# 1.4 problem formulation

# Problem Formulation:

Maintaining a healthy diet and exercise routine is essential in preventing many diseases and promoting overall well-being. However, many people struggle to meet their macronutrient goals and maintain a consistent exercise regimen without proper guidance and support. The current system for tracking macronutrient intake and exercise records has some limitations that need to be addressed to provide a comprehensive solution for users to achieve their fitness goals.

The limitations of the current system include a lack of individualized calculation of macros for users who engage in specific sports or activities, inadequate distribution of daily calories based on the number of meals per day, a lack of a 1 RM calculator to determine the appropriate weight for users to lift in the next set without risking injury, issues with maintaining a log file of exercise records, particularly related to past records from previous years, and an inability to handle exceptions and provide accurate results for out-of-range values.

The FitPlanner project aims to address these limitations by providing an interactive tool for users to monitor and evaluate their diets and exercise routines in line with their goals and the number of meals they consume. The project will include validation to provide accurate results and a more comprehensive solution for users to achieve their fitness goals. The potential implications of this project include promoting healthy diets and disease prevention, and improving the overall health and well-being of users.

# 1.5 Identification/Reorganization of Need

The need for the FitPlanner project stems from the growing concern around maintaining a healthy diet and lifestyle. While it is widely recognized that proper nutrition is crucial for disease prevention and optimal bodily function, many people struggle to meet their macronutrient goals due to a lack of guidance and support. The FitPlanner project aims to address this need by providing an interactive tool to help users monitor and evaluate their diets, with a particular focus on controlling their macronutrient intake in line with their goals and the number of meals they consume.

The current system for tracking macronutrient intake and exercise records has several limitations, including the use of the same formula for all users, which can result in incorrect calculations for those who engage in specific sports or activities. Additionally, the current system does not distribute daily calories based on the number of meals per day, which can impact the effectiveness of a user's diet plan. Furthermore, the lack of a 1 RM calculator to determine the appropriate weight for users to lift in the next set without risking injury is also a significant issue. The project also aims to address challenges related to maintaining a log file of exercise records, particularly related to past records from previous years. Finally, the current system does not handle exceptions and may provide results for out-of-range values.

To address these limitations, the FitPlanner project will provide validation to ensure more accurate calculations based on individual user needs, as well as a more comprehensive approach to designing meal plans and exercise routines. By providing users with personalized guidance and support, the FitPlanner project aims to promote healthy diets and disease prevention, helping individuals to achieve their fitness goals in a more effective and sustainable way.

# 1.6 Existing System

Existing System:

The current system for tracking macronutrient intake and exercise records has several limitations that the FitPlanner project aims to address. The macros are calculated with the same formula for all users, which can result in incorrect calculations for those who engage in specific sports or activities, such as football or endurance sports. Additionally, the current system does not distribute daily calories based on the number of meals per day, which can impact the effectiveness of a user's diet plan.

Furthermore, the current system lacks a 1 RM calculator to determine the appropriate weight for users to lift in the next set without risking injury. There are also issues with maintaining a log file of exercise records, particularly related to past records from previous years. Finally, the current system does not handle exceptions and may provide results for out-of-range values.

Overall, the limitations of the existing system make it challenging for users to achieve their fitness goals effectively. The FitPlanner project aims to address these limitations and provide a more comprehensive solution for users to achieve their fitness goals.

# Proposed System:

The proposed FitPlanner system aims to address the limitations of the existing system by providing a more comprehensive solution for users to achieve their fitness goals. The FitPlanner website will consist of a user-friendly interface that allows users to create a profile and customize their meal and exercise plans. The website will include the following features:

1. Macronutrient calculator: The macronutrient calculator will be tailored to each user based on their specific body composition, goals, and activity level. Users will be able to set the number of meals they eat per day, and the website will automatically distribute their daily calorie intake accordingly.
2. Exercise record tracker: The website will allow users to log their exercise records and track their progress over time. Users will be able to create a workout plan, and the website will suggest the appropriate weight for each exercise based on the user's previous performance.
3. 1RM calculator: The website will include a 1RM calculator that determines the appropriate weight for users to lift in their next set without risking injury.
4. Validation: The website will include validation to ensure that all user inputs are within a reasonable range and provide appropriate feedback when the input is out of range.
5. Responsive design: The website will be designed to be user-friendly and optimized for desktop and mobile devices.

The FitPlanner website will be developed using HTML, CSS, React, Django, and Python. The website will be tested for usability and functionality to ensure a seamless user experience. The proposed system aims to provide users with a more personalized and comprehensive solution to help them achieve their fitness goals and improve their overall health and well-being.

