

NUTRIVISION
AI POWERED NUTRITION ANALYSER
A MINI-PROJECT REPORT

Submitted by

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BONAFIDE CERTIFICATE

Certified that this Thesis titled “**NUTRIVISION - AI POWERED NUTRTION ANALYZER**” is the bonafide work of “**SIVANANTHAM D (2116210701250), SANTHOSH M (2116210701233), GOPAL K (2116210701176)**” who carried out the work under my supervision. Certified further that to the best of my knowledge the work reported herein does not form part of any other thesis or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.

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ABSTRACT

The project aims to create an AI-powered nutrition analyzer for fitness enthusiasts to help them meet their health and fitness objectives through individualized nutrition insights and effective dietary tracking. The solution delivers personalized nutrition assistance based on modern AI technology, greatly improving customers' capacity to maintain their overall fitness levels. By offering real-time feedback and individualized information, the software helps users make informed dietary choices that enhance their fitness and overall health. For anyone dedicated to reaching their fitness objectives and upholding a healthy lifestyle, the AI-powered nutrition analyzer is a priceless tool thanks to the platform's user-friendly design and powerful data analysis features. The software facilitates long-term adherence to healthy eating habits and assists users throughout their fitness journey by combining sophisticated AI with an easy-to-use user interface. This comprehensive approach not only helps individuals reach their fitness goals, but it also encourages long-term lifestyle enhancements and overall health. Users receive ongoing guidance and individualized advice to help them make smart eating decisions that improve their overall health and fitness levels. With its combination of cutting-edge technology and useful usability, the AI-powered nutrition analyzer is a valuable tool for anybody committed to enhancing their fitness and nutrition. It helps them make long-term, beneficial improvements in their daily routines.

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First, we thank the almighty god for the successful completion of the project. Our sincere thanks to our chairman **Mr. S. Meganathan B.E., F.I.E.**, for his sincere endeavor in educating us in his premier institution. We would like to express our deep gratitude to our beloved Chairperson **Dr. Thangam Meganathan Ph.D.**, for her enthusiastic motivation which inspired us a lot in completing this project and Vice Chairman **Mr. Abhay Shankar Meganathan B.E., M.S.**, for providing us with the requisite infrastructure.

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CHAPTER 1

INTRODUCTION

In today's fast-paced society, the pursuit of health and fitness has become increasingly important for individuals hoping to live happy, fulfilling lives. However, it may be hard to navigate the complex world of exercise and nutrition, and it usually leads to confusion and discontent. In light of the need for a comprehensive strategy to address these challenges, we are excited to introduce our state-of-the-art health and fitness platform.

Our project's mission is to empower users on their path to optimum well-being by offering a selection of innovative modules that inspire, inform, and assist people in reaching their fitness and health objectives. Our platform seeks to transform the way people approach fitness and nutrition by utilizing cutting-edge technology and professional insights, making it simpler and more accessible for everyone to lead a better lifestyle.

Our platform's core consists of hundreds of interesting and educational articles that have been carefully chosen by fitness and nutrition specialists. Our articles address a broad range of subjects to inform and encourage readers on their journey toward wellness, from the most recent scientific findings to useful hints and recommendations. With just a few clicks, users of our nutrition analyzer module can learn important information about the nutritional value of various foods. Users can obtain comprehensive information about the macronutrient and micronutrient makeup of any food item by simply typing in its name. This information enables users to make well-informed dietary decisions that support their fitness and health objectives.

Use our user-friendly diet planner to take charge of your nutrition. Our personalized meal planning function makes it simple to prepare balanced, nutritious meals that are targeted to your dietary requirements and preferences, whether your goal is to gain muscle, lose weight, or just eat healthier overall.

A nutritious diet is not enough to help you reach your fitness goals; you also need to exercise consistently. Users can determine how many calories they will burn during an exercise based on their height, weight, gender, heart rate, and duration of activity by using our calorie burn calculator. This practical tool allows users to accurately track their caloric expenditure and adjust their exercise routines for optimal results.

1.1 PROBLEM STATEMENT

The challenge entails creating an AI-powered nutrition analyzer for fitness enthusiasts, revolutionizing dietary tracking and personalizing nutritional insights to optimize health and fitness goals effectively. The primary objective is to enable the AI with people to effectively fulfill their fitness and health goals by using this technology, which addresses the challenges of food tracking and provides personalized nutritional insights. Using AI technology, the platform will offer personalized insights, real-time feedback, and specific nutritional recommendations.

1.2 SCOPE OF THE WORK

By providing a comprehensive toolkit that enables users to attain optimal well-being, the health and fitness platform seeks to transform the concept of wellbeing. The website offers a wealth of information to help people make educated decisions about their diet and activity, including carefully chosen articles, a nutrition analyzer, a diet planner, and a calorie burn calculator.

1.3 AIM AND OBJECTIVES OF THE PROJECT

The project's goal is to create a nutrition analyzer using AI that is specifically designed for exercise lovers. It aims to offer individualized nutritional insights using cutting-edge algorithms, enabling users to successfully enhance their fitness and health objectives.

In order to achieve this goal, the project outlines a number of important goals. Its primary goal is to compile an extensive database of dietary data. It then aims to use AI algorithms to nutritional data analysis and interpretation, offering customized suggestions. The project's final goal is to provide an intuitive user interface enabling accessible and easy interaction.

1.4 RESOURCES

This project has been developed through widespread secondary research of accredited manuscripts, standard papers, business journals, white papers, analysts' information, and conference reviews. Significant resources are required to achieve an efficacious completion of this project.

The following prospectus details a list of resources that will play a primary role in the successful execution of our project:

- A properly functioning workstation (PC, laptop, net-books etc.) to carry out desired research and collect relevant content.
- Unlimited internet access.
- Unrestricted access to the university lab in order to gather a variety of literature including academic resources (for e.g. Prolog tutorials, online programming examples, bulletins, publications, e-books, journals etc.), technical manuscripts, etc.

