A Project Report

on

A.I. DIETICIAN

Submitted in partial fulfillment of the

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B. TECH(CSE)

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Abstract

A new age of individualized dietary counselling and healthcare has begun as a result of the integration of Artificial Intelligence (AI) into the area of nutrition. The emerging discipline of the "Artificial Intelligence Dietician" (AID) is examined in this abstract along with its revolutionary potential for tackling the many problems associated with contemporary nutrition. Traditional nutritional advice frequently relies on general rules that don't take into account differences in each person's genetics, metabolism, lifestyle, and food preferences. This one-size-fits-all strategy can have detrimental effects on health, aggravating problems like obesity, chronic illnesses, and malnutrition. To offer individualized nutrition recommendations, AID makes use of the capabilities of AI, including machine learning, natural language processing, and data analytics. A person's particular requirements and aspirations may be taken into account when creating a personalized food plan using AID systems, which analyses large databases containing individual health profiles, dietary preferences, and biological indicators. Additionally, they regularly modify these suggestions when people's circumstances alter, assuring their continued applicability and efficacy.

Keywords: Artificial Intelligence, Dietician, Personalized Nutrition, Dietary Requirements, Innovative Solutions.

Title Page No.

Chapter 1- Introduction

The use of artificial intelligence (AI) has spurred innovation in a number of industries, including healthcare and nutrition, as we continue to search for easier and better ways to live. The AI Dietician, a ground-breaking use of AI and machine learning in the field of nutrition and diet planning, is one amazing example of this technical progress. AI dieticians mark a paradigm shift in how people approach and oversee their food decisions.

For a long time, traditional dieticians have been vital in helping people make better dietary choices and improve their general health. They are quite knowledgeable and skilled in interpreting nutritional needs, but their availability and one-on-one counselling are frequently in high demand. Conversely, AI dieticians offer individuals the best of both worlds: their 24/7 accessibility and indepth nutritional expertise, enabling them to get timely, data-driven guidance without being limited by time or place.

These AI-enabled dieticians provide highly customized suggestions by utilizing large databases and complex algorithms. They consider not just a person's dietary choices but also their particular lifestyle, health objectives, and even current variables like the temperature, the amount of exercise, and the seasonality of food availability. The end product is a comprehensive dietary plan customized to meet each person's needs, be they weight loss, chronic condition management, sports performance enhancement, or just eating a healthy, balanced diet.

Additionally, AI dieticians are able to continually track and adjust to alterations in an individual's nutritional needs and preferences. For instance, the AI Dietician may quickly modify its suggestions if a user chooses to follow a vegetarian diet, making sure that the person's nutritional needs are still satisfied. Compared to typical dietary programs that could become out of date when circumstances change, this flexibility is a huge advantage.

The AI Dietician is a promising example of a future where technology and nutrition combine to enable people to take control of their health and nutrition in a more effective and convenient way in this era of AI-driven innovation. AI and nutrition together provide previously unheard-of levels of cost, convenience, and individualised assistance, enabling consumers to make datadriven, wellinformed dietary decisions with more ease than ever.

The investigation into the revolutionary potential of AI dieticians has only just begun with this introduction. We will examine this cutting-edge technology's features, advantages, and drawbacks in further detail, highlighting the fascinating opportunities it presents for nutrition and wellbeing. AI dieticians have the power to completely change how we approach our diets and enhance our general health and wellbeing in the process.

Existing Problem

Although AI dieticians have a lot of potential and promise, there are a number of issues and difficulties that need to be resolved before they can be widely adopted and used. As we create and incorporate AI dieticians into healthcare and nutrition, these are crucial points to keep in mind. Among the issues that exist right now are:

1. Absence of Human Interaction: AI dieticians are inherently impersonal and empathetic, unlike human dieticians. Successful nutritional management requires a strong patientdietician relationship, which AI dieticians may not be able to provide. As a result, some patients may feel alone or less motivated to stick to their diet regimens.
2. Data privacy concerns: AI dieticians are dependent on gathering and evaluating enormous volumes of individual health and nutritional information. It is important to safeguard this sensitive information, and there are worries about data breaches or abuse that might have detrimental effects on an individual's security and privacy.
3. Insufficient Knowledge of Regional and Cultural Dietary Customs: AI Dieticians may find it difficult to take into consideration the wide range of dietary customs and cultural preferences that exist worldwide. They frequently depend on broad dietary recommendations, which may not be entirely consistent with local or cultural customs. This might lead to dietary suggestions that are impractical or disagreeable to certain people.
4. Complexity and Accessibility: Some users, especially those with low levels of technology literacy or poor internet connections, may find AI Dieticians to be too complicated to comprehend and operate. This accessibility issue may prevent some populations from taking use of the services provided by AI dieticians.
5. Reliability and Trustworthiness: Depending on the algorithms and data sources employed, AI dieticians' quality might differ greatly. Users could be sceptical of these systems' dependability and credibility, particularly when important nutritional choices are at issue.
6. Potential for Misdiagnosis: People may rely on AI dieticians to diagnose medical issues or provide dietary recommendations that should be given by healthcare professionals. However, AI dieticians are not a replacement for medical specialists. Delaying appropriate medical attention might have detrimental effects on one's health.

In order to guarantee that AI dieticians give a well-rounded and efficient approach to nutritional management while honoring individual requirements, privacy, and cultural diversity, it is critical to acknowledge and address these issues during the development and implementation phases. In the subject of AI dietetics, finding the ideal balance between technology innovation and individualized, morally complex, and culturally sensitive treatment is a constant problem.

A. Primary Objective

AI dieticians strive to create highly customised meal plans that take into account each person's unique dietary limitations, preferences, and health objectives. AI dieticians assist users in selecting diets that support their goals, whether they illness prevention, weight management, or basic nutrition, by customising advice to each individual's specific needs.