# 1.8 Unique Features of the System

The FitPlanner system offers several unique features that set it apart from other fitness tracking tools available in the market. These features include:

1. Customizable macronutrient calculations: FitPlanner allows users to input their specific sport or activity, which will be taken into account when calculating their daily macronutrient needs. This provides users with more accurate and personalized macronutrient goals to help them reach their fitness goals more effectively.
2. Meal planning based on number of meals per day: The system provides customized meal plans based on the number of meals a user intends to eat per day, which ensures that their daily calorie intake is distributed correctly across each meal. This feature can improve the effectiveness of a user's diet plan and help them meet their fitness goals.
3. 1 RM calculator: FitPlanner includes a 1 RM calculator that determines the appropriate weight for users to lift in the next set without risking injury. This feature is particularly useful for weightlifters and other strength training enthusiasts.
4. Log file of exercise records: The system provides a log file of exercise records that can be accessed by users at any time. This feature allows users to track their progress over time, identify areas of improvement, and set new goals for themselves.
5. Exception handling: The system includes a validation feature that handles exceptions and provides results for in-range values only. This ensures that users receive accurate and reliable information from the system.
6. Interactive tools: FitPlanner offers interactive tools, such as infographics and videos, to help users understand key health and fitness topics more easily. These tools can make the learning experience more engaging and enjoyable for users.
7. User-friendly interface: The FitPlanner website is designed to be user-friendly and visually appealing, making it easier for users to navigate and find the information they need. The website is also optimized for usability and functionality, ensuring a smooth user experience.

# 4.1 Introduction to Languages, IDE’s, Tools and Technologies used for Iementation

The FitPlanner website is developed using a range of languages, IDEs, tools, and technologies to provide a comprehensive solution for users to monitor and evaluate their diets and exercise routines. The following sections provide an overview of the technologies used in the FitPlanner website:

1. Front-end Technologies: The front-end of the website is developed using HTML, CSS, and React. HTML provides the structure of the website, while CSS is used to style the website's layout and appearance. React is used as the JavaScript library to create interactive user interfaces for the website.
2. Back-end Technologies: The back-end of the website is developed using Django and Python. Django is a high-level Python web framework that enables rapid development and clean, pragmatic design. Python is used as the programming language for developing the back-end.
3. Database: FitPlanner uses a PostgreSQL database to store user data such as macronutrient intake, exercise records, and other user information.
4. Testing and Quality Assurance: The website is tested for quality assurance using various tools and methods, including manual testing and user testing. Any errors or issues are addressed and corrected before deployment.

In summary, FitPlanner is developed using modern technologies and frameworks to provide a comprehensive solution for users to monitor and evaluate their diets and exercise routines. The website is designed to be user-friendly, visually appealing, and optimized for performance. The website uses Django and Python for the back-end, HTML, CSS, and React for the front-end, and PostgreSQL for the database.

# 4.2 Coding standards of Language used

The coding standards for the languages used in the FitPlanner project are critical for ensuring the maintainability, readability, and scalability of the codebase. The following coding standards have been adopted for each language used:

1. HTML/CSS: The HTML and CSS code should follow a consistent and logical structure. It should be well-formatted and use proper indentation to make it easy to read and understand. It should also use descriptive class names and IDs that accurately reflect the content they represent. Comments should be included to explain complex sections of code or to provide context for future developers. Additionally, CSS should be organized in a way that is easy to maintain and update, such as grouping similar styles together.
2. JavaScript/React: The JavaScript and React code should follow the Airbnb JavaScript Style Guide. This includes using semicolons, avoiding single-letter variable names, and using arrow functions. Code should also be properly indented and spaced to ensure readability. Descriptive variable and function names should be used, and comments should be included to explain complex sections of code or to provide context for future developers. Additionally, React components should be organized in a logical and modular manner to promote reusability and maintainability.
3. Python/Django: The Python and Django code should follow the PEP 8 style guide, which includes guidelines for formatting, naming conventions, and commenting. This includes using spaces instead of tabs for indentation, using descriptive variable and function names, and including comments to explain complex sections of code or to provide context for future developers. Code should also be properly structured, with functions and classes organized in a logical and modular manner to promote reusability and maintainability.

Adhering to these coding standards will ensure that the code is easy to read, understand, and maintain, making it easier for future developers to work with the codebase.

# 4.4 Testing Techniques and Test Plans

The testing process is an essential part of the FitPlanner project to ensure that the application functions correctly, meets the requirements of the users, and is reliable. The following testing techniques and test plans will be used for the FitPlanner project:

1. Unit Testing: This technique involves testing individual components of the application to ensure they are working correctly. It will be done by the developers during the coding process.
2. Integration Testing: This technique tests how the individual components of the application work together to ensure that they work as intended. It will be performed after the completion of unit testing.
3. System Testing: This technique tests the entire application as a system, verifying that all the features work together to meet the requirements of the users.
4. Acceptance Testing: This technique is performed by the users to verify that the application meets their requirements and expectations.

Test Plans:

1. Test Plan for Unit Testing: The developer will create a test plan for each component of the application to ensure that it functions as expected. It will include a detailed description of the test cases, including the inputs, expected output, and actual output.
2. Test Plan for Integration Testing: The integration test plan will include the order of integration and the testing of the integrated parts. This plan will also include the testing of data flow between the components.
3. Test Plan for System Testing: The system test plan will include the scenarios that will be tested, the data that will be used, and the expected results.
4. Test Plan for Acceptance Testing: The acceptance test plan will include the scenarios that the users will test, the data that will be used, and the expected results.

The FitPlanner project team will use these testing techniques and test plans to ensure that the application meets the needs of the users and is reliable. Regular testing will also be done during the development process to identify and address any issues that arise. The testing process will help to minimize the risk of errors and ensure that the application is of high quality.