1.5 MOTIVATION

The AI-powered nutrition analyser project is primarily driven by the increasing significance of fitness and health in modern society. People frequently experience uncertainty and disappointment when attempting to navigate towards optimal well-being due to the complicated nature of nutrition and exercise. The project uses cutting-edge technology and expert insights to accelerate the road to wellness in response to these difficulties.

CHAPTER 2

LITERATURE SURVEY

1. Nutrient Food Prediction Through Deep Learning : A man is only able to withstand malnutrition for so long. For people to lead fulfilling lives, they must consume a nutritious, well-balanced diet. To combat infectious diseases, humans need a strong immune system, particularly in light of the COVID-19 pandemic. One of the primary duties of a client is to identify items that are nutritious. Classifying agricultural products is vital to differentiate between conventional food and food that is high in nutrients because many of them are stored in large retail spaces. The real-time decision will inform the client by predicting items that are high in nutrients.

2. An Image-based AI Nutrition Analysis Platform for Food in Compartment Trays: The image-based AI nutrition analysis platform proposed in this research consists of two components: the food nutrition analysis system and the food picture collection system. The platform allows for the analysis of the nutrients in food contained in compartment trays. The food image collection system combines a depth camera and a Raspberry Pi microprocessor to gather images and depth information. Following collection, the information is moved to a cloud database so it may be analyzed.

3. Nutrient facts analysis using supervised learning approaches : People can achieve a healthy lifestyle by eating a diet rich in nutrients and balance. In the modern world, we are unsure of what foods are safe to eat and what are not; in other words, we are unsure of which foods are high in nutrients and which are not. All around the world, food goods are printed with nutritional data labels that follow a similar format. These nutritional facts include information on some of the main nutrients—like protein, carbs, and so forth—that are included in the food item. The general public finds it difficult to understand these nutrition data labels.

4. A Food Recommender System Considering Nutritional Information and User Preferences : According to the World Health Organization, one of the main problems is the general rise in non-communicable diseases, which includes cancer, diabetes, and early heart disease. It has been determined that one major contributing factor to many diseases is eating an unhealthy diet. In this setting, the topic of personalized nutrition emerges as a new avenue for research aimed at giving individuals customized dietary recommendations based on their physiological and physical characteristics as well as additional personal data.

5. SmartDiet — Personal wellbeing assistant and diet planner mobile service : The article highlights a cutting-edge smartphone app that combines diet planning and personal health assistant functions. People's standard of living could be considerably raised by the application field. The idea of building services on top of smart space technology is beginning to gain traction within academic and industry communities. These services contribute to the realization of traditional humans' desire for a simpler, easier life in terms of work, recreation, and housekeeping. The current smart space solution pilots streamline the management of corporate conferences and meetings, allowing attendees to concentrate on the core topic and purpose of the gathering.

6. Plan-Cook-Eat: A Meal Planner App with Optimal Macronutrient Distribution of Calories Based on Personal Total Daily Energy Expenditure: To prevent disease and death and to promote optimal health, it is essential to eat a diet high in nutrients, with the right proportion of macronutrients (fat, protein, and carbs) and the right amount of calories based on individual energy expenditure. This study suggested creating a web-based meal planner software called "Plan-Cook-Eat" that employs a parallel-iterative design technique to generate personalized diet plans based on the requirements of each user.

7. SCHOOLTHY: Automatic Menu Planner for Healthy and Balanced School Meals : Malnutrition is a common issue in today's world, and it is especially dangerous for young people. There is much space for improvement in terms of convenience and efficiency because, in our setting, nutrition experts create meal plans for kids that are both healthy and balanced by hand. Our main goal is to provide nutrient-dense, well-balanced meal plans that are affordable and offer a wide selection of foods and meal groups, while also meeting recommended daily intakes of energy and nutrients.

8. Design of Low Cost IoT enabled Calorie Tracker for Bicycle : Being fit is another reason why people ride bicycles. Fitness monitors that are sold commercially assist cyclists in monitoring their caloric expenditure and mileage. The issue with these fitness trackers is that their location and acceleration are primarily determined by smartphone sensors. This article suggests creating a digital speedometer for bicycles that incorporates safety features including location monitoring, speed alerts, and calorie counting. Any bicycle may be equipped with the system, which can also communicate data with a mobile phone via Bluetooth communication. The suggested system's architecture and design are covered in this paper. Tinkercad software was used to simulate the system.

9. DIY Activity Tracker: Count Your Calories More Accurately than a Smartphone : After restless pandemic lockdowns, many people were reminded of the significance of physical activity for both mental and physical health. As obesity has spread around the world and is already a pandemic in many places, even in the absence of lockdowns, it is now essential to assist people in managing their weight.

10. Image-based Thai Food Recognition and Calorie Estimation using Machine Learning Techniques : The goal is to enable individuals to keep themselves healthy and disease-free. Assessing food calories helps to assist consumers in determining their calories intake each meal, leading to a strategy that regulates the amount of

food they consume, and contributing to improve a control on nutrition consumption and weight loss.

11. Diet Planning Models Based on Linear Programming Theory for Catering Problems : Residents are becoming increasingly conscious of the significance of eating a balanced diet, which has brought attention to the catering issue. Dietary suggestions based on nutrients can provide workable solutions for the aforementioned issues. This work presents a dietary planning approach to determine the lowest dietary expenditure as long as diabetic patients' daily nutritional needs are satisfied and their nutrient intake stays within the upper limit. Using a robust mathematical model, we generate feasible plans for various socioeconomic classes and food types in order to provide as many feasible suggestions as possible.

12. Diet Plan and Home Exercise Recommendation system using Smart Watch : Sedentary lifestyles and obesity have become major global health concerns. This system offers a Diet Plan and Home Exercise Recommendation System (SYP) to address these problems. It creates tailored diet plans and exercise recommendations based on pathology information and user data from smartwatches.

13. CHARLIE - A Chatbot That Recommends Daily Fitness and Diet Plans : Maintaining a healthy diet and workout routine has become more difficult with the recent trend of working from home, making it even harder to manage a work-life balance. It has been demonstrated that skipping workout and nutrition regimens can have long-term negative impacts on one's health, such as obesity and shorter life spans. People currently plan their diets and exercise regimens around their schedules, which makes these chores difficult to stick to. Lack of time and planning causes users to abandon their ideas frequently.