B. Scope

AI dieticians are in a good position to provide highly customised nutritional advice that takes into account each patient's unique dietary choices, limits, allergies, and health goals. The range includes basic nutritional assistance, improving sports performance, managing weight, and preventing chronic diseases.

AI dieticians are available around-the-clock to provide consumers with nutritional guidance and help anytime they need it. Dietary recommendations become more practical and inclusive when they are made accessible to a wider range of individuals with different schedules and lifestyles.

AI dieticians place a lot of emphasis on weight control, which covers muscle building, weight loss, and weight maintenance. To assist people in reaching their weight-related objectives, AI dieticians can provide individualised food planning and activity suggestions. In order to enhance dietary recommendations and outcomes, AI dieticians are involved in ongoing research and development that advances nutritional science and refines algorithms.

Technological developments, user desire for more convenient and personalised nutritional advice, and the increasing emphasis on health and nutrition in society are all driving changes in the role of AI dieticians. These AI-powered solutions are anticipated to significantly alter how people approach and manage their diets as they become more advanced and extensively used, eventually improving people's health and well-being.

Proposed Solution

This system is a graphical user interface application that answers questions from users. The user just has to complete the necessary fields for this system to function. The System makes advantage of worked-in counterfeit awareness to answer the query. The correct responses matched the user's questions. The user only needs to choose the correct answer from the list of options available to them if they decide that the given response is incorrect. The user can choose from five distinct categories of activities based on the system's requirements. The user may ask questions about any activity related to their diet plan by using the framework.

The framework uses comprised reasoning to answer the user's inquiry. In response, the framework presents an interesting graphical user interface (UI) that gives the impression that the user is conversing with a real person. The user of this programme may select the kind of diet plan that they want to follow.

This approach gives the understudy fresh perspective on the user actions. The proposed method would simply inquire of the user, who can be searching for an alternative kind of diet plan.

