A Major Project Report on

FitGeek: Modelling ML Based Recommendation System for fitness and wellness

B.E. - I.T Engineering

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CERTIFICATE

This to certify that the Mini Project report on **FitGeek: Modelling ML Based Recommendation System for fitness and wellness** has been submitted by Shreya Mahajan (20104001), Saniya Dutta (20104041) and Anish Bhosale (20104033) who are a Bonafide students of A. P. Shah Institute of Technology, Thane, Mumbai, as a partial fulfillment of the requirement for the degree in **Information Technology**, during the academic year **2023-2024** in the satisfactory manner as per the curriculum laid down by University of Mumbai.

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ABSTRACT

FitGeek, a revolutionary wellness platform, transcends conventional fitness websites by offering a transformative experience designed to empower individuals in their journey towards optimal health and fitness. This platform goes beyond generic solutions, providing personalized wellness recommendations tailored to individual needs, preferences, and objectives. FitGeek guides users every step of the way, ensuring their actions align with specific goals, thus enhancing the effectiveness of their fitness endeavors.

Moreover, FitGeek is dedicated to fostering continuous learning and growth among its users. By delivering the latest trends, research findings, and best practices in the wellness industry, FitGeek keeps users well-informed and up-to-date. It serves as a comprehensive resource, helping individuals make well-informed decisions about their health and fitness.

FitGeek is not merely a destination; it embodies a way of life. It encourages users to embrace the full spectrum of their well-being, take charge of their health, and lead lives that are not only healthier but also happier. Through its personalized approach, guidance, and commitment to continuous learning, FitGeek revolutionizes the concept of fitness platforms, making significant strides in promoting overall well-being.

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CHAPTER 1

Introduction

In the contemporary fitness landscape, health enthusiasts often encounter daunting challenges: the perilous pitfall of unreliable internet information and the economic constraints hindering access to proper guidance. Recognizing these obstacles, FitGeek steps forward as the beacon of a transformative solution. At FitGeek, we understand the aspirations of fitness enthusiasts and the hurdles they face in their quest for a healthier lifestyle. We have meticulously crafted a platform that empowers fitness geeks with knowledge and dynamic animated exercises, effectively bridging the chasm between misinformation and economic barriers. Our mission is clear: to make fitness more accessible, safer, and attainable for everyone, regardless of their background or circumstances.

In a world where digital information overload often leads to confusion, FitGeek stands as a reliable source of accurate guidance. We recognize the need for a trustworthy platform where users can confidently pursue their fitness goals, free from the shackles of misinformation. FitGeek offers precisely that—a sanctuary of authentic, reliable information right at the users' fingertips.

Central to FitGeek's ethos is the belief in the power of knowledge. We empower our users to make informed decisions about their fitness journey. On our platform, users can delve into targeted workouts, honing in on specific muscle groups, and master corresponding exercises through detailed animations. FitGeek serves as a guiding light, illuminating the path to fitness success with clear, precise, and expert-backed information.

FitGeek’s vision extends beyond just individual empowerment; it encompasses a commitment to creating an inclusive fitness community. By bridging the gap between unreliable fitness information and the economic constraints that often hinder access to proper guidance, FitGeek ensures that the journey to fitness is traversable by all. Our platform stands as a testament to the idea that with the right knowledge and resources, anyone can embark on a fitness journey confidently and safely.

Join us at FitGeek, where empowerment meets expertise, and let us guide you toward a healthier, happier, and more fulfilling life. Together, we redefine the standards of fitness accessibility and reliability, fostering a community where everyone can thrive.

CHAPTER 1.1

Purpose

The purpose of FitGeek is to revolutionize the fitness landscape by addressing the dual challenges faced by health enthusiasts worldwide: the proliferation of unreliable internet information and the economic constraints that hinder access to proper fitness guidance. FitGeek is driven by a profound commitment to empower individuals, irrespective of their backgrounds or circumstances, with the knowledge and tools necessary to embark on a safe, effective, and fulfilling fitness journey.

Our primary purpose is to democratize fitness education. In an era where misinformation spreads rampantly across digital platforms, FitGeek serves as a beacon of accuracy and reliability. By providing meticulously curated, evidence-based information, we enable users to make well-informed decisions about their health and fitness. FitGeek aims to dismantle the barriers of uncertainty, ensuring that every fitness enthusiast can navigate their journey with confidence and assurance.

Another core purpose of FitGeek is to enhance accessibility. Economic constraints should never stand as barriers to well-being. FitGeek strives to level the playing field by offering a wealth of resources, including detailed animated exercises and expert guidance, completely free of charge. By making high-quality fitness education accessible to all, FitGeek promotes a culture where individuals from diverse socio-economic backgrounds can actively participate in their own health and wellness.

Furthermore, FitGeek aims to foster a sense of community and belonging. Through our platform, we connect like-minded individuals, creating a supportive environment where users can share their experiences, challenges, and triumphs. This sense of community reinforces the belief that fitness is not an isolated journey but a collective endeavor, where encouragement and support play pivotal roles.

CHAPTER 1.2

PROBLEM STATEMENT

In today's fitness landscape, a critical dilemma plagues health enthusiasts worldwide. The pervasive reliance on irrelevant or inaccurate fitness information and misguided workout plans sourced from the internet poses a significant threat to individual well-being. This widespread dependence on internet resources often leads to a perilous situation where individuals engage in workouts that are not tailored to their body types, risking serious injuries and ineffective fitness outcomes. Moreover, the lack of personalized guidance exacerbates the problem, hindering the attainment of fitness goals for many.

