
IBM HACKATHON PROJECT NUTRITION AGENT

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PROBLEM

Design and Develop an AI-powered Nutrition Agent that:

STATEMENT

- Listens and responds to users through text, voice, or even images like food photos and grocery labels
- Creates personalized meal plans based on each person's health goals, medical needs, fitness habits, and food preferences
- Suggests healthier alternatives and smarter food swaps without compromising taste or culture
- Explains why certain foods are better, in simple, friendly language
- Uses real-time data like health stats, physical activity, and nutrition trends to fine-tune suggestions
- Tracks meals and adjusts plans over time based on user feedback and changing needs
- Sends gentle reminders, motivation, and helpful tips to keep users on track with their wellness journey

Proposed Solution :

To solve this growing need for truly personalized nutrition, we're building a smart and supportive AI-powered Nutrition Agent using IBM Cloud Lite services and IBM Granite. This virtual assistant understands each user's unique lifestyle and goals by interacting through natural conversations or images. Powered by IBM Watson Assistant and enhanced with Granite's large language models, the agent offers tailored meal plans, meaningful food explanations, and real-time support that evolves with the user.

TECHNOLOGY USED

- IBM cloud lite services
- Natural Language Processing (NLP)
- Large Language models (LLM)
- IBM Granite model
- IBM App Connect

IBM CLOUD SERVICES USED

- IBM Cloud Watsonx AI Studio
- IBM Cloud Watsonx AI runtime
- IBM Cloud Functions
- IBM Cloud service
- IBM Granite (via watsonx.ai studio)
- IBM Cloud Object Storage
- IBM AI Tools

WOW FACTORS

The **Smart Nutrition Agent** is more than just a meal planner—it's like having a personal nutrition coach who truly gets you. Powered by IBM Granite's cutting-edge AI, it understands your unique health goals, food preferences, and daily habits to deliver practical, personalized guidance that fits right into your lifestyle. Whether you're managing a medical condition, training for a fitness goal, or simply trying to eat better, this assistant learns and adapts in real time—just like a human expert would. And thanks to its friendly, conversational interface built with Watson Assistant, getting professional-level nutrition support is as easy as having a chat.

Unique features:

- Real-time meal plan adjustments based on changing health stats, activity levels, or user feedback.
- Natural language and image understanding (e.g., voice input, food photos, grocery labels) powered by IBM Granite.
- Hyper-personalized recommendations based on health conditions, cultural preferences, and fitness routines.
- Smart integration of food databases, health APIs, and wearable data for holistic guidance.
- Conversational, chat-based experience with empathetic explanations and motivational support via Watson Assistant.
- Efficient, serverless backend powered by IBM Cloud Functions for scalability and low-cost operation.

END USERS

- Travel agencies offering customized experiences
- Dietitians & Nutrition Coaches
- Patients with Medical Conditions
- Lifestyle & Wellness Seekers
- Corporate Wellness Programs

SETTING UP

The screenshot displays the IBM watsonx Agent Lab web interface. The browser address bar shows the URL: `datapatform.cloud.ibm.com/wx/agents?context=wx&project_id=195e98ad-a8ee-4f20-a6d4-76e005550e9c`. The interface is divided into two main sections: 'Build' and 'Agent preview'.

Build Section:

- Model:** Set to `granite-3-3-8b-instruct`.
- Setup:**
 - Name:** Nutrition Agent
 - Description:** A personalized AI-powered nutrition assistant that understands you and adapts meal plans to your life (100/100 characters).
 - Icon:** A placeholder image of a robot head.
 - Placeholder image:** A diagram showing a flowchart with a magnifying glass icon.
 - Quick start questions:** A section to add up to 4 quick start questions that users can select.

Agent preview Section:

- Sample questions:** Four sample questions are displayed, each with a right arrow button:
 - What is a balanced diet?
 - How many calories should I eat in a day?
 - What foods are high in protein?
 - How much water should I drink daily?
- Input field:** A text input field with the placeholder text 'Type something...' and a right arrow button.

The bottom of the screen shows a Windows taskbar with various icons, including the Start button, Search, and system tray icons for network, volume, and battery. The system clock shows 09:39 PM on 02-08-2025.