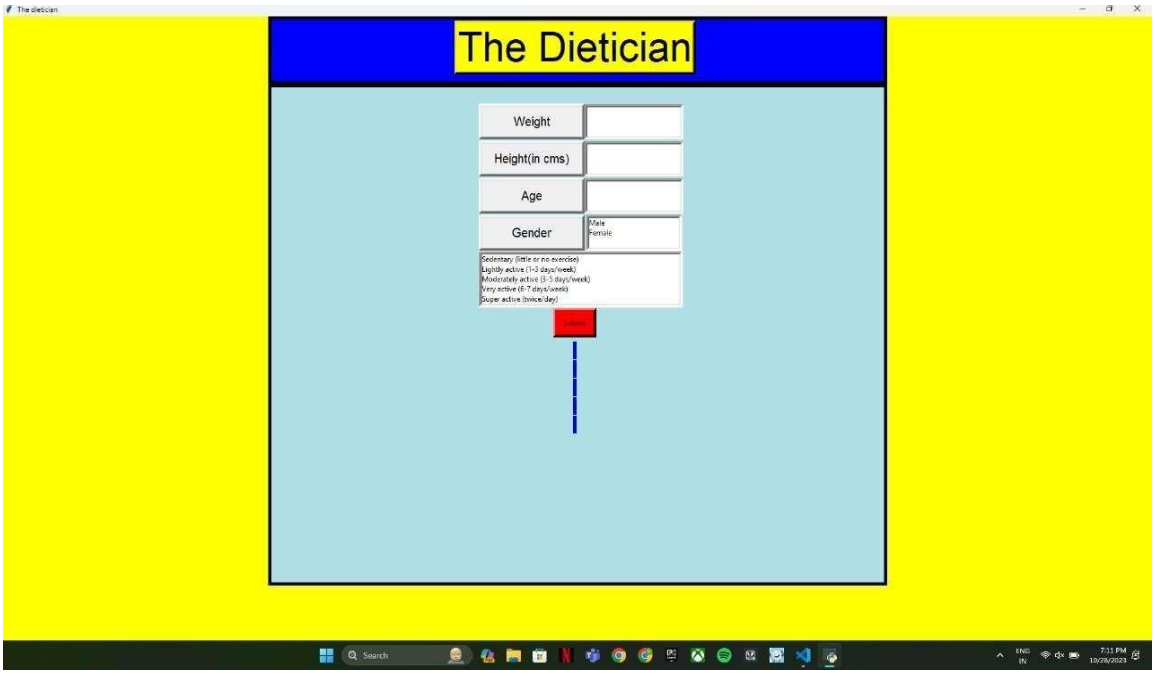


Fig: Graphical User Interface

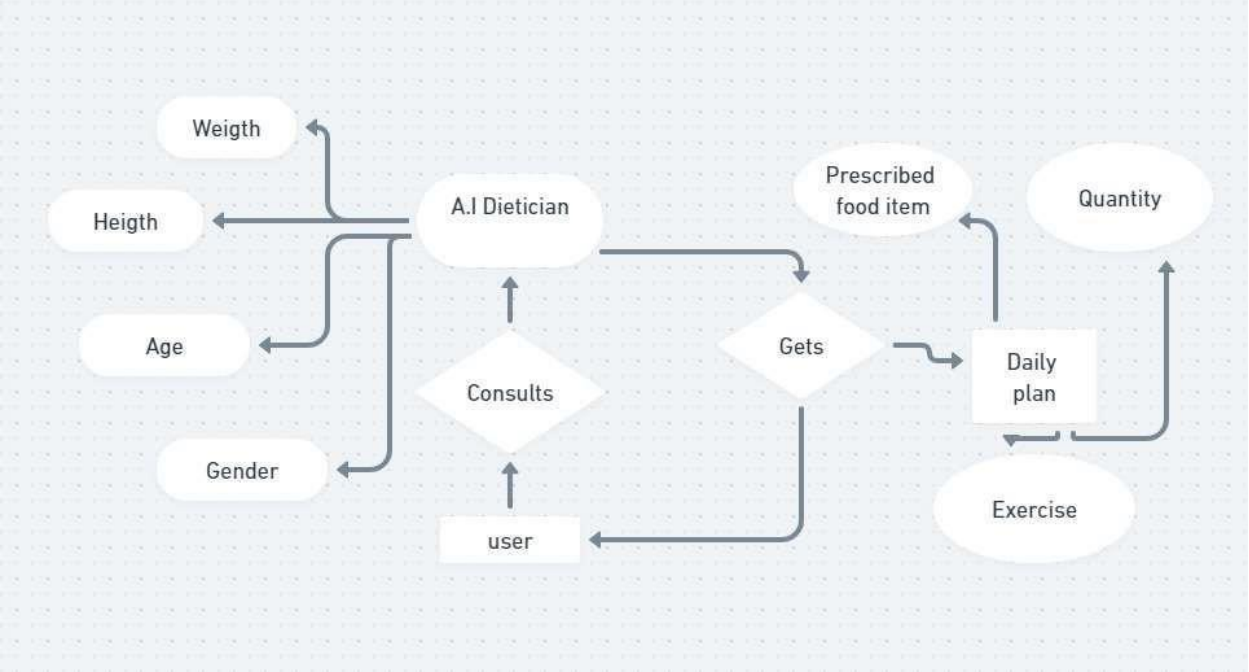


Fig: ER-Diagram of AI DIETICIAN

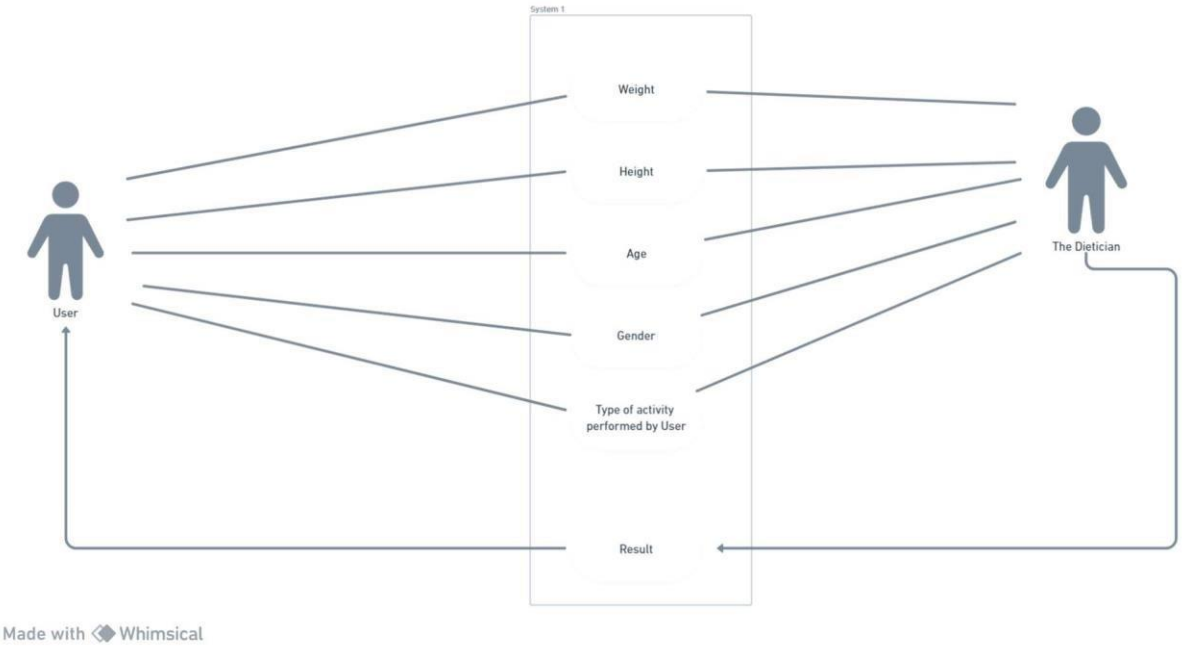


Fig: Use-Case Diagram of AI DIETICIAN

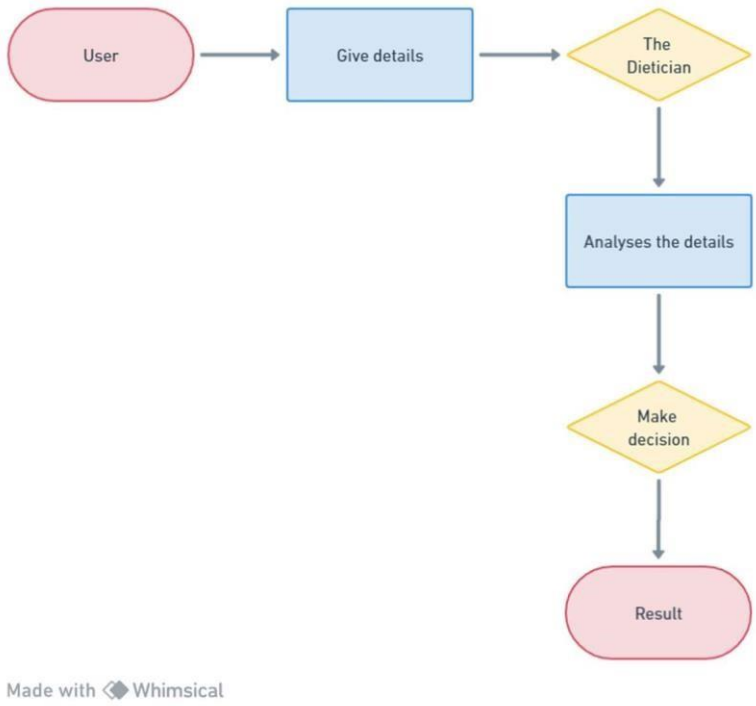


Fig: Flow-chart Diagram of AI Dietician

The suggested system will only accept a question from the user—who may be a man or a woman—and respond to it appropriately. The system will search its knowledge base for the relevant answer to the user's question.