14. CalNag - Effortless multiuser calorie tracking : Although self-tracking of food intake has been extensively investigated, there are still several obstacles to

overcome. Users of current systems frequently have to exert a great deal of effort, and attempts to lessen this effort have often produced poor accuracy or delays.

15. Diet and Exercise Tracking for Daily Requirements Using Artificial Intelligence Technique : Concerns regarding our appearance and fitness fanatics in today's society have surfaced recently. If one consumes more food than they need each day, they will eventually put on weight. The artificial intelligence (AI) model for calorie consumption regulation is presented in this inquiry. The AI model recommends the right amount of food and the exercises that should be done in order to burn off the excess calories. This inquiry has led to the conclusion that people can continue to consume any diet and engage in the daily physical activity required to maintain good health.

CHAPTER 3

SYSTEM DESIGN

3.1 GENERAL

In this section, we would like to show how the general outline of how all the components end up working when organized and arranged together. It is further represented in the form of a flow chart below.

3.2 SYSTEM ARCHITECTURE

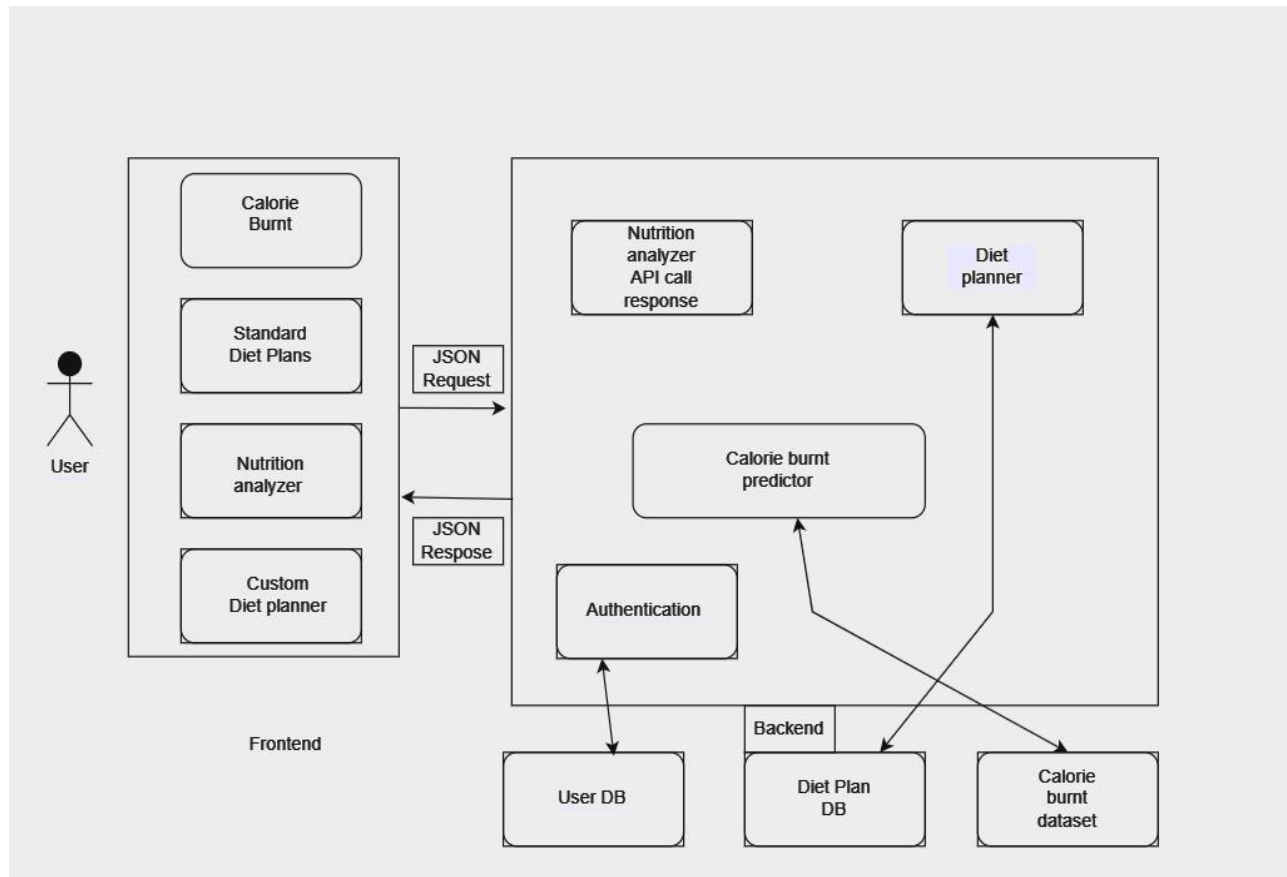


Fig 1 - System Architecture.

The architecture of the AI-powered nutrition analyzer is designed to deliver personalized insights and recommendations through three key frontend features: Calorie Burnt Predictor, Diet Planner, and Nutrition Analyzer. When a user interacts with any of these features, a JSON request is generated and sent to the backend. The Calorie Burnt Predictor utilizes a dataset stored in the database to predict the number of calories burned based on user activities, returning a JSON response with the prediction. The Diet Planner accesses diet plans from the database, allowing users to customize their dietary schedules and receive a JSON response with their personalized plan. The Nutrition Analyzer fetches data from an external API to provide detailed nutritional analysis and recommendations, ensuring that users receive the most current and comprehensive information. The backend processes each request accordingly: querying the database for the Calorie Burnt Predictor and Diet Planner, or interfacing with the external API for the Nutrition Analyzer. The JSON responses are then sent back to the frontend, where the information is presented in a user-friendly manner. This architecture integrates robust database management and API integration, facilitating efficient, real-time data processing and delivery.

3.3 DEVELOPMENTAL ENVIRONMENT

3.3.1 HARDWARE REQUIREMENTS

The hardware requirements may serve as the basis for a contract for the system's implementation. It should therefore be a complete and consistent specification of the entire system. It is generally used by software engineers as the starting point for the system design.