Adding to the complexity of the issue is the economic barrier that obstructs access to proper fitness guidance. A considerable portion of the population finds it economically unfeasible to invest in personalized fitness programs or expert advice, leaving them in a state of perpetual uncertainty regarding their fitness endeavors

CHAPTER 1.3

OBJECTIVES

The main goals of the " FitGeek: Modelling ML Based Recommendation System for fitness and wellness " project can be summarized as follows:

• **To Provide Convenient and Economical Fitness Guidance**: To offer affordable and easily accessible fitness guidance.

• **To Offer Instructional Exercises with Animations**: To provide exercises with clear instructions, animated demonstrations and on a timer.

• **To Raise Awareness About Healthcare Updates**: To inform and raise awareness about recent healthcare updates.

• **To Enable Remote Access to Exercises and hydration calculator**: To facilitate remote access to exercises via web.

• **To Implement Disease Predictors**: To include disease predictors for conditions like diabetes and stress, along with relevant recommendations.

• **To Offer Personalised Diet Recommendations**: To provide tailored diet recommendations based on the person’s body statistics.

• **To calculate stress levels of the user**: To create a tab where the user can get access to various mental health practices.

CHAPTER 1.4

SCOPE

- **Enhanced Fitness Progress**: AI-powered recommendations adapt as users progress, ensuring optimal workout plans.
- **Calorie Intake Tracker and Analysis**: Implement algorithms for analysing calorie intake against individual goals and dietary preferences.
- **Personalised Diet Plans**: Incorporate nutritional analysis to ensure users receive balanced and tailored dietary recommendations.
- **Hydration Calculator**: Develop a hydration calculator that calculates daily water intake needs based on user profiles, activity levels, and environmental conditions.
- **Stress Level Assessment**: Implement stress assessment tools, such as surveys or wearable device integrations, to measure users' stress levels.
- **Mental Health Practices**: Integrate mental health practices, including mindfulness and meditation exercises and offer guided sessions and resources to improve mental wellbeing.
- **User Engagement and Tracking**: Implement tracking features to monitor users' adherence to recommendations and progress towards wellness goals.

CHAPTER 2

LITERATURE REVIEW

Data collected by fitness trackers could play an important role in improving the health and well-being of the individuals who wear them. Many insurance companies even offer monetary rewards to participants who meet certain steps or calorie goals. However, in order for it to be useful, the collected data must be accurate and also reflect real-world performance. As a result, it is difficult to use such measurements as an accurate predictor of health outcomes, or to develop a consistent criteria to rate the performance of such devices in head-to-head comparisons.

YEAR	AUTHOR	TITLE	OUTCOME	DRAWBACK
2022	Ajitesh Sharma; Yatin Pandey	Design and implementation of fitness management website	Member will have various attractive features on website like online music for the workout, online payment, also a noteworthy questionnaire having feature with the assistance of AI.	Developing a fitness SPA is a complex and expensive task with potential security and scalability issues, as well as business challenges such as marketing, and customer support.
2022	Chi Zhang; Xiaoli Hu	Prediction of New Media Communication of Fitness Culture and Its Influence Factors	Factors influencing fitness video communication on Bilibili include theme, subtitles, duration, fan base, uploader gender, and nationality.	Fitness videos on Bilibili with weight loss themes and videos with subtitles have lower communication effectiveness
2020	Parinaz Bulky	A multipurpose sensor based system for weight training	Device monitors weight and user activities by using IMU using algo of LDA and SVM	Requires external hardware devices
2020	Ching-Ting Hsu	Implementation of IoT Device on Public Fitness Equipment for Health Physical Fitness Improvement	IoT architecture for public fitness equipment improves physical fitness by providing efficient exercise and personalized prescriptions.	IoT architecture for public fitness equipment may be expensive to install and maintain and require technical knowledge to use effectively..
2017	Dipankar Das; Shiva Murthy Busetty	Strength Training: A Fitness Application for Indoor Based Exercise Recognition and Comfort Analysis	Automatic indoor exercise recognition and comfort analysis system with 95.3% accuracy for activity recognition and 99.4% accuracy for repetition count.	Automatic indoor exercise recognition and comfort analysis system may be expensive, require wearable devices, and have accuracy issues depending on the quality of the devices and the user's technique

CHAPTER 3

PROPOSED SYSTEM

The proposed system, FitGeek, is a cutting-edge, integrated wellness platform designed to revolutionize the way individuals approach fitness and well-being. FitGeek leverages advanced technology to provide personalized, convenient, and economical fitness guidance, ensuring users have access to accurate information, tailored exercise routines, and comprehensive health resources. The platform's multifaceted approach addresses physical and mental well-being, offering a holistic solution for users' fitness journey.

FitGeek's architecture is designed for scalability, ensuring seamless user experiences across devices. The system comprises three main components: a user-friendly frontend interface, a robust backend server, and a secure database. These components interact through RESTful APIs, enabling smooth data flow and real-time updates.