The goal of a "A.I. Dietician" project is to develop a retrieval-based application that uses AI principles to interact with users. When a user enters information about themselves, including age, height, weight, gender, and activity level, the application analyses the request at the beginning, creates a response, and delivers it back to the user. The user's input is broken down by the programme into two main parts: intent and entity. A retrieval-based application in this situation depends on predetermined input patterns and the replies that go along with them. To deliver the most pertinent answer depending on the inquiry, it uses a heuristic technique.

With this approach, consumers may inquire about connected activities without needing to see the dietician in person. The system analyses the user's inquiries using intelligence to produce replies that seem and feel like human-to-human talks. To create the illusion that a live person is interacting with the user, it uses an easy-to-use graphical user interface. This graphical user interface (GUI) programme facilitates user inquiry on diet-related activities and provides users with pertinent dietrelated information.

Tools and Technology Used

Python: Python is a versatile and widely-used programming language, often chosen for building chatbots and other AI-related applications because of its extensive libraries and frameworks for natural language processing and machine learning.

Artificial Intelligence (AI): AI refers to the simulation of human intelligence processes by machines, including tasks like learning, reasoning, problem-solving, and understanding natural language. Chatbots often employ AI techniques to understand and respond to user queries effectively.

Response and Query: These terms are fundamental in chatbot development. A "query" represents a user's question or request, and the chatbot's "response" is the answer or action it provides in return.

Tkinter: A common Python package for building graphical user interfaces (GUIs) is called Tkinter. It offers a collection of tools for making buttons, text fields, windows, dialogue boxes, and other GUI components.

Area of Domain:

Health Care: Artificial intelligence (AI) in healthcare is a fast-growing and exciting topic, especially for dieticians and nutritionists. With its cutting-edge tools and insights for patient care, personalised nutrition, and health management, artificial intelligence (AI) has the potential to revolutionise the dietetics profession in a number of ways.

Literature Review

In [1], Romeshwar Sukla suggested a DASH diet guideline scheme. It applies machine learning algorithms and strategies including content-based filtering to hypertension patients according to their age, food preferences, allergies, degree of smoking, alcohol use, blood pressure, and nutritional intake. A diet regimen called Dietary Approaches to Stop Hypertension (DASH) is used to reduce or manage high blood pressure. The DASH diet places a strong emphasis on foods that are high in potassium, magnesium, and calcium and low in sodium, all of which reduce blood pressure. Meals following the DASH diet consist mostly of grains, fish, poultry, nuts, and an abundance of fruits, vegetables, and dairy products. serves small quantities of sweets, fizzy beverages, and red meat.

Using a case-based approach, Gergely Kov¨asnai at [2] talked about creating an expert system for diet recommendations. This method will be used to build an expert system that will be used in a health record management system. Although the method is predicated on ripple down rules (RDR), patient characteristics and rule actions also require a unique representation.Across all professions, case-based learning (CBL) is an established approach that helps students apply their knowledge to real-world situations and raises their awareness levels.

In [3], Wahidah Husain suggested using data mining methods to create a system that would prescribe a customised diet to cancer patients. The system's main goal is to figure out how much food a patient needs each day based on the nutrition values that match their particular health situation. As a result, the system suggests a daily meal plan with a variety of items to try for breakfast, lunch, and supper for every patient.

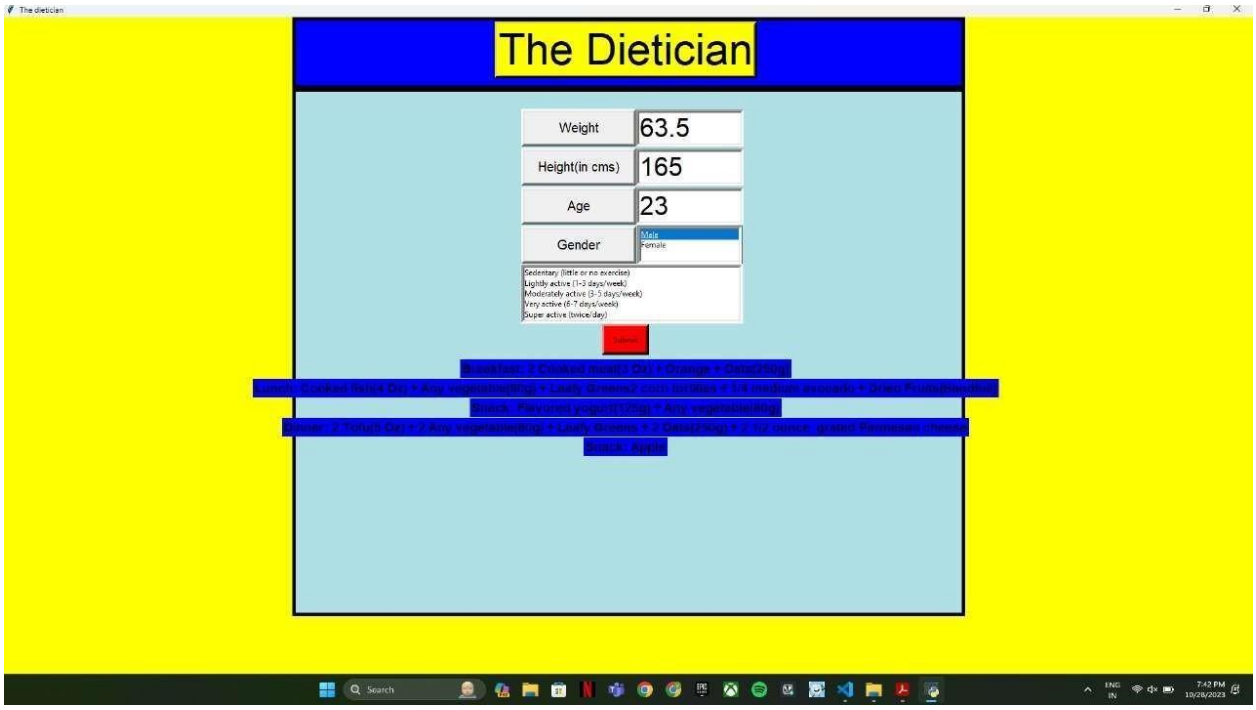
A research paper on automated food planning algorithms for kids was presented by Ashvini Kale in [4]. It is an ID3-based food recommendation system for the Indian food database developed by the dietary management system. For the Indian cuisine database, the suggested method of meal recommendations for kids is based on variables including food preferences, food availability, medical and illness information, personal information, and a child's activity level. This suggestion aids in choosing foods from the database so that the child will have a balanced diet and that deficiencies won't occur very soon.