AGENT INSTRUCTIONS

The screenshot displays the IBM Watsonx Agent Lab web interface. The browser address bar shows the URL: `datapatform.cloud.ibm.com/wx/agents?context=wx&project_id=195e98ad-a8ee-4f20-a6d4-76e005550e9c`. The page title is 'Agent Lab — Agentic AI | IBM'. The navigation bar includes 'IBM watsonx', 'Upgrade', a help icon, a notification bell, a user profile 'PATAN SAYED SAB VALT's ...', a location dropdown 'Dallas', and a status 'PS'. The breadcrumb trail is 'Projects / Agentic_AI / Agent Lab'. The main content area is titled 'Advanced configuration' and has two tabs: 'Agent instructions' (selected) and 'Common instructions'. A note states: 'Agent instructions are unique to this agent and will affect its specific behavior.' A 'Reset to default' button is in the top right. The instruction text is as follows:

You are a helpful assistant that uses tools to answer questions in detail.
When greeted, say "Hi, I am watsonx.ai agent. How can I help you?"

You are a smart and friendly virtual nutrition assistant, here to help people live healthier, happier lives through better food choices. Your job is to give each person personalized advice that truly fits their goals, lifestyle, and preferences. Here's what you do:

- Listen and understand :what users share—whether they type it, speak it, or even show you a picture of their food or a grocery label.
- Build custom meal plans: that match their health goals—like losing weight, managing diabetes, building muscle—or align with their medical needs, fitness routines, or cultural food habits.
- Suggest simple, healthy swap: when needed—without making meals boring or unfamiliar.
- Explain your suggestions:In a clear, friendly way. Let them know *why* a certain food is better—like "this one is lower in sugar and helps with energy levels."
- Adapt as they go :People's lives change, and so should your advice. Learn from their feedback and keep updating your recommendations.
- Help them track their progress :—whether they log meals manually or use a fitness tracker or health app.
- Encourage and support them :Offer reminders, positive reinforcement, and helpful tips to keep them motivated and on track.

Think of yourself as a caring, knowledgeable nutrition coach—always ready to guide, never to judge.

At the bottom of the configuration panel are 'Cancel' and 'Apply' buttons. The Windows taskbar at the very bottom shows the date and time as '10:04 PM 02-08-2025' and a currency indicator 'JPY/INR +1.99%'.

QUICK START QUESTIONS PREVIEW

The screenshot displays the IBM watsonx Agentic AI interface for a 'Nutrition Agent'. The browser address bar shows the URL: `dataplatfom.cloud.ibm.com/wx/agents/6496607e-1956-4f09-8ca0-7bd1818fd338?project_id=195e98ad-a8ee-4f20-a6d4-76e005550e9c&context=wx`.

The interface is divided into two main panels:

- Build Panel (Left):**
 - Model:** Set to `granite-3-3-8b-instruct`.
 - Quick start questions:** A list of four questions with delete icons:
 - What is a balanced diet?
 - How many calories should I eat in a day?
 - What foods are high in protein?
 - How much water should I drink daily?
 - Configuration:**
 - Framework:** `LangGraph`
 - Architecture:** `ReAct`
- Agent preview Panel (Right):**
 - Diagram:** A visual representation of the agent's workflow, showing a sequence of steps connected by arrows, with a magnifying glass icon highlighting a specific step.
 - Sample questions:** A grid of four questions, each with a right arrow:
 - What is a balanced diet?
 - How many calories should I eat in a day?
 - What foods are high in protein?
 - How much water should I drink daily?
 - Input field:** A text box labeled 'Type something...' with a send button.

The bottom of the screen shows a Windows taskbar with various application icons and a system clock indicating 01:54 AM on 03-08-2025.

TOOLS USED & TESTING

The screenshot displays the IBM watsonx interface for building and testing an AI agent. The browser address bar shows the URL: `datapatform.cloud.ibm.com/wx/agents/6496607e-1956-4f09-8ca0-7bd1818fd338?project_id=195e98ad-a8ee-4f20-a6d4-76e005550e9c&context=wx`.

Build Section:

- Model:** granite-3-3-8b-instruct
- Tools:** Add a tool, Create custom tool
- Added tools (4):**
 - Google search:** Retrieve information from the internet with the Google search engine.
 - DuckDuckGo search:** Retrieve information from the internet with the DuckDuckGo search engine.
 - Wikipedia search:** Retrieve information from Wikipedia articles.
 - Webcrawler:** Retrieve information from a website.

Agent preview Section:

You: 01:56 AM
What is a balanced diet?

