PROJECT REPORT

NUTRITION ASSISTANT APPLICATION

TEAM ID : PNT2022TMID43070

TEAM LEADER : RAJA V

TEAM MEMBER : SIRANJEEVI S

TEAM MEMBER : DHINAKARAN S

TEAM MEMBER : RAHUL R

COLLEGE NAME : SREE SAKTHI ENGINEERING COLLEGE

DEPARTMENT : COMPUTER SCIENCE & ENGINEERING

FACULTY MENTOR NAME : VINOTHINI S

INDUSTRY MENTOR NAME : SAI PRIYA

EVALUATOR NAME : SWETHA S

TABLE CONTENT

1. INTRODUCTION:

1.1. PROJECT OVERVIEW:

This project is aimed at developing a desktop-based application named Nutrition Assistant Application for estimating food attributes such as ingredients and nutritional value by classifying the input images of food. The Nutrition Assistant Application refers to the system and processes to help the user to analyze the intake of food with the involvement of a Technology system. This system can be used to store the details of the user's health, calculating the BMI, Classifying the food image to know the nutritional value, update the status of their health condition based on the information provided, and generate health reports weekly or monthly based. This project is categorizing the individual health condition of the user. The Nutrition Assistant Application is important to control their daily calorie intake by eating healthier foods, which is the most basic method to avoid obesity. Without proper diet control, this is reflective of the risks to people's health. A good Nutrition Assistant Application will alert the users when it is time to avoid. This

project aims at building a web App that automatically estimates food attributes such as ingredients and nutritional value by classifying the input image of food.

Nutrition is the process of consuming, absorbing, and using nutrients needed by the body for growth, development, and maintenance of life.To receive adequate, appropriate nutrition, people need to consume a healthy diet, which consists of a variety of nutrients-the substances in foods that nourish the body. A healthy diet enables people to maintain a desirable body weight and composition (the percentage of fat and muscle in the body), to do their daily physical and mental activities, and to minimize risk of disease and disability.

1.2. PURPOSE:

The users continue to demand to know the nutritional value that is in their food. The users learn about the effect of different foods on human health. Evidently, the ultimate aim of this application is to provide the ways in which one can lead a healthy life by maintaining his/her diet. The user can access the nutritional information by taking a photo of the food, uploading a photo from the gallery, or by entering manually.

Nutrition is more than just obtaining nutrients and calories from food. It’s more than just eating the healthy stuff. It’s more than just following the most recent fad diet. Nutrition, the food we eat and the way we eat it, is an integral part of life. Nutrition is an experience. It evokes memories, helps us celebrate good times, and is there for us in times of grief. I believe the purpose of nutrition is to nourish the body and soul.The Nutrition Assistant Application helps the users to eat nutritional rich food which yields to lead a healthy life.

2. LITERATURE SURVEY:

2.1. EXISTING PROBLEM:

Existing national and international dietary guidelines constitute important informational sources for nutrition (Painter et al. 2002) but are often based on guidelines for a whole population instead of dealing with individual requirements. Yet, efforts towards personalized nutrition recommendations have been made by Zeevi et al. (2015) and within the Food4Me study (Celis-Morales et al. 2015). Zeevi et al. (2015) incorporated different individual aspects into their algorithm based on machine-learning techniques like dietary behavior, anthropometrics, blood biomarkers and the gut microbiome. Based on this, they could successfully predict the post-prandial glucose response (PPGR) that varies greatly between different individuals for the same meal. Celis-Morales et al. (2015) examined in their 6-month study the effectiveness of personalized nutrition advice, which was based on dietary, phenotypic and genotypic information. Their results showed higher effectiveness in changing nutrition habits through personalized dietary advice than conventional dietary advice.

2.2. REFERENCES:

1. Aune, D., Giovannucci, E., Boffetta, P., Fadnes, L.T., Keum, N., Norat, T., Greenwood, D.C., Riboli, E., Vatten, L.J., Tonstad, S.: Fruit and vegetable intake and the risk of cardiovascular disease, total cancer and all-cause mortality–a systematic review and dose-response meta-analysis of prospective studies. Int. J. Epidemiol. 46(3), 1029–1056 (2017)
2. Celis-Morales, C., Livingstone, K., Marsaux, C., et al.: Effect of personalized nutrition on health-related behavior change: evidence from the food4me european randomized controlled trial. Int. J. Epidemiol. 46(2), 578–588 (2016)
3. Davis, C., Bryan, J., Hodgson, J., Murphy, K.: Definition of the

mediterranean diet; a literature review. Nutrients 7(11), 9139–9153 (2015)
4. Harris, W.S., Mozaffarian, D., Lefevre, M., Toner, C.D., Colombo, J., Cunnane, S.C., Holden, J.M., Klurfeld, D.M., Morris, M.C., Whelan, J.: Towards establishing dietary reference intakes for eicosapentaenoic and docosahexaenoic acids. J. Nutr. 139(4), 804S-819S (2009)
5. Horton, R. and S. Lo (2013) 'Nutrition: A Quintessential Sustainable Development Goal', TheLancet 382(9890): 371-72.
6. Lin, H.P., Baghdasarian, S., Singer, M.R., Mott, M.M., Bradlee, M.L., Pickering, R.T., Moore, L.L.: Dietary cholesterol, lipid levels, and cardiovascular risk among adults with diabetes or impaired fasting glucose in the framingham offspring study. Nutrients 10(6), 770 (2018)
7. Rabbi, M., Aung, M.H., Zhang, M., Choudhury, T.: MyBehavior: automatic personalized health feedback from user behaviors and preferences using smartphones. In: Ubicomp '15, September 7–11, 2015, Osaka, Japan pp 707–718 (2015).
8. Scrimshaw NS, Taylor CE, Gordon JE. Interactions of nutrition and infection. Geneva: WHO; 1968.
9. Wolk, A.: Potential health hazards of eating red meat. J. Intern. Med. 281(2), 106–122 (2017)

2.3. PROBLEM STATEMENT DEFINITION:

PROBLEM

People are suffering with obesity and many other various ailments such as diabetes, thyroid etc .which may be due to deficiency in nutrients.