A data mining technique called case-based reasoning (CBR) is used to solve problems. Rather than depending just on broad knowledge about the problem's origin, CBR makes use of information about particular situations that they have encountered in the past, or "cases," by organising or sharing the link between findings and adjectives[5].

Jen-Hao Hsiao at [6] talked about customer comments on the diet plan. Here the user has the option to change the menu to suit their preferences, after which the Meal Planner recalculates a Pareto optimum solution using the modified restrictions. It is consequently anticipated that the user would receive a more personalised meal plan from this interactive diet planning tool.

Results and output

The outcomes of using artificial intelligence Dietitians have shown promise in a variety of settings and have enormous potential to enhance people's health and wellbeing.
Dieticians using artificial intelligence (AI) provide a range of advantages and results, including cost-effectiveness, continuous monitoring, nutritional awareness, allergy and dietary restriction management, and convenience and accessibility.

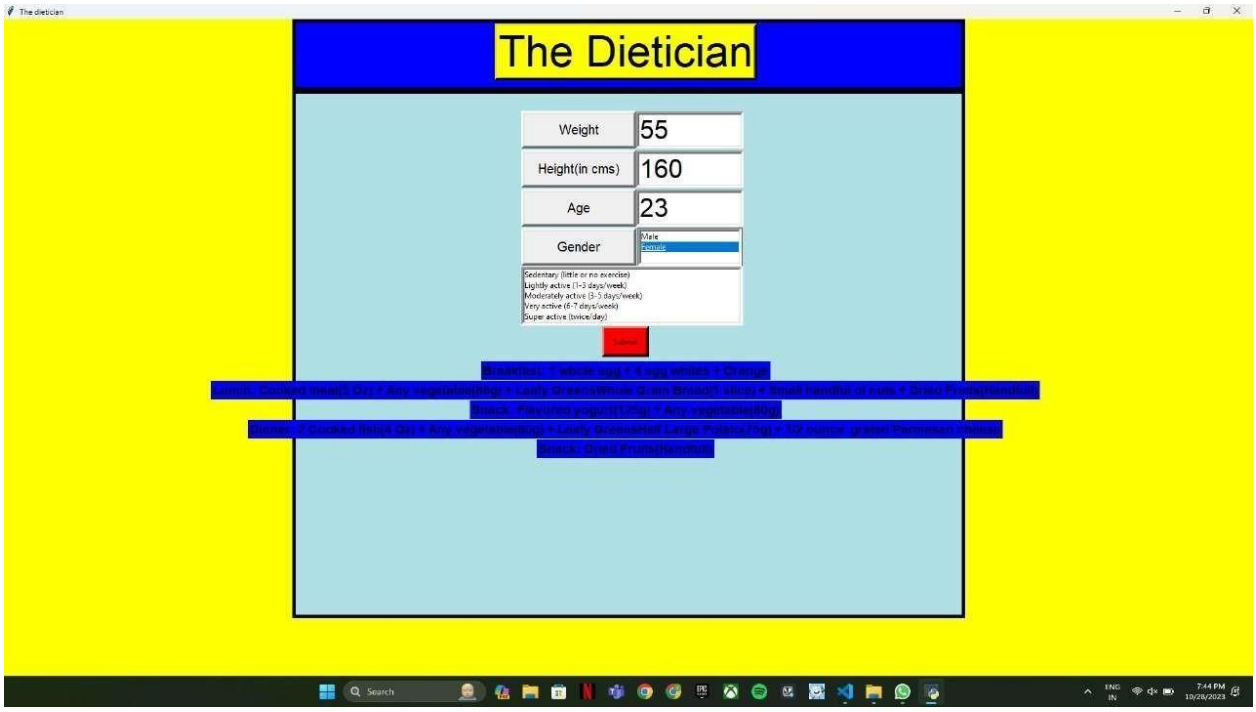


As you can see in the screenshot, we have provided user details in the system to get a healthy diet according to the provided details.

In these we have provided details of a male user,

- Weight: -63.5
- Height: - 165
- Age: - 23
- Gender: - male
- and other activities

After providing some more details it processed a proper nutrition filled diet for the male user.



In the second time we provided different details in the system. In this we provided details of a female user:

- Weight: -55
- Height: - 160
- Age: - 23
- Gender: - female
- and other activities

As you can see the system provided a nutritional diet after providing details of a female user.