FitGeek boasts an intuitive, aesthetically pleasing interface developed using modern web technologies. The responsive design ensures a consistent experience on desktops, tablets, and smartphones. The dashboard serves as the users' central hub, featuring personalized workout plans, nutrition guides, mental health resources, and progress tracking tools. Clear navigation menus and interactive elements enhance user engagement, guiding them effortlessly through the platform's features.

FitGeek's core functionality revolves around personalized fitness guidance. Users input their goals, body measurements, and preferences, enabling the platform to generate tailored workout routines. These routines include detailed instructions, animated demonstrations, and timers, ensuring users perform exercises correctly and safely. Integration with wearable devices allows real-time tracking of activities, enhancing accuracy and providing instant feedback to users.

FitGeek's content section is a treasure trove of knowledge. Articles, videos, and infographics curated by health experts keep users informed about the latest healthcare updates, fitness trends, and wellness practices. Push notifications and newsletters alert users to new content, fostering continuous learning and awareness.

CHAPTER 3.1

FEATURES AND FUNCTIONALITY

- Personalized Fitness Plans: Tailored workout routines and diet recommendations based on individual goals and preferences.
- Interactive Exercise Demos: High-quality animations demonstrating correct exercise techniques for safe and effective workouts.
- Real-time Activity Tracking: Integration with wearable devices for monitoring steps, calories, and heart rate in real-time.
- Nutrition Guidance: Access to a nutrition database, recipes, and grocery lists for informed dietary choices.
- Hydration Calculator: Intelligent tool providing personalized hydration recommendations based on activity levels and weather.
- Health & Wellness Content: Curated articles, videos, and infographics on fitness, nutrition, mental health, and wellness trends.
- Disease Prediction: Predictive algorithms assessing health data, offering personalized recommendations and preventive measures.
- Stress Management Toolkit: Stress assessment tools, meditation exercises, relaxation techniques, and mental health practices.
- Community Engagement: Forums, chat support, and content sharing for user connection, motivation, and support.
- Progress Tracking: Visual charts and analytics to monitor progress in workouts, nutrition, and mental health activities.
- Secure Data Management: Robust encryption, secure login, and privacy measures ensuring user data confidentiality.

CHAPTER 4

REQUIREMENT ANALYSIS

- Users should be able to create personalized profiles, including fitness goals and preferences.
- The platform should generate customized workout plans targeting specific muscle groups, intensity levels, and duration based on user inputs.
- Clear instructions and interactive animations demonstrating exercises for effective and safe workouts.
- Integration with wearable devices for real-time monitoring of steps, calories, and heart rate.
- Nutrition guidance, offering personalized meal plans, recipes, and grocery lists aligned with user preferences.
- A hydration calculator that considers physical activity, weather conditions, and individual needs for optimal water intake.
- Stress management tools, including stress assessment features and relaxation techniques.
- Community engagement features like forums and chat support for user interaction and support.
- Progress tracking tools, including visual charts and analytics for workouts, nutrition, and mental health activities.
- Intuitive user interface ensuring seamless navigation and user engagement.
- Responsive design enabling access across various devices, including desktops, tablets, and smartphones.
- High-quality animations and multimedia content for effective learning and user engagement.
- Secure user data management, including encryption and privacy measures.
- Reliable and scalable backend infrastructure to handle user data and application demands.