REASONS FOR PROBLEM

Nowadays junk food has become an inevitable part of people's lives. Even

though it doesn't cause much effects with minimal intake, an excessive consumption of the same might lead to various health disorders. Exercise would help to keep these ill effects at bay, but the work culture these days has limited such habits too.

ISSUES

A lot of people suffer from diabetes, thyroid, etc. These people may have a chance of living their life without being sick by following a healthy food regime.There are over thousands of people, mainly kids, suffering due to obesity these days. In today's world exercise has become so sporadic and not everyone is keen nor have the time to pursue the same. So the only way for them to stay healthy is by having a healthy diet. When all men and women are hale, hearty and healthy our society would achieve great heights and success. An ecosystem filled with sick and unhealthy people is bound to have a downfall. So it is very much important to ensure the wellness of our species.

IMPORTANCE OF FIXING THE PROBLEM

A hale, hearty and healthy society is never meant to face a downfall. So it is crucial to make sure all human beings are in good shape. On using our app, the customer would be facilitated to have a note of their calorie consumption and hence, do not go overboard with the junk. When a lot of people get to know about the true intentions of the app, they recommend the same to their peers and family, thus, resulting in an expansion of the customer base.

TECHNOLOGY IN NUTRITION ASSESSMENT

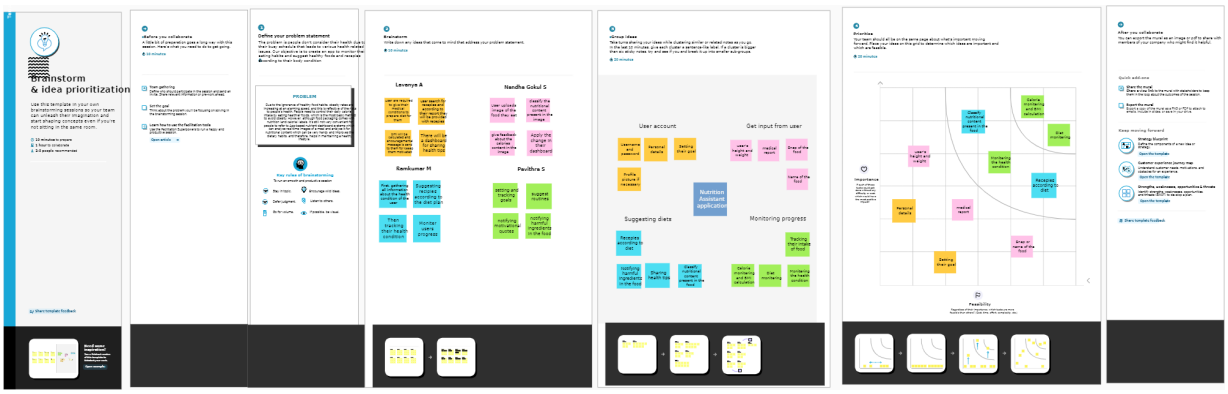
In today's life, people have started emphasizing a healthier lifestyle due to self-awareness rather than societal stereotypes. Majority of people want to start eating foods with more nutritional value but are stuck in a pit of "where to start". The solution to this problem is to build a nutrition analysis system using Artificial

Intelligence and Machine Learning that aims at providing nutritional data of any food item with a decent accuracy.Fitness apps are blooming in today's technology market. Along with workout recommendations, these apps also help users to connect to nutritionists all around the world who work on suggesting a proper diet schedule for the users. The hurdle these nutritionists face is that there are a huge number of food items and it is impossible for one to know the details of all such food items. Artificial Intelligence and Machine Learning that could assess food items and provide the amount of nutrients it contains

3. IDEATION AND PROPOSED SOLUTION:

3.1. EMPATHY MAP CANVAS:

3.2. IDEATION AND BRAINSTORMING:



3.3. PROPOSED SOLUTION:

S.NO	Parameter	Description
1.	Problem Statement (Problem to be solved)	Nowadays people are not eating healthy foods with respect to their health. If it happens continuously, it will lead to obesity and any other health problems. To avoid that the system will detect and recognize the food and evaluate the nutrient values present in the food.
2.	Idea / Solution description	To store the food and details of the nutrients present in it.Then scan the real time food and retrieve the corresponding food's nutrient values.
3.	Novelty / Uniqueness	Clustering the people based on their BMI value.
4.	Social Impact / Customer Satisfaction	The application which gives awareness among the people about obesity and various health problems.
5.	Business Model (Revenue Model)	In the market, this application gives benefits to the people health wise and economical wise.
6.	Scalability of the Solution	The application which creates an impact among the healthy lifestyle.

3.4. PROBLEM SOLUTION FIT:

4. REQUIREMENT ANALYSIS:

4.1. FUNCTIONAL REQUIREMENTS:

S.NO	IDENTIFIER	REQUIREMENTS
1.	Add health information	This application will allow users to add health related information.
2.	Delete health information	This application will allow them to delete the unwanted details about their health.
3.	Categories of nutritional food	The categories of food.
4.	View of Dashboard	Application will allow the user to view the dashboard containing nutrition details.

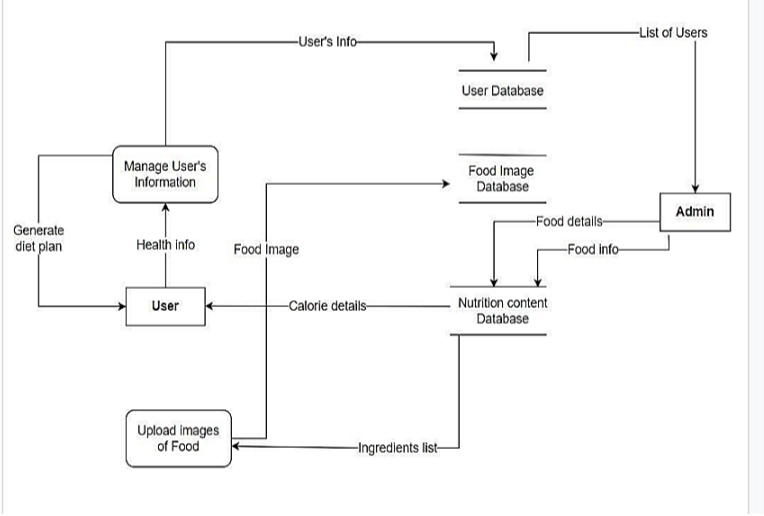
5.	Mail Notification	This application will allow to send mail notification to user when there are any issues regarding their health
6.	Tracking System	The health can be tracked with this application.
7.	Graph analysis	This application will demonstrate health condition by means of nutritional content
8.	Identifying the high calorie food	The high calorie ingredients will be shown via this application.
9.	Identifying the low calorie food	The low calorie ingredients will be shown via this application
10.	Passcode	This application has the option to set a passcode to keep their medical reports safe.
11.	Add multiple accounts	This application has the option of creating multiple accounts for the users.
12.	Selection of health report duration	This application has the ability to select the duration for displaying the health report as weekly or monthly.
13.	Update account	This application will allow the user to update their profile.
14.	Add account	This application will allow the user to add their profile.
15.	Delete account	This application will allow the user to delete their profile.
16.	PDF report	This application will generate the pdf report of medical analysis.
17.	Pupation of nutritional trends	This application will allow constant review of nutritional trends and pupation.