Table.1 Hardware Requirements

| COMPONENTS | SPECIFICATION |
|-------------------|-------------------------|
| PROCESSOR | Intel Core i5 |
| RAM | 8 GB RAM |
| GPU | NVIDIA GeForce GTX 1650 |
| MONITOR | 15” COLOR |
| HARD DISK | 512 GB |
| PROCESSOR SPEED | MINIMUM 1.1 GHz |

3.3.2 SOFTWARE REQUIREMENTS

The software requirements document is the specifications of the system. It should include both a definition and a specification of requirements. It is a set of what the system should rather be doing than focus on how it should be done. The software requirements provide a basis for creating the software requirements specification. It is useful in estimating the cost, planning team activities, performing tasks, tracking the team, and tracking the team’s progress throughout the development activity.

Eclips IDE, and **chrome** would all be required.

CHAPTER 4

PROJECT DESCRIPTION

4.1 METHODOLOGY

Our AI-powered Nutrition Analyzer for fitness enthusiasts was developed using a technique that aims to provide users with individualized nutrition insights to help them reach their fitness and health objectives. Motivated by the developments in artificial intelligence (AI), especially in the area of driverless vehicles, we concentrate on utilizing cutting-edge algorithms to evaluate food information and provide customized suggestions.

Our method involves gathering a diverse dataset of nutritional data from multiple sources, guaranteeing coverage of a broad spectrum of foods and dietary patterns frequently experienced by athletes. Our AI models are trained on this information, which enables them to analyze nutritional data and offer individualized insights.

Additionally, our technique highlights how crucial thorough data analysis is to guaranteeing the dependability and accuracy of the Nutrition Analyzer's recommendations. We want to be able to better help customers manage their overall fitness by gleaning useful insights from complex dietary data through the application of advanced algorithms.

Our ultimate objective is to provide a useful tool that helps people reach their fitness objectives and keep up a healthy lifestyle. Our Nutrition Analyzer uses artificial intelligence (AI) to provide customers with individualized advice and practical insights, enabling them to make decisions that will improve their fitness levels and overall health.

4.2 MODULE DESCRIPTION

4.2.1 Sign up and login.

The SignUp module enables users to create accounts by providing essential details such as username, email, and password. It ensures data security through password encryption techniques and includes verification steps like email confirmation for account validity.

The screenshot shows the 'Sign up' page of the 'Nutrition Analyser' application. At the top, there are navigation links for 'Nutrition Analyser' and 'Logout'. The main content area is titled 'Sign up' and contains a form with the following fields: 'Username' (with a placeholder 'username'), 'Email' (with a placeholder 'email'), 'Password' (with a placeholder 'password'), and 'Confirm Password' (with a placeholder 'confirm password'). Below the form, there is a link 'Already have an account, [Sign In](#)' and a red 'Sign Up' button. To the right of the form, there is a section titled 'Create account' with the subtext 'What will you get?'. This section lists three benefits: 'Unlimited read access of fitness article and blog posts.', 'Nutrition analyzer according to the food which you enter.', and 'Diet planer.' (sic). Below these, there is a link 'Calorie tracker based on your workout and diet.'

Fig 2 – SignUp Page

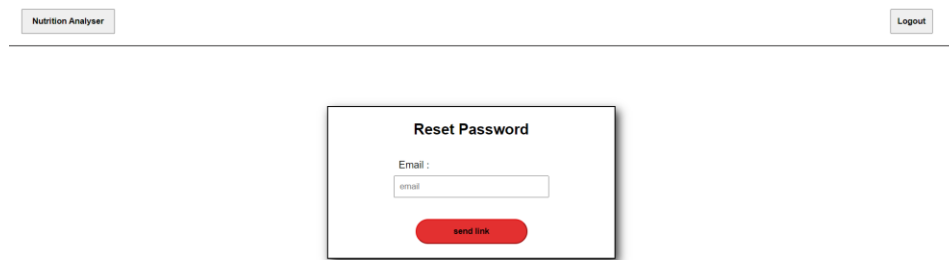
The login module facilitates user authentication, allowing registered users to access their accounts securely. It verifies user credentials, such as username/email and password, against stored data in the system's database.

The screenshot shows the 'Login' page of the 'Nutrition Analyser' application. At the top, there are navigation links for 'Nutrition Analyser' and 'Logout'. The main content area is titled 'Welcome Back!' and contains a form with the following fields: 'Email' (with a placeholder 'email') and 'Password' (with a placeholder 'password'). Below the form, there is a link 'Don't have an account, [Sign Up](#)' and a link 'Forgot your password ? [click here](#)'. At the bottom, there is a red 'Sign In' button.

Fig 3 – Login Page

4.2.1 Forgot password.

Enter the email address associated with your account. Check your inbox for an email from us with instructions on how to reset your password. If you don't see it, be sure to check your spam or junk folder. Click on the password reset link provided in the email.

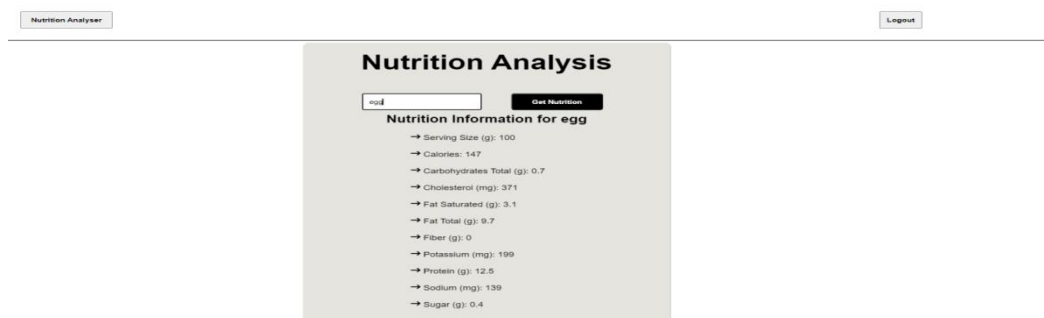


The screenshot shows a web interface with a header containing 'Nutrition Analyser' on the left and 'Logout' on the right. The main content area is a white box titled 'Reset Password'. Inside this box, there is a label 'Email:' followed by a text input field containing the placeholder text 'email'. Below the input field is a red button labeled 'send link'.