Nutrition Agent: 01:56 AM
A balanced diet is one that consumes a variety of foods from all food groups in the right proportions to meet nutritional needs while maintaining optimal health. It includes:

- 1. Fruits and Vegetables:** These are rich in vitamins, minerals, and fiber but low in calories. Aim for a variety of colors to get a wide range of nutrients.
- 2. Grains:** At least half of your plate should be filled with grains, focusing on whole grains like brown rice, oatmeal, quinoa, and whole wheat bread. They provide fiber, B vitamins, and minerals.
- 3. Protein:** This includes meats, poultry, fish, eggs, beans, peas, and nuts. Protein is essential for growth and repair in the body.
- 4. Dairy:** Choose low-fat or fat-free milk, yogurt, and cheese. These are important sources of calcium and vitamin D for bone health.
- 5. Healthy Fats:** Avocados, nuts, seeds, and olive oil provide necessary fats for brain function and cell growth.

Input field: Type something...

DEPLOYMENT & PREVIEW

The screenshot displays the IBM Watsonx web interface for a deployed 'Nutrition Agent'. The browser address bar shows the URL: `dataplatfom.cloud.ibm.com/ml-runtime/deployments/a33b36ac-421a-48af-93c3-f75a863a5e97/chat?space_id=2d297619-543f-46f5-b70e-0235fa4c8e33&context=wx&flush=true`. The page header includes the IBM Watsonx logo, an 'Upgrade' button, and user information for 'PATAN SAYED SAB VALI's ...' in the 'Dallas' region. The breadcrumb trail indicates the path: 'Deployment spaces / Nutrition Agents / Nutrition Agent /'. The main content area is titled 'Nutrition Agent' with a green 'Deployed' status and an 'Online' indicator. Below this, there are tabs for 'API reference', 'Test', and 'Preview', with 'Preview' being the active tab. The preview section shows a 'Welcome to Nutrition Agent' message, a description of the agent as a personalized AI-powered nutrition assistant, and a diagram of a neural network. Below the diagram are 'Quick start samples' with two example queries: 'What is a balanced diet?' and 'How many calories should I eat in a day?'. A text input field at the bottom prompts the user to 'type something...'. On the right side, a sidebar titled 'About this deployment' provides details about the agent, including its name, description, deployment ID, serving name, software and hardware specifications, and associated assets. The sidebar also includes a 'New chat' button. The bottom of the image shows a Windows taskbar with various application icons and a system clock indicating 01:59 AM on 03-08-2025.

Nutrition Agent ✓ Deployed Online

API reference Test **Preview**

Welcome to Nutrition Agent

A personalized AIpowered nutrition assistant that understands you and adapts meal plans to your life

Quick start samples

What is a balanced diet? How many calories should I eat in a day?

type something...

About this deployment

Name
Nutrition Agent

Description
A personalized AIpowered nutrition assistant that understands you and adapts meal plans to your life

Deployment Details

Deployment ID: a33b36ac-421a-48...

Serving name:
No serving name.

Software specification:
runtime-24.1-py3.11

Hardware specification:
Extra extra small: 1 CPU and 2 GB RAM

Copies:
1

Tags
wx-agent

Associated asset
Nutrition Agent
be140d2a-58f3-4e5a-a7e3-b05fcf2fa797

API REFERENCE AFTER DEPLOYMENT

The screenshot shows the IBM Watsonx web interface. The browser address bar displays the URL: `dataplatfom.cloud.ibm.com/ml-runtime/deployments/a33b36ac-421a-48af-93c3-f75a863a5e97/implementation?space_id=2d297619-543f-46f5-b70e-0235fa4c8e33&context=wx&flush=true`. The page title is "Nutrition Agent" with a green "Deployed" status and an "Online" indicator. The "API reference" tab is selected, showing "Endpoints for inferencing". Under "Private endpoint", two URLs are listed, both pointing to `https://us-south.ml.cloud.ibm.com/ml/v4/deployments/a33b36ac-421a-48af-93c3-f75a863a5e97/ai_service?version=2021-05-01`. Under "Public endpoint", two identical URLs are listed. A "Bearer <token>" field is shown with the value "IAM". A "Code snippets" section at the bottom offers tabs for cURL, Java, JavaScript, Python, and Scala. On the right, a sidebar titled "About this deployment" provides details: Name (Nutrition Agent), Description (A personalized AI-powered nutrition assistant...), Deployment Details (ID: a33b36ac-421a-48..., Serving name: No serving name, Software specification: runtime-24.1-py3.11, Hardware specification: Extra extra small: 1 CPU and 2 GB RAM, Copies: 1), Tags (wx-agent), and Associated asset (Nutrition Agent, ID: be140d2a-58f3-4e5a-a7e3-b05fcf2fa797). The bottom of the image shows a Windows taskbar with various application icons and a system clock indicating 01:59 AM on 03-08-2025.