4.2. NON-FUNCTIONAL REQUIREMENTS:

S.NO	IDENTIFIER	REQUIREMENTS
1.	Availability	Requirements for app continuous running, for example, 24/7, minimum idle time, etc.
2.	Reliability	App behavior in case of alarm status, for example, automatic restart and operation recovery.
3.	Scalability	Ways to expand the system and avoid adversely affected performance.
4.	Performance	How many simultaneous users or transactions the system is to service and its response time.
5.	Security	App operation and use of safety requirements related to access control, private data processing, and external attack risk reduction.
6.	Usability	Ease of use and user-friendly interface, that allow users to seamlessly interact with the product.
7.	Extensibility	Requirements for app extensibility in case there is a need to add new functional requirements.

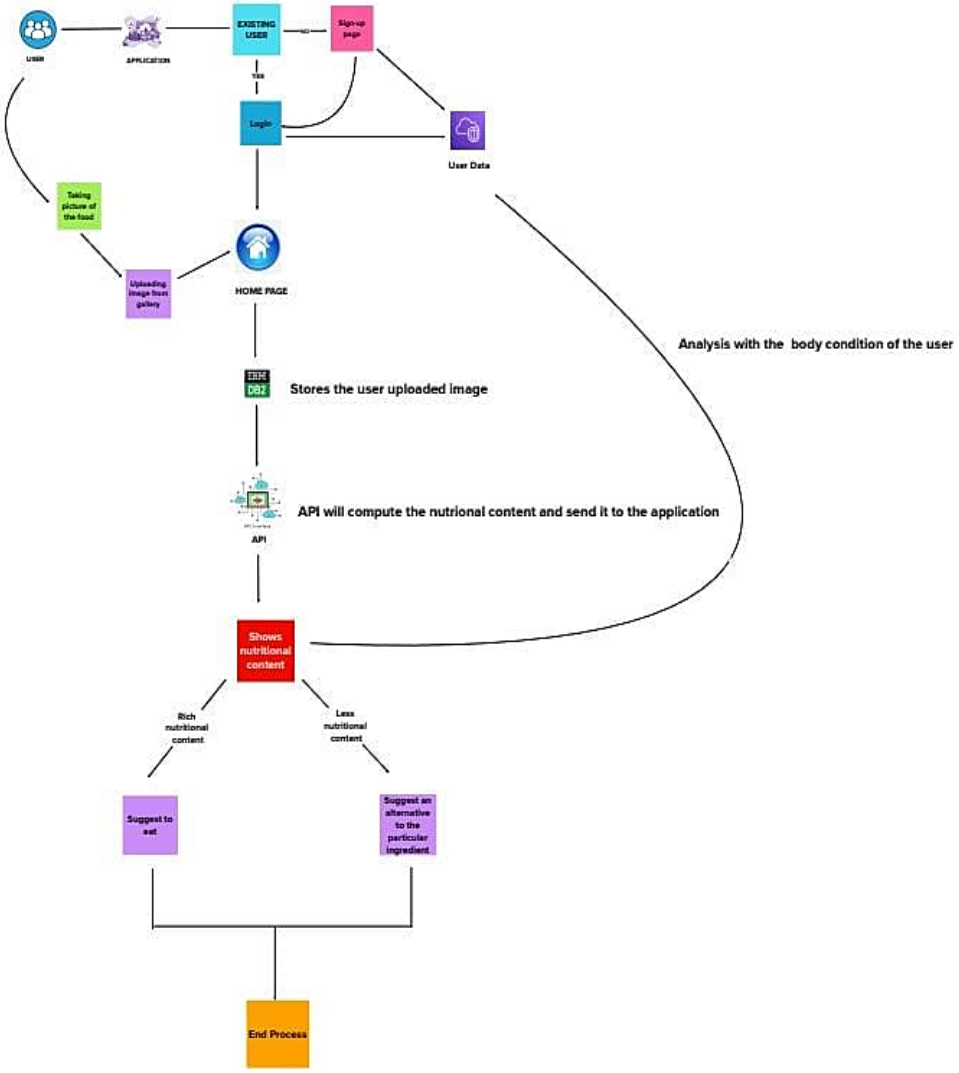
5. PROJECT DESIGN:

5.1. DATA FLOW DIAGRAMS:

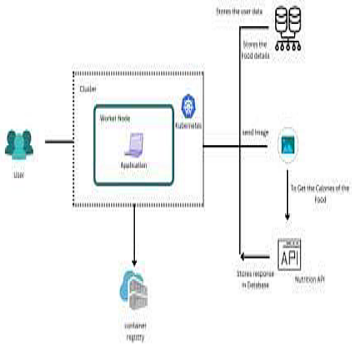


5.2. SOLUTION AND TECHNICAL ARCHITECTURE:

SOLUTION ARCHITECTURE



TECHNICAL ARCHITECTURE



5.3. USER STORIES:

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (Web user)	Registration	USN-1	As a user, I can register for the application by entering my email, password, and confirming my password.	I can access my account / dashboard	High	Sprint - 1
		USN-2	As a user, I will receive confirmation email once I have registered for the application	I can receive confirmation email & click confirm	High	Sprint - 1
		USN-3	As a user, I can register for the application through social media	I can register & access the dashboard with Social Media Login	Low	Sprint - 2
		USN-4	As a user, I can register for the application through Gmail	I can register & access the dashboard with Gmail	Medium	Sprint - 1
	Login	USN-5	As a user, I can log into the application by entering email & password	I can access the application	High	Sprint - 1