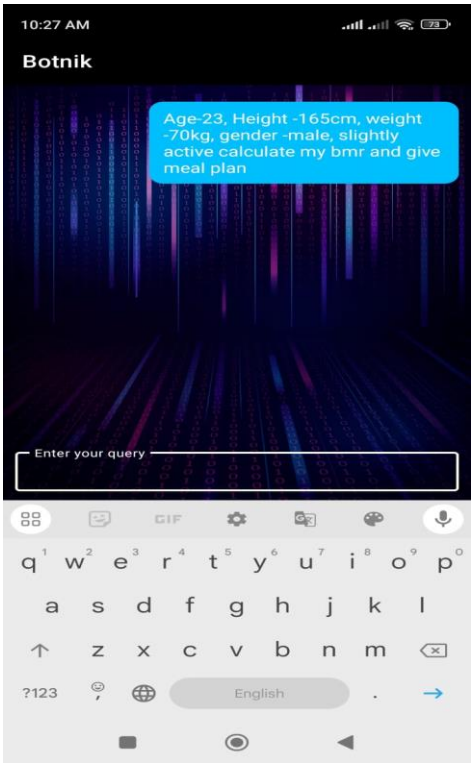
Mobile app and outputs

In a time when many people prioritise their health and well-being, the combination of nutrition and technology presents a promising answer. A Python-based initiative called the AI Dietician Mobile App aims to offer consumers individualised food suggestions and direction on their path to improved health.

The AI Dietician Mobile App's main mission is to give consumers personalised dietary advice based on their individual profiles and health goals. The software uses artificial intelligence (AI) algorithms to analyse user data, including age, height, weight, and food preferences as well as exercise objectives. The result is a personalised nutrition plan that encourages well-being and supports long-term lifestyle improvements.

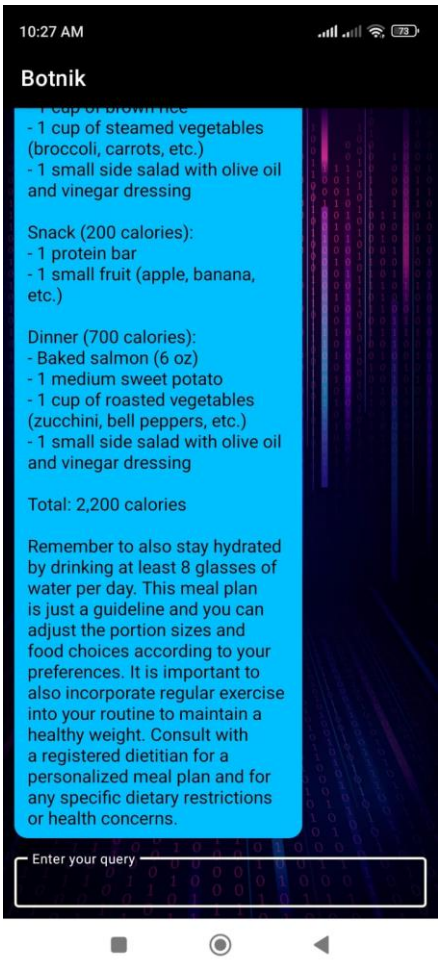
The AI Dietician mobile app uses natural language processing (NLP) technologies to power a chatbot interface. The user experience can be improved by allowing users to converse with the chatbot and get prompt responses to any questions they may have about nutrition.

Outputs



We need to provide our information, as the A.I. Dietician smartphone app (botnik) illustrates. specifics such as:- Age: 20 years; height: 170 cm; weight: 70 kg gender: either female or male

Once the information was analysed, botnik calculated our BMR and gave us with a comprehensive diet.



As you can see from the screenshot above, Botnik gave us a detailed diet plan and calculated our BMR (Calorie intake). Additionally, it will recommend the daily caloric intake for you, which you can subsequently adhere to using the diet Botnik given.

With 500 calories for breakfast, 200 for snacks, 600 for lunch, 200 for snacks, and 700 for dinner, the diet that is offered has a total of 2,200 calories.

In order to stay hydrated, it will also recommend how many litres of water you should drink each day.

In order to provide you with the healthiest diet possible, Botnik will also inquire about your daily routine, sports participation, allergy, sleep patterns, and other details.

The app encourages culinary innovation and diversity by offering users a carefully chosen assortment of wholesome recipes that are in line with their dietary needs and preferences.

each user can construct a unique profile, the app can adjust ideas and recommendations over time in response to the user's changing requirements and preference

Conclusion And Future Scope

In summary, this project report's description of the creation and use of an AI dietician marks a substantial achievement in the fields of nutrition and healthcare. The AI dietitian is a cuttingedge approach to addressing the expanding diet- and nutrition-related global health concerns, such as the demand for individualised dietary recommendations and the rise in chronic disease rates.It is clear from the thorough examination and evaluation of the AI dietitian that this technology has a number of noteworthy advantages. It can offer individualised dietary advice that takes into consideration dietary needs, limits, and preferences. Furthermore, it might make dietary guidelines more widely available to a larger audience by bridging socioeconomic and geographic divides.However, it's important to recognise that although though AI dietitians have a lot of potential, they are not perfect. The human touch and empathy in nutrition counselling are vital, thus technology shouldn't completely replace dietitians. In addition, issues with data privacy and ethical issues need to be taken into account while developing and using AI dietitians.The study report concludes by showing how AI dietitians have the power to completely change how people approach their nutrition and diets. Their capacity to offer individualised, data-driven advice can make a substantial difference in enhancing public health and lowering the prevalence of illnesses linked to nutrition. To realise their full potential and tackle the intricate dietary difficulties of our day, further research and development in AI dietetics will be necessary as the area of AI in healthcare advances.

Future Scope

Strengthening personalization is where AI dieticians will go in the future. More comprehensive datasets, such as genetic data, gut microbiome data, and real-time physiological measures, can be integrated to do this. Based on unique health signals, AI dieticians will be able to deliver ever more accurate food recommendations. AI dieticians will grow to provide ongoing dietary tracking via wearable technology and intelligent home products. With the use of real-time data, these applications will measure food intake, provide substitutes, and dynamically modify meal plans. Users may anticipate prompt assistance and feedback.

AI dieticians will be a part of the larger healthcare industry, interacting with telehealth platforms, EHRs, and healthcare providers with ease. This will make it possible to provide patients with care that is more all-encompassing, especially for those who have long-term illnesses like diabetes, obesity, or heart disease. AI dieticians will instruct customers on how to create nutritious meals through interactive culinary aid. Additionally, they will offer instructional materials to help consumers better understand nutrition and encourage long-term dietary adjustments.