Fig 4 – Forgot Password Page

4.2.2 Nutrition analyser.

The Nutrition Analyzer module processes user-input, food data to generate detailed nutritional values, including carbohydrates, protein, fat, and glucose levels.



The screenshot shows a web interface with a header containing 'Nutrition Analyser' on the left and 'Logout' on the right. The main content area is a grey box titled 'Nutrition Analysis'. Inside this box, there is a text input field containing 'egg' and a black button labeled 'Get Nutrition'. Below these is the title 'Nutrition Information for egg' followed by a list of nutritional values:

- Serving Size (g): 100
- Calories: 147
- Carbohydrates Total (g): 0.7
- Cholesterol (mg): 371
- Fat Saturated (g): 3.1
- Fat Total (g): 9.7
- Fiber (g): 0
- Potassium (mg): 199
- Protein (g): 12.5
- Sodium (mg): 139
- Sugar (g): 0.4

Fig 5 – Nutrition Analyzer Page

4.2.3 Diets

The Standard Diet Plans module presents users with a curated selection of established diet plans tailored for various health objectives, including weight gain, weight loss, and balanced nutrition

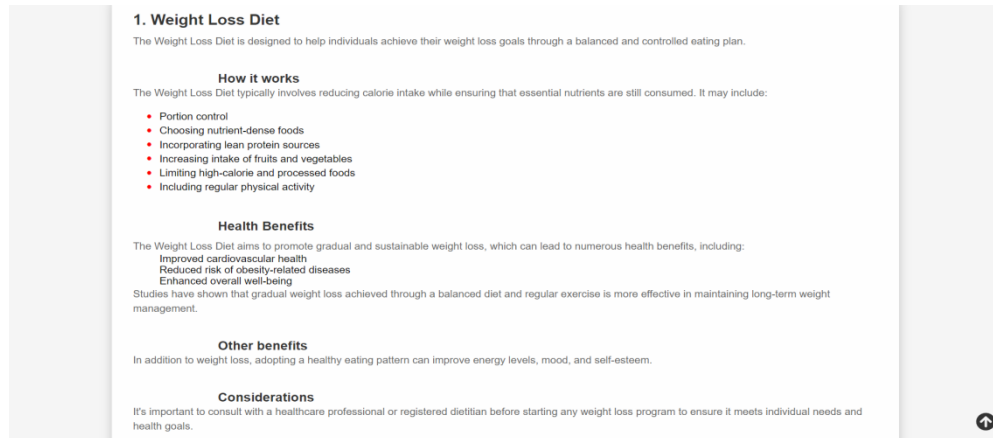


Fig 6 – Standard Diet Plan Page

4.2.4 Diet Planner.

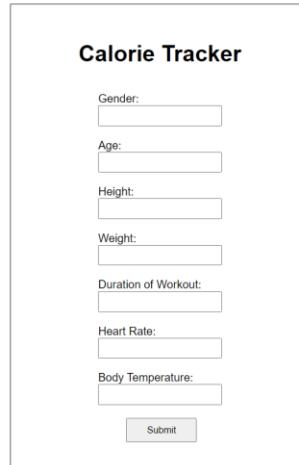
The Custom Diet Planner module empowers users to create personalized meal plans tailored to their preferences and dietary goals. Users can input their meal and snack preferences for each day of the week.

The screenshot shows the Diet Planner Page with a form to add a new diet plan. The form is titled 'Add new Diet-Plan : Add new' and contains four columns for meal types: Breakfast, Lunch, Dinner, and Snacks. Each column has input fields for each day of the week (Monday through Sunday). At the bottom of the form are 'Add Plan' and 'Cancel' buttons.

Fig 7 – Diet Planner Page

4.2.5 Calorie tracker

The Calorie Burn Predictor module employs the XGBoost Regressor (XGBRegressor) algorithm to estimate calorie expenditure during exercise.



The image shows a web form titled "Calorie Tracker". It contains seven input fields for user data: Gender, Age, Height, Weight, Duration of Workout, Heart Rate, and Body Temperature. Each field is a simple text box. Below these fields is a "Submit" button.

Calorie Tracker

Gender:

Age:

Height:

Weight:

Duration of Workout:

Heart Rate:

Body Temperature:

Fig 8 – Calorie Tracker Page

CHAPTER 5

RESULTS AND DISCUSSIONS

5.1 RESULT

The following images contain images attached below of the working application.