	Dashboard	USN-6	As a user, I can navigate the different features of the application		High	Sprint - 1
	Home Page	USN-7			High	
	Upload the food image	USN-8	As a user, I am able to upload food images in Prediction of the food image.	Clarity of the picture	High	Sprint - 3
		USN-9	As a user, I am able to get the details of the food that is uploaded to the application to get to know the nutritional content.	I can view the nutritional details.	High	Sprint - 3
	View the history of food items searched.	USN-10	As a user, I can able to view the search history	I can view my history of search	Medium	Sprint - 4
Customer Care Executive		USN- 11	As a customer care executive I can able to solve the issues faced by the customer	I can provide solution/support at any time	Medium	Sprint - 3
Administrat or	Application	USN-12	As a Administrator I can able to update the application whenever in need	I can fix the bug which is arises by the customer who use the application	Medium	Sprint - 3

6. PROJECT PLANNING AND SCHEDULING:

6.1. SPRINT PLANNING AND ESTIMATION:

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Registration	USN-1	As a user, I can register for the application by entering my email , password, and confirming my password.	2	High	Raja V Siranjeevi S Dhinakaran S Rahul R
Sprint-1		USN-2	As a user,I will receive confirmation Email once I have registered for the application	1	High	Raja V Siranjeevi S Dhinakaran S Rahul R
Sprint-1	Login	USN-3	As a user,I can log into the application by entering Email and password	1	High	Raja V Siranjeevi S Dhinakaran S Rahul R
Sprint-2	User Details	USN-4	As a user,I can fill the details	2	High	Raja V Siranjeevi S Dhinakaran S Rahul R
Sprint-3	Push Notification	USN-5	As a user,I will search the food items	2	Medium	Raja V Siranjeevi S Dhinakaran S Rahul R
Sprint-4	Shown The Nutrition Details And Recipe For Scanned Food	USN-6	As a user,I can scan the food and get the nutrition details and recipe for related scanned food	1	High	Raja V Siranjeevi S

6.2. SPRINT DELIVERY SCHEDULE:

Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on Planned End Date)	Sprint Release Date (Actual)
Sprint-1	20	6 Days	24 Oct 2022	29 Oct 2022	20	29 Oct 2022
Sprint-2	20	6 Days	31 Oct 2022	31 Oct 2022	20	31 Oct 2022
Sprint-3	20	6 Days	07 Nov 2022	12 Nov 2022	20	12 Nov 2022
Sprint-4	20	6 Days	14 Nov 2022	19 Nov 2022	20	19 Nov 2022

6.3. REPORT FROM JIRA:

VELOCITY

Imagine we have a 10-day sprint duration, and the velocity of the team is 20 (points per sprint). Let's calculate the team's average velocity (AV) per iteration unit (story points per day)

Average Velocity = Story Points per Day

Sprint Duration = Number of (Duration) days per Sprint

Velocity = Points per Sprint

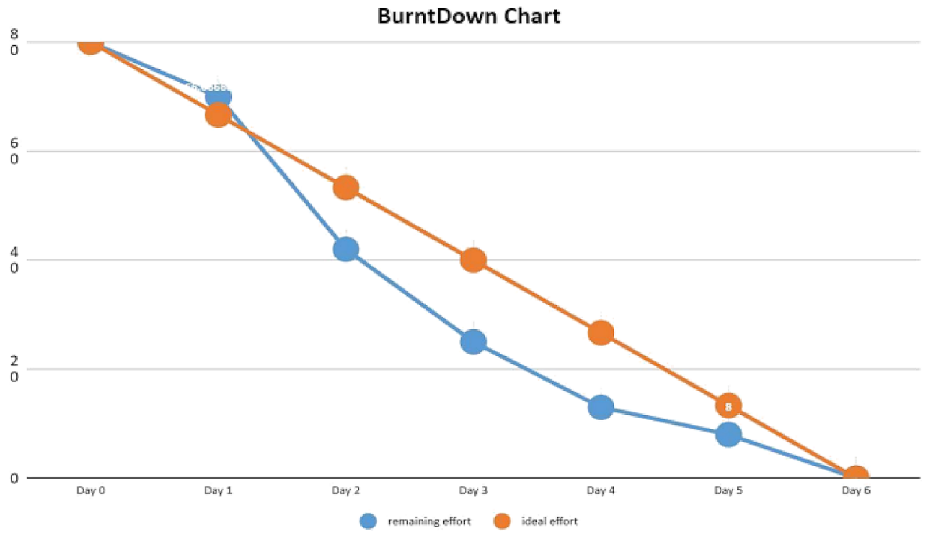
$$AV = \frac{sprint\ duration}{velocity} = \frac{20}{10} = 2$$

AV = 20/6 ~ 4

Therefore, the AVERAGE VELOCITY IS 4 POINTS PER SPRINT

BURNDOWN CHART:

A burndown chart is a graphical representation of work left to do versus time. It is often used in agile software development methodologies such as Scrum. However, burn down charts can be applied to any project containing measurable progress over time.



	Initial estimate		24-Oct 2022		27-Oct 2022		
Sprint number	**Day 0**	**Day 1**	**Day 2**	**Day 3**	**Day 4**	**Day 5**	**Day 6**
Sprint-1	20	0	10	5	3	1	1
Sprint-2	20	2	10	4	1	1	2
Sprint-3	20	5	5	5	5	0	0
Sprint-4	20	3	3	3	3	3	5

Remaining Effort	80	70	42	25	13	8	0
Ideal Effort	80	65	40	21	10	5	0

7. CODING AND SCHEDULING:

7.1. FEATURE 1 (FRONT END):

HTML

HTML (HyperText Markup Language) is the most basic building block of the Web. It defines the meaning and structure of web content. Other technologies besides HTML are generally used to describe a web page's appearance/presentation (CSS) or functionality/behavior (JavaScript). "Hypertext" refers to links that connect web pages to one another, either within a single website or between websites. Links are a fundamental aspect of the Web. By uploading content to the Internet and linking it to pages created by other people, you become an active participant in the World Wide Web.