AI dieticians' user interfaces will keep developing, providing increasingly immersive and intuitive experiences. These include augmented reality (AR) apps and voice-activated AI dieticians that help customers choose healthier meals when they're dining out.

SOURCE CODE:

```
from tkinter import *
from random import randint

top = Tk() top.config(bg='yellow')
top.title('The dietician')

def BMR():      protein = ['Yogurt(1 cup)', 'Cooked meat(3 Oz)', 'Cooked fish(4 Oz)', '1 whole egg
+ 4 egg whites', 'Tofu(5 Oz)']        fruit = ['Berries(80 Oz)', 'Apple', 'Orange', 'Banana', 'Dried
Fruits(Handfull)', 'Fruit Juice(125ml)']      vegetable = ['Any vegetable(80g)']     grains = ['Cooked
Grain(150g)', 'Whole Grain Bread(1
slice)', 'Half Large Potato(75g)', 'Oats(250g)',
            '2 corn tortillas']
   ps = ['Soy nuts(i Oz)', 'Low fat milk(250ml)', 'Hummus(4 Tbsp)', 'Cottage cheese (125g)',
'Flavored yogurt(125g)']
   taste_en = ['2 TSP (10 ml) olive oil', '2 TBSP (30g) reduced-calorie salad dressin', '1/4 medium
avocado',
             'Small handful of nuts', '1/2 ounce  grated Parmesan cheese',
'1 TBSP (20g) jam, jelly, honey, syrup, sugar']

   w = v3.get()     h =
v4.get()     age = v5.get()     act
= str(Lb.get(ACTIVE))
   gender = Lb2.get(ACTIVE)

   if gender == 'Male':
      cal = float()          cal = 88.362 + (13.397 * float(w)) + (4.799 * float(h)) -
(5.677 * float(age))          print(cal)     elif gender == 'Female':          cal = float()
cal = 447.593 + (9.247 * float(w)) + (3.098 * float(h)) - (4.330 * float(age))

   if act == 'Sedentary (little or no exercise)':
      cal = cal * 1.2

   elif act == 'Lightly active (1-3 days/week)':
      cal = cal * 1.375

   elif act == 'Moderately active (3-5 days/week)':
      cal = cal * 1.55

   elif act == 'Very active (6-7 days/week)':
      cal = cal * 1.725
```

```
    elif act == 'Super active (twice/day)':
        cal = cal * 1.9

    print(cal)

    if cal < 1500:
        fin = StringVar()        fin = "Breakfast: " + protein[randint(0, 5)] + " " +
" + fruit[randint(0, 5)]        label.config(text=fin)

        fin2 = StringVar()        fin2 = "Lunch: " + protein[randint(0, 5)] + " " + " + vegetable[0] + " +
Leafy Greens" + grains[                randint(0, 4)] + " " + " + taste_en[randint(0, 5)]
label2.config(text=fin2)

        fin3 = StringVar()        fin3 = "Snack: " + ps[randint(0, 4)]
" + " " + " + vegetable[0]        label3.config(text=fin3)

        fin4 = StringVar()        fin4 = ("Dinner: " + protein[randint(0, 5)] + " " + 2 " + vegetable[0] +
" " + Leafy Greens" + grains[                randint(0, 4)] + " " + " + taste_en[randint(0, 5)])
label.config(text=fin4)

        fin5 = StringVar()        fin5 = ("Snack:
" + fruit[randint(0, 5)])
label5.config(text=fin5)

    elif cal < 1800:        fin = IntVar()        fin = ("Breakfast: " +
protein[randint(0, 5)] + " " + " + fruit[randint(0, 5)])        label.config(text=fin)

        fin2 = StringVar()        fin2 = ("Lunch: " + protein[randint(0, 5)] + " " + " + vegetable[0] + " +
Leafy Greens" + grains[                randint(0, 4)] + " " + " + taste_en[randint(0, 5)] + " " + " +
fruit[randint(0, 5)])        label2.config(text=fin2)

        fin3 = StringVar()
        fin3        =        ("Snack:        "        +        ps[randint(0,    4)]        +        "        +
            "        +        vegetable[0])        label3.config(text=fin3)

        fin4 = StringVar()        fin4 = ("Dinner: 2 " + protein[randint(0, 5)] + " " + " + vegetable[0] +
" + Leafy Greens" + grains[                randint(0, 4)] + " " + " + taste_en[randint(0, 5)])
label4.config(text=fin4)

        fin5 = StringVar()        fin5 = ("Snack:
" + fruit[randint(0, 5)])
label5.config(text=fin5)

    elif cal < 2200:
```

```
        fin = StringVar()        fin = ("Breakfast: " + protein[randint(0, 5)] + " + "
+ fruit[randint(0, 5)])        label.config(text=fin)

        fin2 = StringVar()        fin2 = ("Lunch: " + protein[randint(0, 5)] + " + " + vegetable[0] + " +
Leafy Greens" + grains[                randint(0, 4)] + " + " + taste_en[randint(0, 5)] + " + " +
fruit[randint(0, 5)])        label2.config(text=fin2)

        fin3 = StringVar()        fin3 = ("Snack: " + ps[randint(0, 4)]
+ " + " + vegetable[0])        label3.config(text=fin3)

        fin4 = StringVar()        fin4 = ("Dinner: 2 " + protein[randint(0, 5)] + " + 2 " + vegetable[0]
+ " + Leafy Greens" + grains[                randint(0, 4)] + " + " + taste_en[randint(0, 5)])
label4.config(text=fin4)

        fin5 = StringVar()        fin5 = ("Snack:
" + fruit[randint(0, 5)])
label5.config(text=fin5)

    elif cal >= 2200:        fin = StringVar()        fin = ("Breakfast: 2 " + protein[randint(0, 5)] + " +
" + fruit[randint(0, 5)] + " + " + grains[randint(0, 4)])
label.config(text=fin)

        fin2 = StringVar()        fin2 = ("Lunch: " + protein[randint(0, 5)] + " + " + vegetable[0] + "
+ Leafy Greens" + grains[            randint(0, 4)] + " + " + taste_en[randint(0, 5)] + " + " +
fruit[randint(0, 5)])        label2.config(text=fin2)

        fin3 = StringVar()        fin3 = ("Snack: " + ps[randint(0, 4)]
+ " + " + vegetable[0])        label3.config(text=fin3)

        fin4 = StringVar()        fin4 = ("Dinner: 2 " + protein[randint(0, 5)] + " + 2 " + vegetable[0]
+ " + Leafy Greens + 2
" + grains[
            randint(0,        4)]        +        "        +        2        "        +        taste_en[randint(0,
            5)])        label4.config(text=fin4)

        fin5 = StringVar()        fin5 = ("Snack:
" + fruit[randint(0, 5)])
label5.config(text=fin5)

C        =        Canvas(top,        bg="blue",        height=100,        width=1024,        highlightthickness=5,
highlightbackground="black")
C.pack()

C2 = Canvas(top, bg="powder blue", height=800, width=1024, highlightthickness=5,
highlightbackground="black")  C2.pack()
```

```
l = Label(top, text='The Dietician', bg='yellow', relief='raised', borderwidth=5) l.config(font=('helvetica', 50))
C.create_window(512, 50, window=l)

v3 = StringVar() v4
= StringVar() v5 = StringVar()

Lb2 = Listbox(top, bd=5, width=25, height=3)
Lb2.insert(1, 'Male')
Lb2.insert(2, 'Female')
C2.create_window(611, 240, window=Lb2)

Lb = Listbox(top, bd=5, height=5, width=55)
Lb.insert(1, 'Sedentary (little or no exercise)')  Lb.insert(2,
'Lightly active (1-3 days/week)')
Lb.insert(3, 'Moderately active (3-5 days/week)')
Lb.insert(4, 'Very active (6-7 days/week)')
Lb.insert(5, 'Super active (twice/day)')
C2.create_window(522, 315, window=Lb) var
= Lb.get(ACTIVE) print(var)

l2 = Label(top, text="Weight", height=2, width=15, borderwidth=5, relief="raised") l2.config(font=('italic', 15))
C2.create_window(440, 60, window=l2)

e3 = Entry(top, text="number", textvariable=v3, bd=5, width=7, font=('helvetica', 30))
C2.create_window(611, 60, window=e3)

l4 = Label(top, text="Height(in cms)", height=2, width=15, borderwidth=5, relief="raised")
l4.config(font=('italic', 15))
C2.create_window(440, 120, window=l4)

e4 = Entry(top, text="number", textvariable=v4, bd=5, width=7, font=('helvetica', 30))
C2.create_window(611, 120, window=e4)

l5 = Label(top, text="Age", height=2, width=15, borderwidth=5, relief="raised") l5.config(font=('italic', 15))
C2.create_window(440, 180, window=l5)

e5 = Entry(top, text="number", textvariable=v5, bd=5, width=7, font=('helvetica', 30))
C2.create_window(611, 180, window=e5)
```

```
l6 = Label(top, text="Gender", height=2, width=15, borderwidth=5, relief="raised") l6.config(font=('italic', 15))
C2.create_window(440, 240, window=l6)

label = Label(top, bg="blue")
label.config(font=('Italic 14 bold'))
C2.create_window(512, 430, window=label)

label2 = Label(top, bg="blue")  label2.config(font=('Italic
14 bold'))
C2.create_window(512, 460, window=label2)

label3 = Label(top, bg="blue")
label3.config(font=('Italic 14 bold'))
C2.create_window(512, 490, window=label3)

label4 = Label(top, bg="blue")
label4.config(font=('Italic 14 bold'))
C2.create_window(512, 520, window=label4)

label5 = Label(top, bg="blue")
label5.config(font=('Italic 14 bold'))
C2.create_window(512, 550, window=label5)

button = Button(top, text=" Submit ", bd=5, bg="red", fg="black", height=2, width=8,
command=BMR)
C2.create_window(512, 385, window=button)

top.mainloop()
```