5.1.1 Welcome page

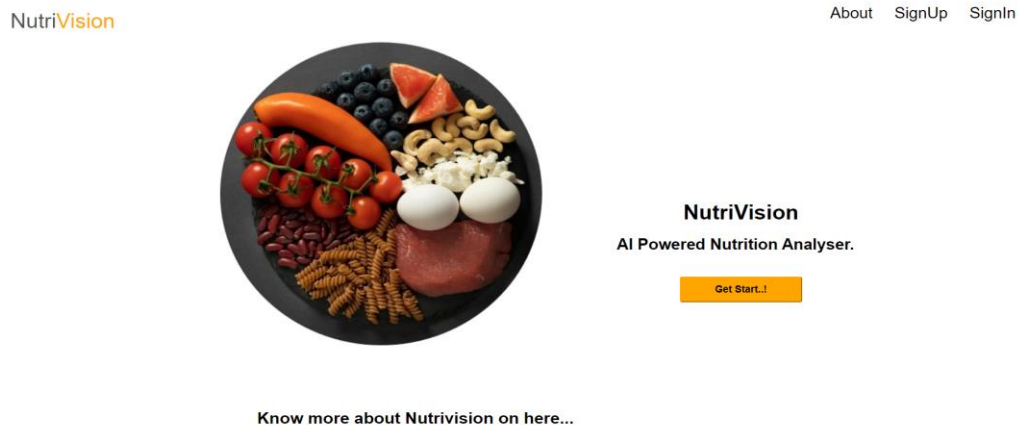


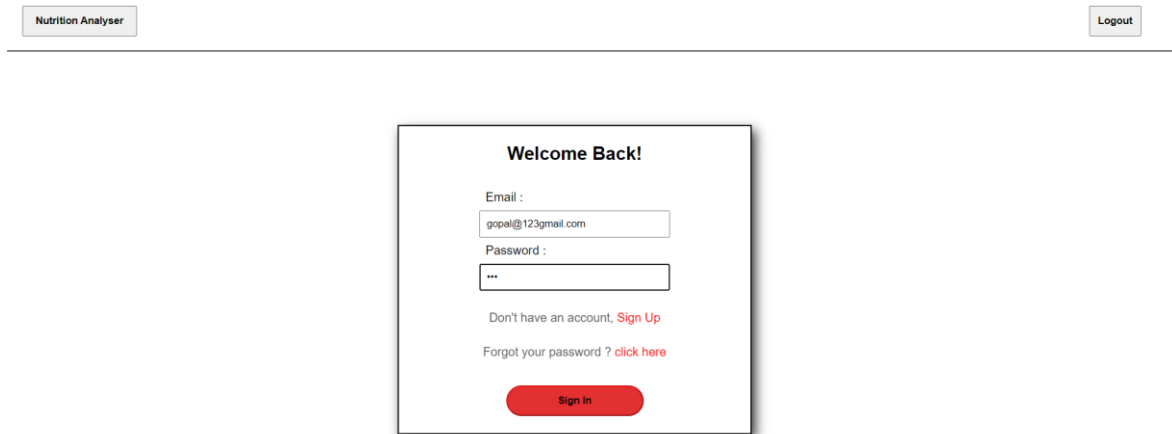
Fig 9 – This is the welcome page of our website in which the user can navigate to the sign-up page or sign-in page to access the nutrition benefits.

5.1.2 Sign up

The image shows the sign-up page of the application. It features a 'Sign up' form with fields for 'Username :', 'Email :', 'Password :', and 'Confirm Password :'. Below the form is a red 'Sign Up' button. To the right of the form is a 'Create account' section titled 'What will you get?' which lists four benefits: 'Unlimited read access of fitness article and blog posts.', 'Nutrition analyzer according to the food which you enter.', 'Diet planner.', and 'Calorie tracker based on your workout and diet.'. At the top left of the page is a 'Nutrition Analyser' button, and at the top right is a 'Logout' button. Below the sign-up form, there is a link that says 'Already have an account, Sign In'.

Fig 10 – The user need to sign-up if they are new to the website else they can skip this part and can sign-in directly.

5.1.3 Sign in page



The screenshot shows a web page with a header containing 'Nutrition Analyser' on the left and 'Logout' on the right. The main content is a 'Welcome Back!' sign-in form. It includes an 'Email' field with the text 'gopal@123gmail.com', a 'Password' field with three asterisks, and a red 'Sign In' button. Below the password field, there are links for 'Sign Up' and 'click here' for forgot password.

Nutrition Analyser Logout

Welcome Back!

Email :
gopal@123gmail.com

Password :

Don't have an account, [Sign Up](#)

Forgot your password ? [click here](#)

Sign In

Fig 11 – The user should sign-in to get nutrition insights and to track their fitness journey.

5.1.4 Home page

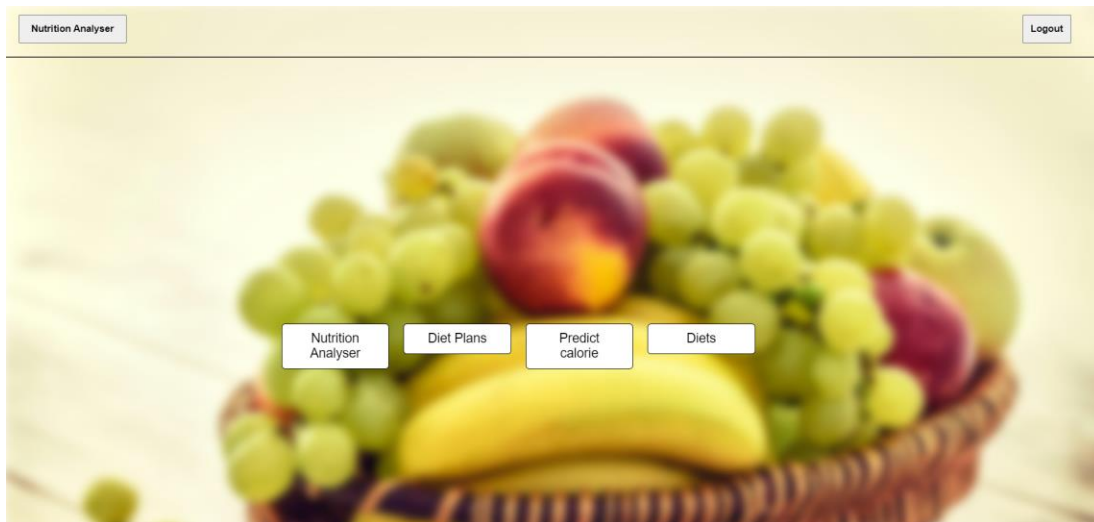


Fig 12 – All the features of our website were displayed here. The user can select the feature according to their needs.

5.1.5 Nutrition analysis

Nutrition Analyser

Logout

Nutrition Analysis

Get Nutrition

Nutrition Information for egg

- Serving Size (g): 100
- Calories: 147
- Carbohydrates Total (g): 0.7
- Cholesterol (mg): 371
- Fat Saturated (g): 3.1
- Fat Total (g): 9.7
- Fiber (g): 0
- Potassium (mg): 199
- Protein (g): 12.5
- Sodium (mg): 139
- Sugar (g): 0.4

Fig 13 – By typing the name of the food item user gets the nutritional information of that food item.