CHAPTER 5

PROJECT DESIGN

CHAPTER 5.1

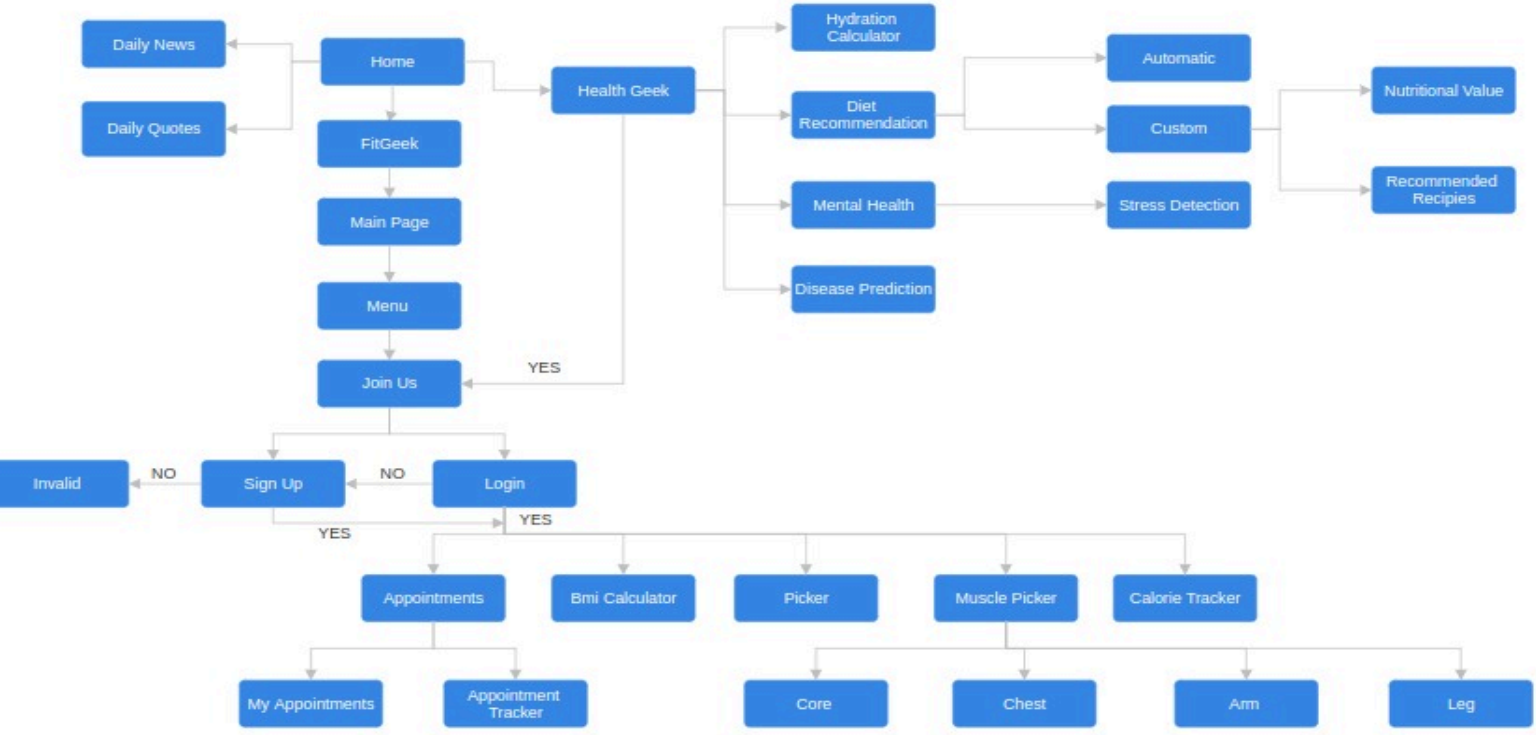
USE CASE DIAGRAM

CHAPTER 5.2

DATA FLOW DIAGRAM

CHAPTER 5.3

SYSTEM ARCHITECTURE



CHAPTER 6

TECHNICAL SPECIFICATIONS

Frontend : WEB X.O

1. HTML : for structure
2. CSS : for styling
3. JavaScript : for interactive elements
4. Bootstrap : CSS framework for responsive and attractive designs

Backend:

1. Django : framework for web application development
2. Python : for backend logic

Libraries/Dependencies: DATA ANALYSIS

1. Pandas
2. Numpy
3. Matplotlib
4. Google Maps API, FastAPI

For ML related features:

1. Scikit-learn : for building disease prediction models.
2. TensorFlow or PyTorch : For building recommendation and machine learning models.
3. Streamlit : for Machine Learning models.

ML Algorithms:

1.K-Nearest Neighbors: for classification and regression tasks of the diet recommender.

2.Support Vector Machine: for classifying individuals into one of two classes: diabetic or non-diabetic, in the diabetes predictor.

3.Content-Based Filtering: for exercise recommendation system.

4.Natural Language Processing: to determine the stress levels of the user based on the inputs provided.

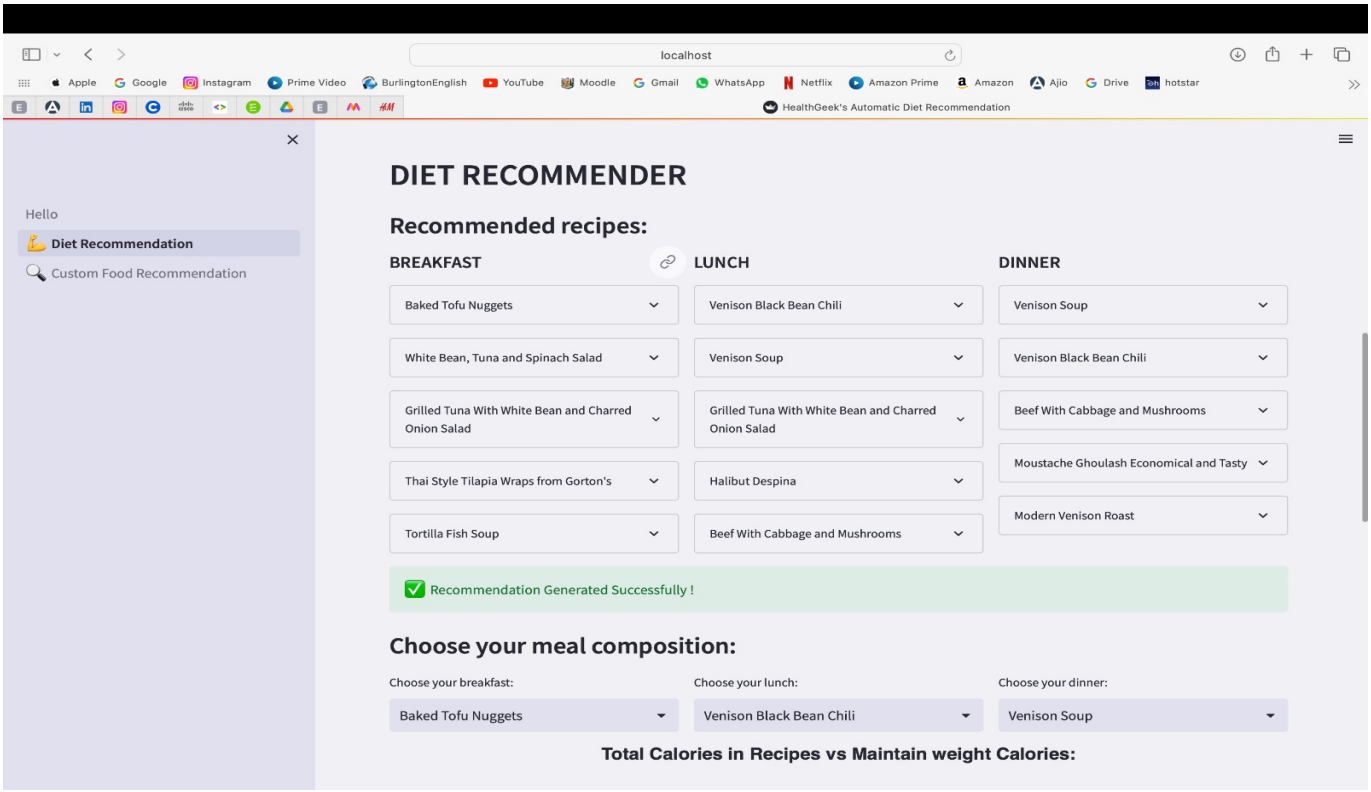
5.Logistic Regression: to predict stress levels categorised into different classes (e.g., low, moderate, high)