HTML uses "markup" to annotate text, images, and other content for display in a Web browser. HTML markup includes special "elements" such as <head>, <title>, <body>, <header>, <footer>, <article>, <section>, <p>, , , <img>, <aside>, <audio>, <canvas>, <datalist>, <details>, <embed>, <nav>, <output>, <progress>, <video>, <ul>, <ol>, <li> and many others. An HTML element is set off from other text in a document by "tags", which consist of the element name surrounded by "<" and ">". The name of an element inside a tag is case insensitive. That is, it can be written in uppercase, lowercase, or a mixture. For example, the <title> tag can be written as <Title>, <TITLE>, or in any other way. However, the convention and recommended practice is to write tags in lowercase.

CSS

Cascading Style Sheets (CSS) is a stylesheet language used to describe the presentation of a document written in HTML or XML (including XML dialects such as SVG, MathML or XHTML). CSS describes how elements should be rendered on screen, on paper, in speech, or on other media. CSS is among the core languages of the open web and is standardized across Web browsers according to W3C specifications. Previously, the development of various parts of CSS specification was done synchronously, which allowed the versioning of the latest recommendations. You might have heard about CSS1, CSS2.1, or even CSS3. There will never be a CSS3 or a CSS4; rather, everything is now CSS without a version number.

BOOTSTRAP

Bootstrap is the most popular HTML, CSS and JavaScript framework for developing a responsive and mobile friendly website.It is absolutely free to download and use.It is a front-end framework used for easier and faster web development.It includes HTML and CSS based design templates for typography, forms, buttons, tables, navigation, modals, image carousels and many others.It can also use JavaScript plug-ins.It facilitates you to create responsive designs.

Bootstrap was developed by Mark Otto and Jacob Thornton at Twitter.It was released as an open source product in August 2011 on GitHub.In June 2014 Bootstrap was the No.1 project on GitHub.It is very easy to use. Anybody having basic knowledge of HTML and CSS can use Bootstrap. It facilitates users to develop a responsive website. It is compatible on most browsers like Chrome, Firefox, Internet Explorer, Safari and Opera etc.

7.2. FEATURE 2 (BACK END):

PYTHON (FLASK)

Flask is a web application framework written in Python. It was developed by Armin Ronacher in 2004, who led a team of international Python enthusiasts called Poocco.According to Ronacher, the idea was originally an April Fool's joke that was popular enough to make into a serious application. The name is a play on the earlier Bottle framework.When Ronacher and Georg Brandl created a bulletin board system written in Python in 2004, the Pocoo projects Werkzeug and Jinja were developed.In April 2016, the Pocoo team was disbanded and development of Flask and related libraries passed to the newly formed Pallets project. Since 2018, Flask-related data and objects can be rendered with Bootstrap.Flask has become popular among Python enthusiasts. As of October 2020, it has second most stars on GitHub among Python web-development frameworks, only slightly behind Django,and was voted the most popular web framework in the Python Developers Survey 2018, 2019, 2020 and 2021.

Flask is based on the Werkzeug WSGI toolkit and the Jinja2 template engine.Both are Pocco projects.To install flask on the system, we need to have python 2.7 or higher installed on our system. However, we suggest using python 3 for the development in the flask.

WSGI : It is an acronym for web server gateway interface which is a standard for python web application development. It is considered as the specification for the universal interface between the web server and web application.

Jinja2 : Jinja2 is a web template engine which combines a template with a certain data source to render the dynamic web pages.

7.3. DATABASE SCHEMA:

SQL

SQL (Structured Query Language) is used to perform operations on the records stored in the database, such as updating records, inserting records, deleting records,

creating and modifying database tables, views, etc.SQL is not a database system, but it is a query language.Suppose you want to perform the queries of SQL language on the stored data in the database. You are required to install any database management system in your systems, for example, Oracle, MySQL, MongoDB, PostgreSQL, SQL Server, DB2, etc.SQL is a short-form of the structured query language, and it is pronounced as S-Q-L or sometimes as See-Quell.

This database language is mainly designed for maintaining the data in relational database management systems. It is a special tool used by data professionals for handling structured data (data which is stored in the form of tables). It is also designed for stream processing in RDBMS. You can easily create and manipulate the database, access and modify the table rows and columns, etc. This query language became the standard of ANSI in the year of 1986 and ISO in the year of 1987.If you want to get a job in the field of data science, then it is the most important query language to learn. Big enterprises like Facebook, Instagram, and LinkedIn, use SQL for storing the data in the back-end.

8. TESTING:

8.1. TEST CASES:

The purpose of testing is to discover errors. Testing is the process of trying to discover every conceivable fault or weakness in a work product. It provides a way to check the functionality of components, sub assemblies, assemblies and/or finished product lt is the process of exercising software with the intent of ensuring that the Software system meets its requirements and user expectations and does not fail in an unacceptable manner.

There are various types of tests. Each test type addresses a specific testing requirement. Following this step, a variety of tests are conducted.

Unit Testing

Unit testing involves the design of test cases that validate that the internal program logic is functioning properly, and that program inputs produce valid outputs. All decision branches and internal code flow should be validated. It is the testing of individual software units of the application; it is done after the completion of an individual unit before integration. This is a structural testing that relies on knowledge of its construction and is invasive. Unit tests perform basicTests at component level and test a specific business process, application, and/or System configuration. Unit tests ensure that each unique path of a business process performs accurately to the documented specifications and contains clearly defined inputs and expected results.

Integration Testing

Integration tests are designed to test integrated software components to determine if they actually run as one program. Testing is event driven and is more concerned with the basic outcome of screens or fields. Integration tests demonstrate that although the components were individually satisfied, as shown by successively unit testing, the combination of components is correct and consistent. Integration testing is specifically aimed at exposing the problem that arises from the combination of components.

Functional Testing

Functional tests provide systematic demonstrations that functions tested are available as specified by the business and technical requirements, system documentation, and user manuals.

Functional testing is centered on the following items:

Valid Input : identified classes of valid input must be accepted.

Invalid Input : identified classes of invalid input must be rejected.

Function : identified functions must be exercised.