5.1.6 Nutrition analysis

Add new Diet-Plan :

Add new

Breakfast

Monday :

Tuesday :

Wednesday :

Thursday :

Friday :

Saturday :

Sunday :

Lunch

Monday :

Tuesday :

Wednesday :

Thursday :

Friday :

Saturday :

Sunday :

Dinner

Monday :

Tuesday :

Wednesday :

Thursday :

Friday :

Saturday :

Sunday :

Snacks

Monday :

Tuesday :

Wednesday :

Thursday :

Friday :

Saturday :

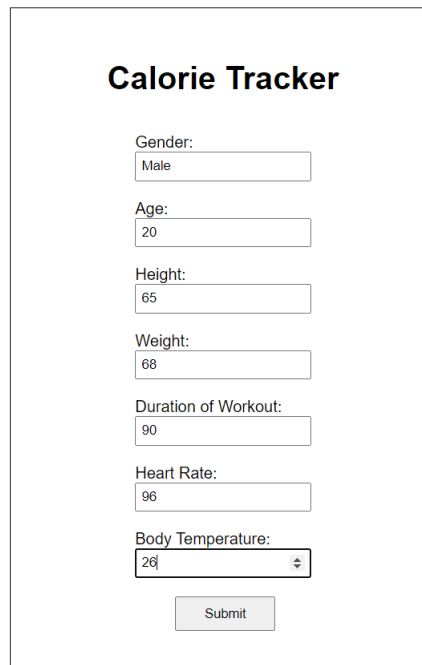
Sunday :

Add Plan

Cancel

Fig 14 – The user can make their own diet plan after analysing the nutritional information of food items.

5.1.7 Nutrition analysis



The image shows a web form titled "Calorie Tracker". It contains several input fields for user data: Gender (with "Male" selected), Age (20), Height (65), Weight (68), Duration of Workout (90), Heart Rate (96), and Body Temperature (26). A "Submit" button is located at the bottom of the form.

| Field | Value |
|----------------------|-------|
| Gender: | Male |
| Age: | 20 |
| Height: | 65 |
| Weight: | 68 |
| Duration of Workout: | 90 |
| Heart Rate: | 96 |
| Body Temperature: | 26 |

Fig 15 – By providing some details, user can track the calories burnt by following the diet plans.

5.2 DISCUSSION

Fitness and health enthusiasts have seen life-changing results from our project's completion, an AI-powered nutrition analyzer. Our dynamic platform revolutionizes nutritional tracking by providing individualized insights and recommendations to users who are working towards their wellness objectives. This is achieved through the rigorous development and application of cutting-edge AI technology.

The platform has received an immense amount of recognition for its extensive functionality and user-friendly interface since its launch. Consumers claim notable changes in their health, such as better digestion, more energy, and better weight management. People have been given the ability to make educated food decisions, which has resulted in long-term adherence to healthy habits and sustainable lifestyle improvements, by utilizing the power of real-time feedback and individualized insights.

The AI-powered nutrition analyzer has not only revolutionized how people monitor and control their eating habits, but it has also generated an empowering and supportive community. We are dedicated to enabling users to realize their maximum potential for health and fitness, one personalized recommendation at a time, as we continue to improve and optimize the platform.

CHAPTER 6

CONCLUSION AND FUTURE ENHANCEMENT

6.1 CONCLUSION

In conclusion, our AI-powered nutrition analyzer is leading the way in improving food monitoring for people who are passionate about their health and fitness. Our platform goes beyond conventional approaches by combining modern artificial intelligence (AI) with customized insights to provide personalized nutrition recommendations based on goals and needs. Through the provision of complete data analysis and real-time feedback, users are enabled to make smart nutritional choices that perfectly match with their fitness goals. Our system has advantages over just tracking meals, it promotes better health outcomes such as better digestion, more energy, and better weight management. In addition, people who manage their dietary intake also have increased fitness performance, which guarantees maximum efficiency during both workouts and rest periods. Our platform increases the effectiveness of goal achievement by making it easier to track progress and make dietary adjustments, which promotes long-term adherence to a healthy lifestyle. It guides users on a path to holistic well-being by encouraging harmony and balance in their diet, level of fitness, and general health. By adopting the platform's user-friendly interface and practical insights, people can fully realize their potential for health and fitness and set off on a journey of self-discovery.

6.2 FUTURE ENHANCEMENT

1. **Integration of Wearable Devices:** Additional information about users' activity levels, sleep habits, and general health state can be obtained by incorporating data from wearable devices, such as smart watches and fitness trackers. A more comprehensive approach for managing health and fitness will be made possible by integrating this data with the nutrition analyzer, which will provide individualized recommendations based on dietary consumption as well as individual activity levels and lifestyle choices.
2. **Meal Planning and Recipe Suggestions:** The process of converting dietary recommendations into feasible, daily meals can be improved by adding meal planning features and recipe ideas to the platform. It is simpler for users to stick to their nutrition objectives while still enjoying tasty and nutritious meals thanks to the database of healthy recipes that are catered to their dietary preferences and limits.
3. **Collaboration with Healthcare Professionals:** Forming alliances with healthcare professionals, such nutritionists, dietitians, and personal trainers, can improve the platform's efficiency and reliability. More individualized and coordinated care can be made possible by integration with electronic health records (EHRs), which can promote easy communication and data sharing between users and their healthcare professionals.