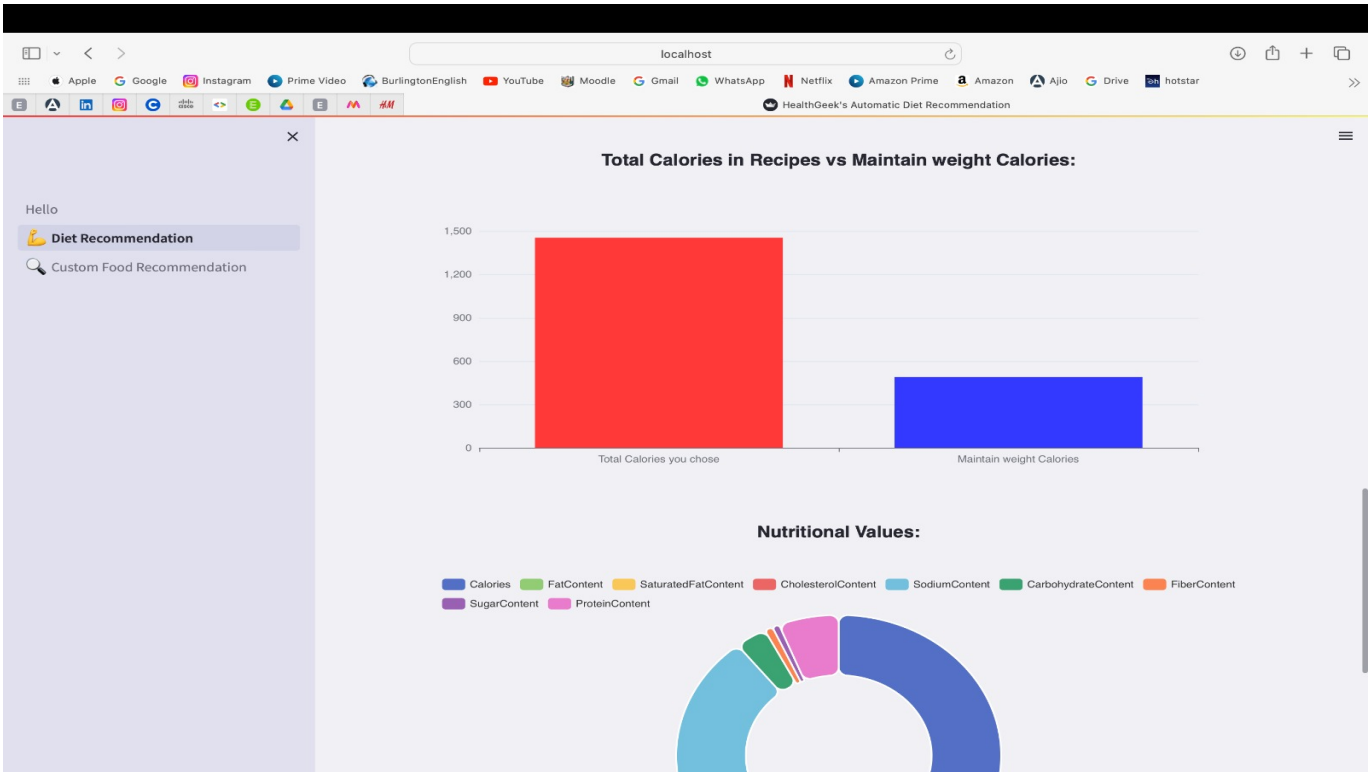
CHAPTER 7

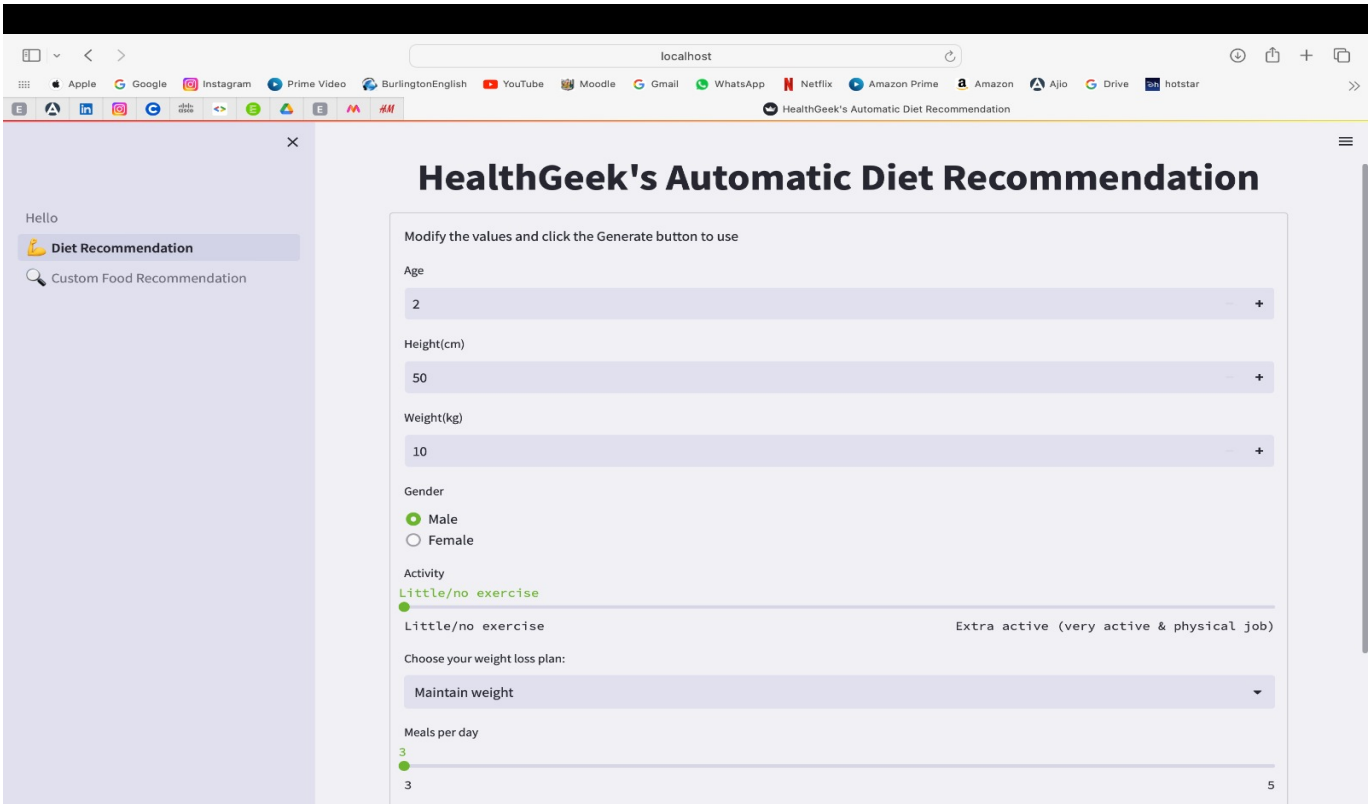
PROJECT SCHEDULING

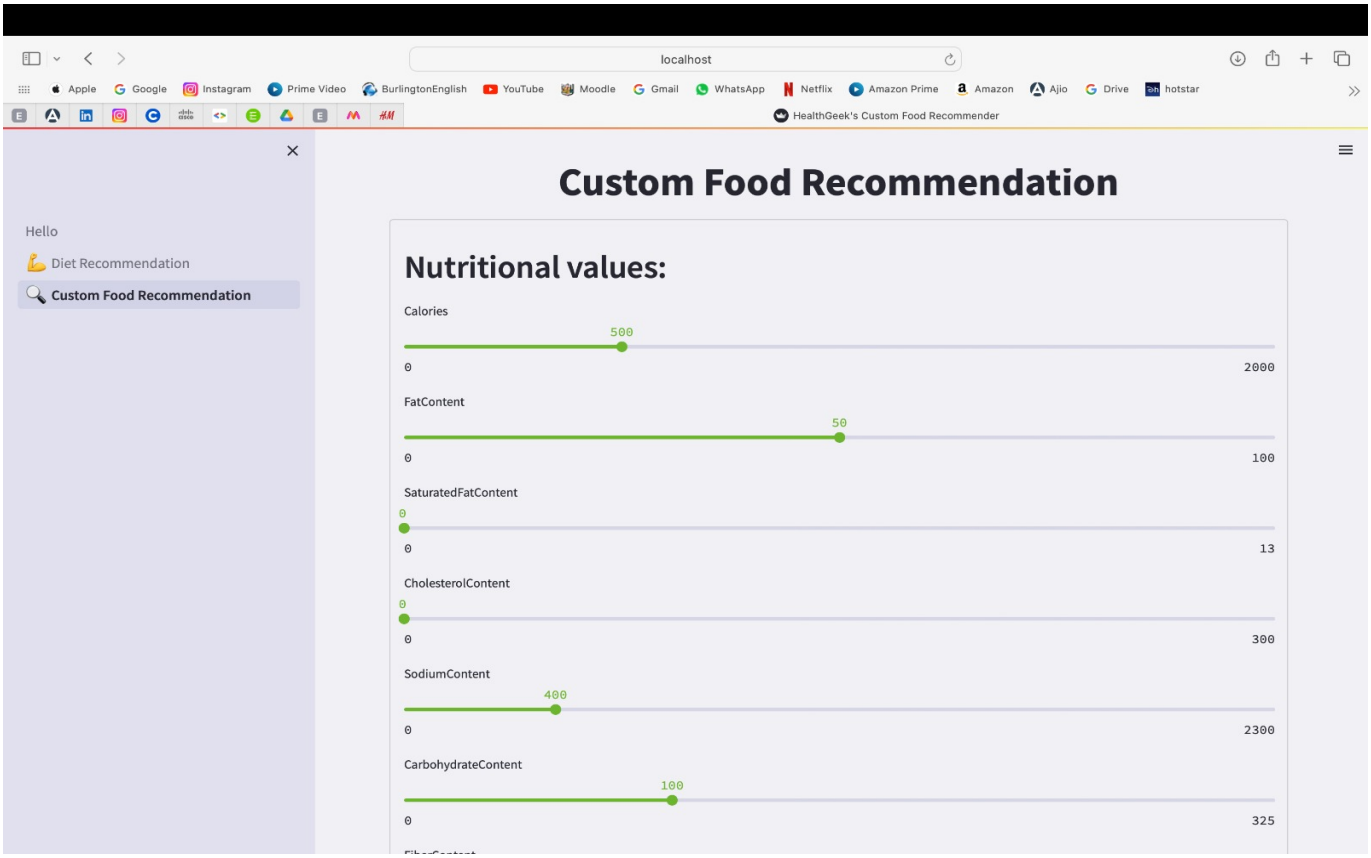
CHAPTER 8

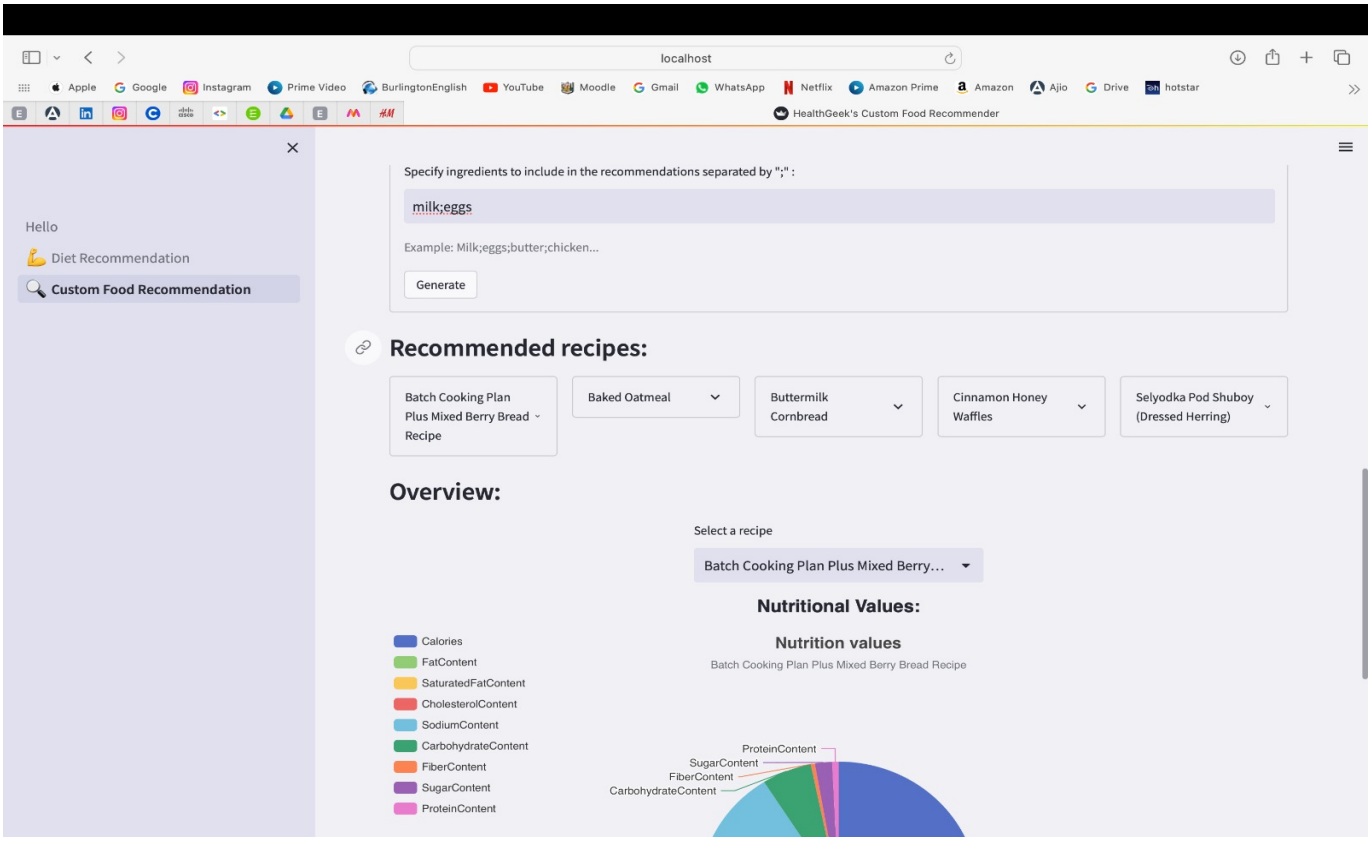
IMPLEMENTATION




localhost
HealthGeek's Automatic Diet Recommendation
Hello
Diet Recommendation
Custom Food Recommendation
Total Calories in Recipes vs Maintain weight Calories:
1,500
1,200
900
600
300
0
Total Calories you chose
Maintain weight Calories
Nutritional Values:
Calories
FatContent
SaturatedFatContent
CholesterolContent
SodiumContent
CarbohydrateContent
FiberContent
SugarContent
ProteinContent