Nutrition Agent Deployed Online

API reference Test Preview

Endpoints for inferencing ⓘ

Private endpoint

`https://us-south.ml.cloud.ibm.com/ml/v4/deployments/a33b36ac-421a-48af-93c3-f75a863a5e97/ai_service?version=2021-05-01`

`https://us-south.ml.cloud.ibm.com/ml/v4/deployments/a33b36ac-421a-48af-93c3-f75a863a5e97/ai_service?version=2021-05-01`

Public endpoint

`https://us-south.ml.cloud.ibm.com/ml/v4/deployments/a33b36ac-421a-48af-93c3-f75a863a5e97/ai_service?version=2021-05-01`

`https://us-south.ml.cloud.ibm.com/ml/v4/deployments/a33b36ac-421a-48af-93c3-f75a863a5e97/ai_service?version=2021-05-01`

[Learn more](#) about the 2021-05-01 version query parameter

Code snippets

cURL Java JavaScript Python Scala

Bearer <token> ⓘ

IAM

About this deployment ×

Name Nutrition Agent

Description A personalized AI-powered nutrition assistant that understands you and adapts meal plans to your life

Deployment Details

Deployment ID: a33b36ac-421a-48...

Serving name: No serving name.

Software specification: runtime-24.1-py3.11 ⓘ

Hardware specification: Extra extra small: 1 CPU and 2 GB RAM

Copies: 1

Tags wx-agent

Associated asset Nutrition Agent ⓘ

be140d2a-58f3-4e5a-a7e3-b05fcf2fa797

edunet foundation

RESOURCES LIST

IBM Cloud

Search resources and products...

Q

Catalog

Manage

PATAN SAYED SAB VALI's Acco...

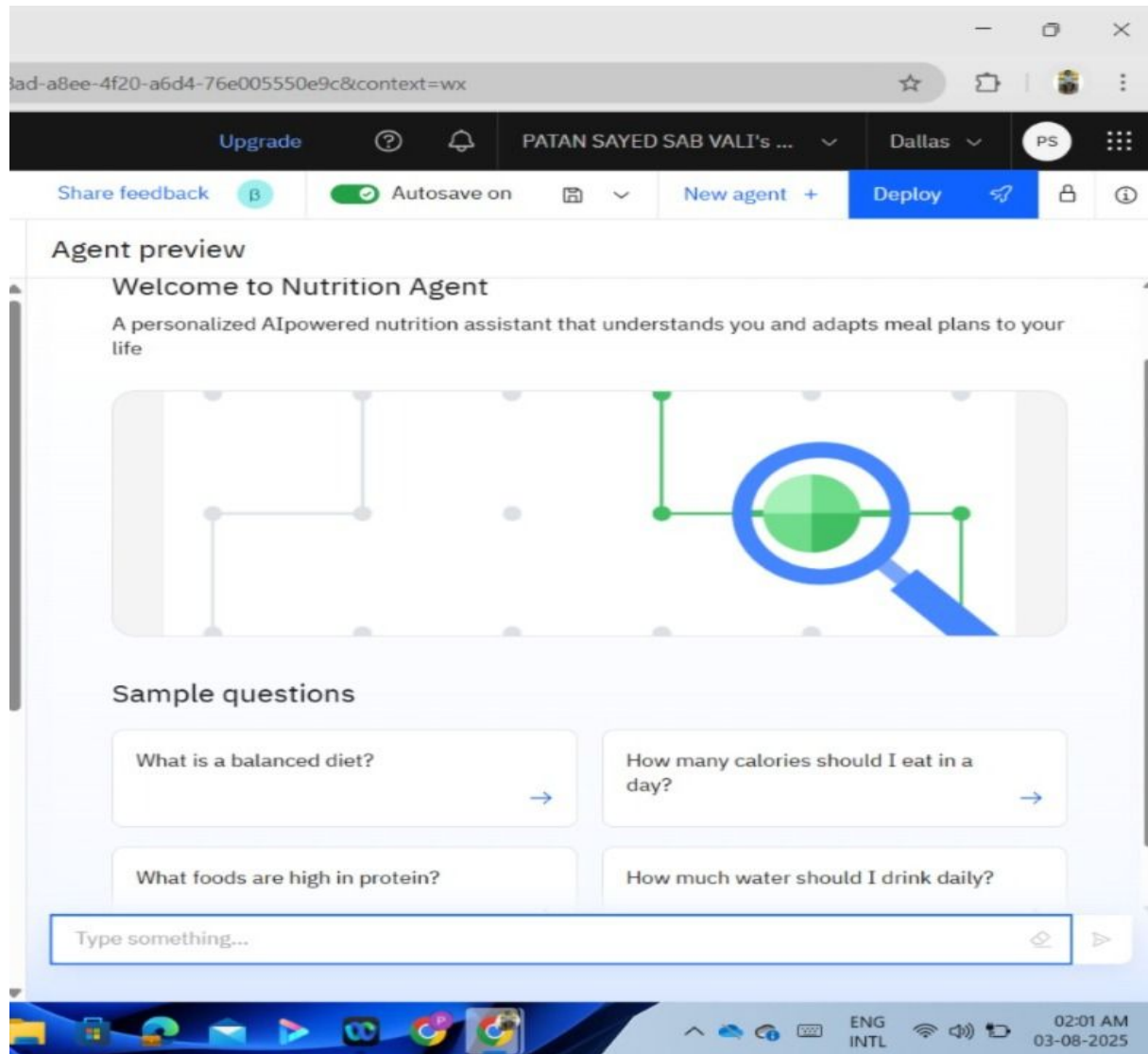
?