APPENDIX

1. Login & Sign up page:

```
import React, { useState } from 'react'
import axios from 'axios'
import './Signup.css'
import { useNavigate } from 'react-router-dom'
import { FaBookOpen } from "react-icons/fa";
import { IoFastFoodSharp } from "react-icons/io5";
import { RiCalendarScheduleFill } from "react-icons/ri";
import { FaPersonRunning } from "react-icons/fa6";

const Signup = () => {

  const navigate=useNavigate();
  const [errorMsg,setErrorMsg]=useState("");

  const [username,setUserName]=useState("");
  const [email,setEmail]=useState("");
  const [password,setPassword]=useState("");
  const [confirmPassword,setConfirmPassword]=useState("");

  const handleSubmit = (e)=>{
    e.preventDefault()
    if(password!=confirmPassword)
    {
      window.alert("password and confirm password must be same");
      return;
    }
  }
}
```

```

    }
    axios.post("http://localhost:4000/auth/signup",{
      username,email,password,confirmPassword
    }).then(res=>{
      console.log(res)
      if(res.data==="registered")
        navigate('/signin')
      else
        setErrorMsg(res.data)
    }).catch((err)=>{
      console.error(err);
    })
  }

  return (
    <div className='all'>
      <div className='signup'>
        <form className='signup-form' onSubmit={handleSubmit}>

          <center><h2>Sign up</h2></center><br />

          <label htmlFor="">Username :</label>

          <input type="text" required placeholder='username' value={username}
onChange={ (e)=>setUserName(e.target.value)} autoComplete='off' />

          <label htmlFor="">Email :</label>

          <input type="email" required placeholder='email' value={email}
onChange={ (e)=>setEmail(e.target.value)} autoComplete='off' />

```

```

    <label htmlFor="">Password :</label>

    <input type="password" required placeholder='password' value={password}
onChange={ (e)=>setPassword(e.target.value)} autoComplete='new-password' />

    <label htmlFor="">Confirm Password :</label>

    <input type="password" required placeholder='confirm password'
value={confirmPassword} onChange={ (e)=>setConfirmPassword(e.target.value)}
autoComplete='new-password' />

    <center><br /><p>Already have an account, <a href="/signin"
className='signin_anchor'>Sign In</a></p></center>

    {errorMsg?(<center><br></br><p>
style={{color:'red'}}>{errorMsg}</p></center>):""}

    <br /> <button type='submit'>Sign Up</button>

  </form>

</div>

<div className='allContent'>

  <p className='content'>Create account</p>

  <p className='content2'>What will you get?</p><br /><br /><br />

  <p><FaBookOpen /><span> </span>Unlimited read access of fitness article and blog
posts.</p><br /><br />

  <p><IoFastFoodSharp /> Nutrition analyzer according to the food which you
enter.</p><br /> <br />

  <p><RiCalendarScheduleFill /> Diet planer.</p><br /><br />

  <p><FaPersonRunning /> Calorie tracker based on your workout and diet.</p><br />

</div>

</div>

)) export default Signup

```

2. Nutrition analyser:

```
const Nutrition = () => {  
  const [food, setFood] = useState("");  
  const [nutritionData, setNutritionData] = useState([]);  
  
  async function fetchData() {  
    const options = {  
      method: 'GET',  
      url: 'https://nutrition-by-api-ninjas.p.rapidapi.com/v1/nutrition',  
      params: {  
        query: food  
      },  
      headers: {  
        'X-RapidAPI-Key':  
'57bdea98c8msh11726cb27834af0p12d8eejsn519597279ab3',  
        'X-RapidAPI-Host': 'nutrition-by-api-ninjas.p.rapidapi.com'  
      }  
    };  
  
    try {  
      const response = await axios.request(options);  
      setNutritionData(response.data);  
    } catch (error) {  
      console.error(error);  
    }  
  }  
}
```

```

function handleFood(e) {
  e.preventDefault();
  fetchData();
}
return (
  <div className='nutrition_analysis'>
    <h1 style={{ color:'black' }} className='title'>Nutrition Analysis</h1>
    <form onSubmit={handleFood}>
      <label htmlFor="input" className='lable' id="username"
name="username"></label>
      <br /><br />
      <input type="text" value={food} onChange={(e) => setFood(e.target.value)}
className='food-input' placeholder="Enter the Food :"/>
      <button type="submit" className='get-nutrition'>Get Nutrition</button>
    </form>
    {nutritionData.length > 0 && (
      <div className="nutrition-info">
        {nutritionData.map((item, index) => (
          <div key={index}>
            <h2>Nutrition Information for {item.name}</h2><br />
            <ul className='nutrition-info-list'>
              <li><FaArrowRightLong /> Serving Size (g):
{item.serving_size_g}</li><br />
              <li><FaArrowRightLong /> Calories: {item.calories}</li><br />
              <li><FaArrowRightLong /> Carbohydrates Total (g):
{item.carbohydrates_total_g}</li><br />
              <li><FaArrowRightLong /> Cholesterol (mg):
{item.cholesterol_mg}</li><br />

```

```

        <li><FaArrowRightLong /> Fat Saturated (g):
{item.fat_saturated_g}</li><br />
        <li><FaArrowRightLong /> Fat Total (g): {item.fat_total_g}</li><br />
        <li><FaArrowRightLong /> Fiber (g): {item.fiber_g}</li><br />
        <li><FaArrowRightLong /> Potassium (mg): {item.potassium_mg}</li><br
/>

        <li><FaArrowRightLong /> Protein (g): {item.protein_g}</li><br />
        <li><FaArrowRightLong /> Sodium (mg): {item.sodium_mg}</li><br />
        <li><FaArrowRightLong /> Sugar (g): {item.sugar_g}</li><br />
    </ul>
</div>
    )))
</div>
    )}
</div>
);
};

```

3. Calorie tracker:

```

const CalorieTracker = () => {
    const [gender,setGender]=useState("");
    const [age,setAge]=useState("");
    const [height,setHeight]=useState("");
    const [weight,setWeight]=useState("");
    const [duration,setDuration]=useState("");
    const [hrt,setHrt]=useState("");
    const [temp,setTemp]=useState("");
    const [calorie,setCalorie]=useState("");

```

```

const [showCal,setShowCal]=useState(false);
const [length,setLength]=useState(false);
const handleSubmit = (event) => {
  event.preventDefault();
  if(gender.length>0 && age.length>0 && height.length>0 && weight.length>0
    && duration.length>0 && hrt.length>0 && temp.length>0)
    setLength(true);
  axios.post('http://localhost:4000/model',{
    gender,age,height,weight,duration,hrt,temp
  } )
  .then((cal)=>{
    setCalorie(cal.data);
    console.log("predicted calorie : ",cal.data)
  })
  .catch((err)=>{
    console.log(err);
  })  };

```

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