localhost
HealthGeek's Automatic Diet Recommendation
Hello
Diet Recommendation
Custom Food Recommendation
HealthGeek's Automatic Diet Recommendation
Modify the values and click the Generate button to use
Age
2
Height(cm)
50
Weight(kg)
10
Gender
Male
Female
Activity
Little/no exercise
Little/no exercise
Extra active (very active & physical job)
Choose your weight loss plan:
Maintain weight
Meals per day
3
3
5


localhost
HealthGeek's Custom Food Recommender
Custom Food Recommendation
Hello
Diet Recommendation
Custom Food Recommendation
Nutritional values:
Calories
500
0
2000
FatContent
50
0
100
SaturatedFatContent
0
0
13
CholesterolContent
0
0
300
SodiumContent
400
0
2300
CarbohydrateContent
100
0
325


localhost
HealthGeek's Custom Food Recommender
Hello
Diet Recommendation
Custom Food Recommendation
Specify ingredients to include in the recommendations separated by ";" :
milk;eggs
Example: Milk;eggs;butter;chicken...
Generate
Recommended recipes:
Batch Cooking Plan Plus Mixed Berry Bread Recipe
Baked Oatmeal
Buttermilk Cornbread
Cinnamon Honey Waffles
Selyodka Pod Shuboy (Dressed Herring)
Overview:
Select a recipe
Batch Cooking Plan Plus Mixed Berry...
Nutritional Values:
Nutrition values
Batch Cooking Plan Plus Mixed Berry Bread Recipe
Calories
FatContent
SaturatedFatContent
CholesterolContent
SodiumContent
CarbohydrateContent
FiberContent
SugarContent
ProteinContent
ProteinContent
SugarContent
FiberContent
CarbohydrateContent

CHAPTER 9

RESULT AND DISCUSSION

Following the successful implementation of FitGeek, the platform has achieved remarkable milestones in empowering users on their fitness and wellness journeys. Users benefit from personalized workout plans, interactive exercise demonstrations, and real-time activity tracking. The integration of a nutrition guide, hydration calculator, and stress management toolkit has enabled users to make informed decisions about their health. FitGeek's community engagement features have fostered a sense of belonging, connecting like-minded individuals and promoting mutual support. Progress tracking tools have allowed users to visualize their fitness achievements, fostering motivation and determination.

FitGeek’s implementation has addressed the diverse needs of its users, providing a comprehensive, user-friendly, and secure wellness platform. The personalized features have resonated well with users, encouraging them to actively engage in their fitness routines. The platform’s emphasis on data security has instilled confidence among users, ensuring the safety of their personal information. FitGeek’s integration of social and interactive elements has transformed fitness into a communal experience, enhancing motivation and accountability.

The success of FitGeek can be attributed to its ability to bridge the gap between fitness enthusiasts and expert guidance, making wellness accessible to everyone. The seamless user experience and robust features have cultivated a loyal user base, contributing to the platform’s growth. FitGeek’s continuous updates and commitment to accuracy in content have further solidified its position as a reliable source of health and wellness information.

In conclusion, FitGeek has proven to be a transformative force in the wellness industry, providing users with the tools, knowledge, and support needed to lead healthier lives. As the platform continues to evolve, it remains dedicated to empowering individuals, fostering a global community centered around well-being, and redefining the way the world approaches fitness.

CHAPTER 10

CONCLUSION AND FUTURE SCOPE

Conclusion:

In conclusion, FitGeek stands as a testament to the transformative power of technology in the realm of health and wellness. Through personalized fitness plans, interactive tools, and a supportive community, FitGeek has successfully empowered individuals to take charge of their well-being. By bridging the gap between fitness enthusiasts and expert guidance, the platform has made fitness accessible, enjoyable, and safer for users worldwide. The implementation of advanced algorithms, real-time tracking, and comprehensive content has created a holistic ecosystem where users can embark on their wellness journey with confidence. FitGeek's commitment to accuracy, user experience, and data security has not only met but exceeded user expectations, making it a trusted companion in their pursuit of a healthier lifestyle.

Future Scope:

Looking ahead, FitGeek envisions a future of continuous growth and innovation. The platform aims to expand its repertoire of features, incorporating emerging technologies such as artificial intelligence and machine learning. Enhanced predictive analytics can provide users with more precise health insights, enabling proactive health management. FitGeek plans to collaborate with healthcare professionals, nutritionists, and mental health experts, further enriching the platform's content and guidance. Additionally, the integration of virtual reality (VR) and augmented reality (AR) can revolutionize workout experiences, making fitness routines more engaging and immersive.

FitGeek's future scope also includes global outreach, with plans to localize content and expand language support, ensuring that individuals from diverse cultural backgrounds can benefit from the platform. Community-building initiatives will be amplified, fostering stronger connections among users and promoting peer support.

Furthermore, FitGeek envisions partnerships with educational institutions to promote fitness education among youth, instilling healthy habits from an early age. Corporate wellness programs and collaborations with employers are on the horizon, encouraging healthier lifestyles among employees.

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