REFERENCE

[1] "A DASH Diet Recommendation System for Hypertensive Patients Using Machine Learning," Romeshwar Sookrah, Jaysree Devee Dhowtal, and Soulakshmee Devi Nagowah, 2019 7th International Conference on Information and Communication Technology.

[2] In the 2011 IEEE 6th International Symposium on Applied Computational Intelligence and Informatics, Gergely Kov¨asznai presented his work "Developing an expert system for diet recommendation."

[3] "Application of data mining techniques in a personalised diet recommendation system for cancer patients," Wahidah Husain, Lee Jing Wei, Sooi Li Cheng, and Nasriah Zakari, 2011 IEEE Colloquium for Humanities, Science, and Engineering.

[4] Ashivini Kale and Nisha Auti, "Food Recommendation by Dietary Management System using ID3 for Indian Food Database: Automated Menu Planning Algorithm for Children," Procedia Computer Science, Volume 50, 2015, pp. 197-202.

[5] AICom–Artificial Intelligence Communication, IOS Press, Vol. 7, No. 1, pp. 39–59, 1994. Aamodt, E. Plaza, "Case-based Reasoning, Foundation Issues,Methodological Variations and System Approaches."

[6] At the IEEE 23rd International Symposium on Computer-Based Medical Systems (CBMS), October 2010, Jen-Hao Hsiao1 and Henry Chang2 present "SmartDiet: A Personal Diet Consultant for Healthy Meal Planning."

[7] We utilised a picture from Rawpixel.com's Freepik for the app's backdrop.

[8] We utilised an image from vectorjuice's Freepik collection for the app icon.