Output : identified classes of application outputs must be exercised.
Systems/Procedures: interfacing systems or procedures must be invoked.

Organization and preparation of functional tests is focused on requirements, key functions, or special test cases. In addition, systematic coverage pertaining to identifying Business process flows; data fields, predefined processes, and successive processes must be considered for testing. Before functional testing is complete,additional tests are identified and the effective value of current tests is determined.

System Testing

System testing ensures that the entire integrated software system meets requirements. lt tests a configuration to ensure known and predictable results. An example of system testing 1s the configuration oriented system integration test. System testing is based on process descriptions and flows, emphasizing pre-driven process links and integration points.

White Box Testing

White Box Testing is a testing in which the software tester has knowledge of the inner workings, structure and language of the software, or at least its purpose. It has a purpose. It is used to test areas that cannot be reached from a blackbox level.

Black Box Testing

Black Box Testing is testing the software without any knowledge of the innerworkings, structure or language of the module being tested. Black box tests, as most other kinds of tests, must be written from a definitive source document, such as specification or requirements document, Such as specification or requirements document. It is a test in which the software under test is treated as a black box you cannot "see" into it. The test provides inputs and responds to outputs

without considering how the software works.

Unit Testing:

Unit test is usually conducted as part of a combined code and unit test and unit testing phase of the software lifecycle, although it is not uncommon for coding and unit tests to be conducted as two distinct phases.

Test strategy and approach

Field testing will be performed manually and functional tests will be written in detail.

Test objectives

All field entries must work properly.

Pages must be activated from the identified link.

The entry screen, messages and responses must not be delayed.

Features to be tested

Verify that the entries are of the correct format.

No duplicate entries should be allowed.

All links should take the user to the correct page.

Integration Testing

Software integration testing is the incremental integration testing of two or more integrated software components on a single platform to produce failures caused by interface defects.The task of the integration test is to check that components or software applications, e.g. components in a software system or-one step up-software applications at the company level - interact without error.

Test Results: All the test cases mentioned above passed successfully. No defects encountered.

8.2. USER ACCEPTANCE TESTING:

User Acceptance Testing is a critical phase of any project and requires significant participation by the end user. It also ensures that the system meets the functional requirements.

Test Results: All the test cases mentioned above passed successfully. No defects encountered.

9. RESULT:

9.1. PERFORMANCE METRICS:

1. Body composition

A well-structured nutrition plan should allow an individual to maintain a healthy physique within acceptable body fat levels (18-24% for men and 25-31% for women). This also means that it should support metabolic health through a number of means, such as promoting healthy hormone function, insulin sensitivity and physical recovery.

2. Healthy cholesterol levels and blood pressure

Monitoring your cholesterol levels and blood pressure is crucial because having a healthy weight doesn't discount the possibility of issues in these areas. While dietary cholesterol doesn't have as much effect on blood cholesterol levels as we once thought, it can still be influenced by your overall dietary fat intake. On the other end, excessive sodium intake can lead to hyper-extension, of which one of the symptoms happens to be elevated blood pressure levels.

3. Healthy skin and hair

The condition of your skin and hair are good indicators of the quality of your nutrition. If you are getting enough nutrients, your skin should be firm, supple and of a rich hue rather than flaking and pale. Your hair should be smooth and strong

rather than dry and brittle; unexplained hair loss is often a sign of malnutrition.

4. Sleep and energy levels

Getting the right amount of nutrients and calories will help you stay energized due to its ability to promote restful sleep. If you find yourself feeling sluggish, It could be a sign of either a distinct lack of calories and/or nutrients, driving your body into “starvation mode” which hampers its restorative capabilities.

5. Regular bowel movements

Your bowel movements reflect whether you are getting sufficient fiber from your diet, so if you find yourself being constipated, load up on more fruits and vegetables to get your digestive system going.

While these five indicators of a nutritious diet may give you a decent idea of how to go about achieving your nutrition goals, getting the help of a certified nutritionist can help improve your odds of success while avoiding the common pitfalls.

10. ADVANTAGES AND DISADVANTAGES:

ADVANTAGES:

1. Helps Manage Diabetes

Type-2 diabetes affects millions of people worldwide, irrespective of age. Unhealthy eating habits, obesity, insulin resistance, and genetic factors may lead to type 2 diabetes .Changing your eating habits and lifestyle can certainly help reduce the risk of type 2 diabetes and related complications. Avoid consuming excess sugar and junk foods. Eat healthy greens, beans, low-glycemic index foods, dark chocolate, and healthy snacks to keep your cravings and hunger pangs at bay.

2. Increases Immunity

Eating right can help boost immunity. A healthy immune system helps keep infectious diseases, autoimmune diseases, and the common flu at bay. It aids faster recovery and healing. Consume foods that are loaded with antioxidants, vitamins, and minerals.Eating healthy foods like blueberries, strawberries, oranges, grapefruit, other fruits rich in vitamin C, leafy greens, carrot, tomato, cheese, milk, fatty fish, herbs, and spices help improve your immunity.

3. Boosts Brain Health

Healthy eating boosts brain health and elevates your mood. Foods loaded with omega-3 fatty acids (olive oil, fatty fish, fish oil, nuts, and seeds) help maintain the cell membrane and normal brain function and facilitate synaptic plasticity. These foods are used as “diet therapy” for people suffering from dyslexia, attention deficit disorders, schizophrenia, depression, and bipolar disorder.

4. Improves Digestion

Eating healthy food promotes digestion. Vegetables, fruits, whole grains, and probiotics are essential for maintaining good gut health and improving digestion. Dietary fiber is found in fruits and vegetables. Dietary fiber cannot be digested by humans, but the good gut bacteria ferment it, which helps them thrive and survive.Dietary fiber also adds bulk to the stool and improves bowel movement, thereby reducing constipation.Probiotics like yogurt, buttermilk, kimchi, probiotic drinks, and sauerkraut help add more good gut bacteria, which, in turn, help improve digestion.

5. Delays Aging

Eating healthy foods has a direct impact on how fast you age. Fresh greens, fruits, lean protein, fatty fish, whole grains, green tea, herbs, and spices are loaded

with antioxidants, vitamins, minerals, and omega-3 fatty acids that help flush out the harmful free oxygen radicals from the body. This, in turn, helps maintain the DNA structure and slow down the aging process.

