Whether the individual smokes tobacco (Yes/No).
- CH2O: Water consumption of the individual in liters per day (numeric)
- SCC: Whether the individual monitors their calorie intake (Yes/No)
- FAF: Physical activity level of the individual (numeric).
- TUE: Time spent by the individual on sedentary activities per day in hours(numeric).
- CALC: Consumption of alcohol by the individual (Yes/No).
- MTRANS: Mode of transportation used by the individual. (Automobile, Motorbike, Bike, Public_Transportation, Walking)
- NObeyesdad: Type of Obesity
(Insufficient_Weight,Normal_Weight,Overweight_Level_I,Overweight_Level_II,Obesity_Type_I,Obesity_Type_II,Obesity_Type_III)

Output:

A calculated obesity type and visual representation of how inputs contribute to obesity.

III. References:

1. [Adult BMI Calculator](#): This site uses Height and Weight to calculate the BMI.
2. [National Heart, Lung, and Blood Institute: Calculate your Body Mass Index](#): This site takes in Height and weight and visualizes the BMI chart for easy understanding.
3. [Obesity prediction using Machine Learning](#): This summary of machine learning algorithms provides a unique overview of the state of data analysis applied specifically to obesity.
4. [An Analysis of Indonesian Basic Health Research 2018](#): This article suggests multiple machine-learning techniques that predict obesity levels.
5. We are using an existing dataset for this project: [UCI Obesity Level Dataset](#)