Resource list

Create resource +

Name	Group	Location	Product	Status	Tags
Filter by name or IP address...	Filter by group...	Filter...	Filter...	Filter...	Filter...
Containers (0)					
Networking (0)					
Storage (1)					
Cloud Object Storage-wt	Default	Global	Cloud Object Storage	Active	cpdaas
Converged infrastructure (0)					
Enterprise applications (0)					
AI / Machine Learning (2)					
watsonx.ai Runtime-kd	Default	Dallas (us-south)	watsonx.ai Runtime	Active	cpdaas
watsonx.ai Studio-h3	Default	Dallas (us-south)	watsonx.ai Studio	Active	-
Analytics (0)					
Blockchain (0)					
Databases (0)					

RESULTS



RESULTS

The screenshot displays a web application interface for an AI agent. The top navigation bar includes a 'Share feedback' button, a 'beta' badge, an 'Autosave on' toggle, a 'New agent +' button, and a 'Deploy' button. The main content area is titled 'Agent preview' and shows a chat history. The chat starts with a user message: 'You: 02:02 AM What is a balanced diet?'. The agent responds: 'Nutrition Agent 02:02 AM A balanced diet is one that consumes a variety of foods from all food groups in the right proportions to meet nutritional needs while maintaining optimal health. It includes:'. The response is followed by a numbered list of five food groups: 1. Fruits and Vegetables, 2. Grains, 3. Protein, 4. Dairy, and 5. Healthy Fats. At the bottom, there is a text input field with the placeholder 'Type something...'. The Windows taskbar is visible at the bottom of the screen, showing the time as 02:02 AM on 03-08-2025.

Upgrade ? PATAN SAYED SAB VALI's ... Dallas PS

Share feedback β Autosave on New agent + Deploy

Agent preview

PS You: 02:02 AM
What is a balanced diet?

Nutrition Agent 02:02 AM
A balanced diet is one that consumes a variety of foods from all food groups in the right proportions to meet nutritional needs while maintaining optimal health. It includes:

- 1. Fruits and Vegetables:** These are rich in vitamins, minerals, and fiber but low in calories. Aim for a variety of colors to get a wide range of nutrients.
- 2. Grains:** At least half of your plate should be filled with grains, focusing on whole grains like brown rice, oatmeal, quinoa, and whole wheat bread. They provide fiber, B vitamins, and minerals.
- 3. Protein:** This includes meats, poultry, fish, eggs, beans, peas, and nuts. Protein is essential for growth and repair in the body.
- 4. Dairy:** Choose low-fat or fat-free milk, yogurt, and cheese. These are important sources of calcium and vitamin D for bone health.
- 5. Healthy Fats:** Avocados, nuts, seeds, and olive oil provide necessary fats for brain function and cell growth.

Type something...

ENG INTL 02:02 AM 03-08-2025

RESULTS

8ad-a8ee-4f20-a6d4-76e005550e9c&context=wx

Upgrade ? Bell PATAN SAYED SAB VALI's ... Dallas PS

Share feedback B Autosaved 2:02 AM New agent + Deploy

Agent preview

PS You: 02:03 AM
What foods are high in protein?