6. Improves Skin Health

Unhealthy oily junk food leads to breakouts and acne. The key to getting healthy skin is drinking water, green tea, coconut water and eating fruits, vegetables, fatty fish, nuts, seeds, and whole grains.Consume foods loaded with vitamin A, C, D, and E and omega-3 fatty acids, and avoid trans fats and sugary foods. Also, maintain good hygiene, and you will start seeing an improvement in your skin.

7. Reduces Stress

Vegetables and fruits are loaded with antioxidants. Antioxidants help reduce oxidative stress in the body, thereby reducing inflammation . Unhealthy foods do just the opposite. They have no nutritional value, and the trans fats and high sugar increase inflammation in the body, leading to an increase in oxidative stress.Avoid eating heavy, unhealthy, fat-loaded foods. In the long run, eating light and healthy foods is the best solution to physical and mental stress.

8. Improves Sleep Quality

Healthy eating also helps improve sleep quality. Late-night snacking on junk food or ice cream, having dinner at an odd time, and consuming oily and heavy foods disrupt the normal biological cycle. This increases the chances of obesity and metabolic syndrome (23). It leads to poor digestion and concentration and leaves you feeling uneasy.

Eating healthy and at least three hours before you go to bed aids digestion, lowers stress, and helps you get sound sleep.

DISADVANTAGES:

1. Nutrient Deficiencies

While it is likely to be adequate in protein and total fat, a poor diet can lead to deficiencies of certain nutrients. Good sources of calcium, an essential nutrient for building strong bones, include reduced-fat milk, cheese and yogurt, as well as some green vegetables, fortified soy products and breakfast cereals. Iron, vitamin D and folic acid are other vitamins and minerals that can be deficient. Long-chain omega-3 fatty acids called docosahexaenoic acid and eicosapentaenoic acid can lower your risk for heart disease. They are in fish and shellfish, which are frequently lacking in poor diets.

2. High Blood Pressure

A high-sodium diet is a risk factor for high blood pressure, which can increase your risk for stroke, heart disease and kidney disease. Processed foods tend to be high in sodium. Major contributors of sodium to the American diet include bread, cold cuts, sauces, condiments and dressings, pizza, burgers, Mexican-style dishes and pasta dishes. A high-potassium diet can help lower blood pressure, but a diet with poor nutrition can be low in potassium if it is low in sources such as vegetables, fruit, legumes, fish and reduced-fat dairy products.

3. High Cholesterol Levels

Many dietary factors affect your cholesterol levels, and your cholesterol levels affect your risk for heart disease. Pizza, baked desserts, ice cream and processed meats, such as sausage and bacon, are among the top sources of saturated fat. Processed snack foods and fried foods, such as french fries, doughnuts and onion rings, can contain trans fats, which raise "bad" cholesterol known as low-density lipoprotein and lower healthy or "good" cholesterol called high-density lipoprotein. A low intake of fruits, vegetables, beans and whole grains can keep your intake of

dietary fiber low. Fiber lowers LDL cholesterol levels and your risk for heart disease.

11. CONCLUSION:

Good nutrition promotes not only better physical health and reduced susceptibility to disease, but has also been demonstrated to contribute to cognitive development and academic success. Left to their own devices, children will not automatically select healthy foods. Good nutritional habits and a balanced diet aren't developed in one day, nor are they destroyed in one unbalanced meal. Healthful eating means a lifestyle of making choices and decisions, planning, and knowing how to make quick and wise choices when you haven't planned.What you learn about eating on this website on your own will help establish good dietary patterns for the rest of your life. Taking a break from home cooking and becoming responsible for choosing the foods you eat is part of the challenge of becoming a mature and an independent adult.It is a challenge that should not be taken lightly. The nutritional habits you develop now will be difficult to change in the coming years when your body stops growing and your lifestyle may become more sedentary.

Learning to make sensible choices from a confusing array of options is not easy, but the rewards are great. Eating nutritious and healthful food while maintaining your proper body weight will contribute to a better performance in the classroom, in the gym, and on the dance floor. You will feel and look your best.In contrast, a poor diet can lead to insidious health problems that can interfere with success in academic and social performance and may eventually mean confronting a serious long-term illness, such as heart disease or diabetes. Knowing how much and what to eat is important knowledge.

12. FUTURE SCOPE:

Nutrition Assistant is an application that provides assistance to the users on the maintenance of their dietary intake on an hourly, daily, or monthly basis. Most people are becoming conscious of what they are eating and how many calories they consume on a regular basis. Keeping track of your dietary intake and physical activity is difficult. However, you can keep a tab on the nutrition intake on a daily basis by using diet and nutrition tracking apps. These calories and fitness tracking mobile apps have proved to be quite beneficial to health-conscious people. With increased awareness about health and fitness, these apps have started gaining popularity. In this article, we are going to learn about developing a diet and nutrition app along with the features that need to be in such apps and the costs of app development.

13. APPENDIX:

SOURCE CODE:

INDEX.HTML

```
<!DOCTYPE html>
<html lang="en">
<head>
<meta charset="utf-8">
<meta content="width=device-width, initial-scale=1.0" name="viewport">
<title>Nutrition Assistant</title>
<meta content="" name="description">
<meta content="" name="keywords">
<!-- Google Fonts →
```

```
<link
href="https://fonts.googleapis.com/css?family=Open+Sans:300,300i,400,400i,600,
600i,700,700i|Roboto:300,300i,400,400i,500,500i,700,700i&display=swap"
rel="stylesheet">

<!-- Vendor CSS Files -->
<link href="../static/vendor/animate.css/animate.min.css" rel="stylesheet">
<link href="../static/vendor/aos/aos.css" rel="stylesheet">
<link href="../static/vendor/bootstrap/css/bootstrap.min.css" rel="stylesheet">
<link href="../static/vendor/bootstrap-icons/bootstrap-icons.css" rel="stylesheet">
<link href="../static/vendor/boxicons/css/boxicons.min.css" rel="stylesheet">
<link href="../static/vendor/glightbox/css/glightbox.min.css" rel="stylesheet">
<link href="../static/vendor/swiper/swiper-bundle.min.css" rel="stylesheet">
<!-- Template Main CSS File -->
<link href="../static/css/style.css" rel="stylesheet">
</head>
<body>
<!-- ======= Header ======= -->
<header id="header" class="fixed-top d-flex align-items-center header-
transparent">
<div class="container d-flex justify-content-between align-items-center">
<div class="logo">
<h1 class="text-light"><a href="{{url_for('user.Index')}}"><span>NUTRITION
ASSISTANT</span></a></h1>
</div>
<nav id="navbar" class="navbar">
<ul>
<li><a href="{{url_for('user.Index')}}" class="active">Home</a></li>
```

```
<li class="dropdown"><a href="#"><span>Pregnancy Tips</span> <i class="bi bi-chevron-down"></i></a>
<ul>
<li><a href="{{url_for('user.PregnancyFood')}}">Recipes</a></li>
<li><a href="{{url_for('user.PregnancyFruit')}}">Fruits</a></li>
</ul>
</li>
<li class="dropdown"><a href="#"><span>Weight Gain</span> <i class="bi bi-chevron-down"></i></a>
<ul>
<li><a href="{{url_for('user.WeightGainFood')}}">Recipies</a></li>
<li><a href="{{url_for('user.WeightGainFruit')}}">Fruits</a></li>
</ul>
</li>
<li class="dropdown"><a href="#"><span>Weight Loss</span> <i class="bi bi-chevron-down"></i></a>
<ul>
<li><a href="{{url_for('user.WeightLossFood')}}">Recipes</a></li>
<li><a href="{{url_for('user.WeightLossFruit')}}">Fruits</a></li>
</ul>
</li>
<li><a href="{{url_for('user.ChatBox')}}" class="get started">Help Us</a></li>
</ul>
<i class="bi bi-list mobile-nav-toggle"></i>
</nav><!-- .navbar -->
</div>
</header><!-- End Header -->
```

<!-- ======= Hero Section ======= →
<section id="hero" class="d-flex justify-content-center align-items-center">

<!-- Slide 1 →

<h2 class="animate__animated animate__fadeInDown">Welcome to Nutrition Assistant</h2>
"Eating healthy nutritious food is the simple and the right solution to get rid of excess body weight effortlessly and become slim and healthy forever."

<!-- Slide 2 →

<h2 class="animate__animated animate__fadeInDown">Welcome to Nutrition Assistant</h2>
"Our body doesn't know how to digest these food-like products resulting in stress and weight gain. Nourish your body with real food, and it will shine for you".

<!-- Slide 3 -->

<h2 class="animate__animated animate__fadeInDown">Welcome to
Nutrition Assistant</h2>
"Diet is the essential key to all successful healing. Without a properly balanced diet, the effectiveness of herbal treatment is very limited."

</section><!-- End Hero -->
<main id="main">
<!-- ======= Why Us Section ======= -->
</main><!-- End #main -->

<!-- Vendor JS Files -->
<script src="../static/vendor/purecounter/purecounter_vanilla.js"></script>
<script src="../static/vendor/aos/aos.js"></script>
<script src="../static/vendor/bootstrap/js/bootstrap.bundle.min.js"></script>
<script src="../static/vendor/glightbox/js/glightbox.min.js"></script>
<script src="../static/vendor/isotope-layout/isotope.pkgd.min.js"></script>
<script src="../static/vendor/swiper/swiper-bundle.min.js"></script>
<script src="../static/vendor/waypoints/noframework.waypoints.js"></script>
<script src="../static/vendor/php-email-form/validate.js"></script>
USER CONTROLLER.PY

<!-- Template Main JS File -->
<script src="../static/js/main.js"></script>
</body>

```
</html>
from flask import request, Blueprint, jsonify, redirect, url_for,flash, render_template,session,json
from core.model.UserModel import UserModel
from flask import session, app
from flask import Flask
from core import app
app = Blueprint('user', __name__)
@app.route('/login')
def Login():
	return render_template('login.html')
@app.route('/')
def Home():
	return render_template('login.html')
@app.route('/index')
def Index():
	return render_template('index.html')
@app.route('logout', methods = ["GET", "POST"])
def Logout():
	session.pop('admin')
	session.pop('_flashes', None)
	return redirect(url_for('user.Login'))
@app.route('/post_login', methods = ["GET", "POST"])
def PostLogin():
	email	= request.form['email']
	password	= request.form['password']
	userData = UserModel().getUserByEMAIL(email)
```

```
        if userData :
                if password == userData['password'] :
                        session['admin'] =  userData
                        return redirect(url_for('user.Index'))
                else:
                        flash("Password mismatch.")
                        return redirect(url_for('user.Login'))
        else :
                flash("Email-id not registered.")
                return redirect(url_for('user.Login'))
@app.route('/signup',methods=["GET","POST"])
def Signup():
        return render_template('signup.html')
@app.route('/post_signup',methods=["POST"])
def PostSignup():
        username = request.form['username']
        email = request.form['email']
        password = request.form['password']
        con_password = request.form['con_password']
        data = {
        'name'  : username,
        'email'  : email,
        'password' : password,
        'con_password' : con_password
        }
        savedata = UserModel().insert_regi(data)
        flash("Data Saved")
```

```
        return redirect(url_for('user.Login'))
@app.route('/pregnancy_food')
def PregnancyFood():
        return render_template('pregnancy_food.html')
@app.route('/pregnancy_fruit')
def PregnancyFruit():
        return render_template('pregnancy_fruit.html')
@app.route('/weight_gain_food')
def WeightGainFood():
        return render_template('weight_gain_food.html')
@app.route('/weight_gain_fruit')
def WeightGainFruit():
        return render_template('weight_gain_fruits.html')
@app.route('/weight_loss_food')
def WeightLossFood():
        return render_template('weight_loss_food.html')
@app.route('/weight_loss_fruits')
def WeightLossFruit():
        return render_template('weight_loss_fruits.html')
@app.route('/chat_box')
def ChatBox():
        return render_template('chat_box.html')
```

GITHUB AND PROJECT DEMO LINK:

GITHUB LINK

https://github.com/IBM-EPBL/IBM-Project-47440-1660799363

PROJECT DEMO LINK

https://youtu.be/uQkaRVXxG_Q