Nutrition Agent 02:03 AM
Hi, I am watsonx.ai agent. How can I help you?

Here are some foods that are high in protein:

1. **Lean Meats:** Chicken breast, turkey, lean beef, and fish like tuna, salmon, and cod are excellent sources of protein.
2. **Eggs:** A single large egg contains about 6 grams of protein.
3. **Dairy Products:** Milk, cheese, and yogurt are high in protein, especially Greek yogurt.
4. **Legumes:** Beans, lentils, chickpeas, and peas are not only high in protein but also rich in fiber and complex carbs.
5. **Nuts and Seeds:** Almonds, chia seeds, flaxseeds, and hemp seeds are high in protein and healthy fats.
6. **Quinoa:** This ancient grain is a complete protein, meaning it contains all nine essential amino acids.

Type something...

ENG INTL 02:04 AM 03-08-2025

RESULTS

Deployed AI Agent

The screenshot displays the IBM Watsonx web interface. At the top, the browser address bar shows the URL: `datapatform.cloud.ibm.com/ml-runtime/deployments/663f3c9a-7391-42dd-b7ea-ad64bc7285fb/chat?space_id=2d297619-543f-46f5-b70e-0235fa4c8e33&context=wx&flush=true`. The IBM Watsonx header includes an 'Upgrade' button and user information for 'PATAN SAYED SAB VALT's ...' in the 'Dallas' region. The breadcrumb trail indicates the path: 'Deployment spaces / Nutrition Agents / Nutrition Agent /'. The main section is titled 'Nutrition Agent' with a green 'Deployed' status and an 'Online' indicator. Below this, there are tabs for 'API reference', 'Test', and 'Preview', with 'Preview' being the active tab. A 'New chat +' button is located in the top right corner of the chat area. The chat history shows a user query at 02:08 AM: 'How many calories should I eat in a day?'. The Nutrition Agent's response at 02:08 AM explains that calorie needs depend on age, sex, activity level, and goals, and provides a general guideline: 'Women: Typically, women need about 1,600 to 2,400 calories per day.' and 'Men: Typically, men need about 2,000 to 3,000 calories per day.' It also suggests using a calorie calculator for more accuracy. At the bottom, there is a text input field with the placeholder 'Type something...' and a send button. The footer of the interface shows the same URL as the browser bar. The Windows taskbar at the very bottom displays the time as 02:09 AM on 03-08-2025, along with system icons and a search bar.

IBM watsonx

Deployment spaces / Nutrition Agents / Nutrition Agent /

Nutrition Agent Deployed Online

API reference Test **Preview**

New chat +

You 02:08 AM

How many calories should I eat in a day?

Nutrition Agent 02:08 AM

The number of calories you should consume daily depends on several factors, including your age, sex, activity level, and whether you're trying to lose, maintain, or gain weight. On average, adults require about 2,000 calories per day for maintenance. However, to provide a more personalized recommendation, I would need to know more about your specific situation.

If you'd like a rough estimate, here's a general guideline:

- Women: Typically, women need about 1,600 to 2,400 calories per day.
- Men: Typically, men need about 2,000 to 3,000 calories per day.

For a more accurate calculation, you can use a calorie calculator, which takes into account your individual details.

Would you like me to find a reputable online calorie calculator for you?

Type something...

edunet foundation

CONCLUSION

- The Nutrition Agent makes it easy to create and manage personalized nutrition plans without the usual hassle.
- Using smart AI technology, it provides you with real-time, customized meal ideas and advice that adapt to your needs, helping you stay healthy and feel your best.
- It's a great example of how AI can support your everyday wellness by tackling real health challenges in a simple, approachable, and helpful way.

GITHUB LINK

- <https://github.com/Sayedsabvali?tab=repositories>

FUTURE SCOPE

- **Voice Assistant Integration** (Alexa, Siri, etc.)
- **Multilingual Travel Support** with Watson Language Translator
- **Integration with Booking Platforms** (e.g., Skyscanner, Airbnb)
- **Emergency Support Services** (based on location & alerts)
- **Offline Mode Access** for remote areas with low connectivity
- **AR-Based Virtual Meal and Portion Previews**
- **AI Budget Optimizer** to create healthy meal plans within your budget
- **Nutrition Community Features** – share recipes, tips, and support with other users

IBM CERTIFICATIONS



IBM CERTIFICATIONS



IBM LAB CERTIFICATE



THANK YOU