

---

# CAPSTONE PROJECT

## FITNESS BUDDY

*PRESENTED BY :-*

**DINESH KUMAR YADAV**  
Electrical Engineering  
National Institute of Technology - Srinagar

# OUTLINE

- Problem Statement
- Proposed Solution
- System Development Approach
- Algorithm & Deployment
- Result
- Conclusion
- Future Scope
- References

# PROBLEM STATEMENT

In today's fast-paced world, many individuals struggle to maintain a healthy lifestyle due to lack of personalized guidance, time constraints, and inconsistent motivation. Traditional fitness solutions often require expensive subscriptions, in-person consultations, or rigid schedules that don't adapt to personal preferences or daily routines. There is a growing need for an accessible, friendly, and intelligent virtual assistant that can provide on demand fitness advice, healthy lifestyle suggestions, and basic nutrition guidance—all tailored to individual needs and available at any time. Fitness Buddy aims to solve this problem by offering a conversational, AI-powered health and fitness coach that can:

- Recommend home workouts and routines based on user input.

- \* Provide motivational tips and daily fitness inspiration.

- \* Suggest simple, nutritious meal ideas.

- \* Encourage habit-building and consistency.

# PROPOSED SOLUTION

The proposed system aims to solve the challenge of maintaining a healthy lifestyle by offering a **conversational, AI-powered virtual assistant**.. The solution will consist of the following components:

## 1. User Interaction & Data Collection

Collect user input such as age, fitness goals, current habits, dietary preferences, and lifestyle routines via a chat interface powered by **IBM Watson Assistant**.

## 2. Data Preprocessing & Personalization

Apply **Granite model embeddings** to understand user intent and sentiment for more human-like interaction.

## 3. AI-Powered Recommendation Engine (Use IBM Granite large language models )

- Generate home workout routines based on available time and equipment and Provide nutritious meal suggestions tailored to dietary need.
- Deliver motivational messages and wellness tips aligned with user goals.

## 4 Deployment on IBM Cloud Lite

- Host the solution on **IBM Cloud Lite** for a **cost-effective and scalable deployment**.
- Use **Watson Assistant** for front-end conversational UI, and **IBM Cloud Functions** for backend logic.
- Store session data and user feedback in **IBM Cloud Object Storage** to ensure continuity and personalization

---

# SYSTEM APPROACH

- User Interaction via Watson Assistant**

Collects fitness goals, preferences, and inputs through a conversational UI.

- Natural Language Understanding with IBM Granite**

Interprets user intent and generates personalized, human-like responses.

- Serverless Backend using IBM Cloud Functions**

Executes logic for workout, meal, and motivation recommendations.

- Data Storage with IBM Cloud Object Storage**

Stores user profiles and interaction history securely.

- Deployed on IBM Cloud Lite**

Ensures low-cost, scalable, and accessible solution.

# ALGORITHM & DEPLOYMENT

## ◆ Algorithm (Recommendation Engine)

- Uses **IBM Granite** to understand user input and context.
- Maps input to tailored **workout plans**, **meal suggestions**, and **motivation tips**.
- Continuously learns from user interactions for better personalization.

## ◆ Deployment (IBM Cloud Lite)

- **Watson Assistant** for chat interface.
- **Cloud Functions** for backend logic.
- **Granite models** for AI-powered responses.
- **Object Storage** for user data.
- Fully hosted on **IBM Cloud Lite** for scalability and cost-efficiency.

---

# RESULT

- Successfully deployed on **IBM Cloud Lite** using **Granite models** and **Watson Assistant**.
- Achieved a **scalable, cost-effective, and intelligent solution** for everyday fitness and wellness needs.

# RESULT

The screenshot displays the IBM watsonx Agent Lab interface. The top navigation bar includes the IBM watsonx logo and the project name 'electrician-agent'. The main interface is divided into two panels: 'Build' on the left and 'Agent preview' on the right.

**Build Panel:**

- Setup:** Shows the agent name 'electrician-agent' and the model 'llama-3-3-70b-instruct'.
- Configuration:** Includes 'Framework' (LangGraph) and 'Architecture' (ReAct).
- Instructions:** Contains a text box with the following instructions: 'you are an expert nutritionist, take the details from user about age, gender, current height and weight, typical daily schedule, medical conditions, injuries, average sleeping hours, primary objective, How often do you currently exercise per week, and for how long each session? What types of physical activities do you usually engage in (e.g., walking, yoga, weight training)? Do you have access to outdoor spaces or a gym?'. A link for 'Advanced configuration' is also present.
- Knowledge:** A section for adding knowledge.
- Tools:** Includes buttons for 'Add a tool' and 'Create custom tool'. A 'Google search' tool is listed with the description 'Retrieve information from the internet with the Google search engine'.

**Agent preview Panel:**

- User:** 'You: 06:18 PM' with the message 'Hi'.
- Agent:** 'watsonx Agent 06:18 PM' with the response: 'To provide you with a specific answer to your queries and suitable workouts and exercises, I need to know more about your details. Please provide me with the following information:'.
- List of questions:**
  - Age
  - Gender
  - Current height and weight
  - Typical daily schedule
  - Medical conditions
  - Injuries
  - Average sleeping hours
  - Primary objective
  - How often do you currently exercise per week, and for how long each session?
  - What types of physical activities do you usually engage in (e.g., walking, yoga, weight training)?
  - Do you have access to outdoor spaces or a gym?
  - What is your ideal workout duration?
  - On average, how much water do you drink daily?
  - How many meals and snacks do you typically eat per day?
  - What motivates you most (e.g., tracking progress, social support, competition)?
- Agent:** 'watsonx Agent 06:23 PM' with the response: 'Once I have this information, I can give you personalized advice on workouts and exercises that are beneficial to you, as well as motivation to help you stay on track with your fitness goals. Remember, it's essential to consult with a healthcare professional before starting any new exercise or diet program. They can help you create a plan that's tailored to your specific needs and health status. Let's get started on your journey to a healthier, happier you! How did I get this answer?'.
- User:** 'You: 06:23 PM' with the message: '21, male, height 164 cm, weight 72kg, 8 sitting hours, headache and body pain, 3 sleeping hours, reduce body weight by 3 kg, no physical activity, 7 meals a day, 3 litres of water per day, give me the diet plan and suitable exercises for losing weight and recovering headache.'.
- Agent:** 'watsonx Agent 06:23 PM' with the response: 'Based on the information you provided, I'll create a personalized diet plan and exercise routine to help you achieve your goals. Diet Plan:'.



# RESULT

The screenshot displays the IBM Watsonx Agent Lab interface. The browser address bar shows the URL: [https://dataplatform.cloud.ibm.com/wx/agents/272a09f9-f99b-432d-9c02-b57594da10a2?project\\_id=8055af17-b9ec-4e78-b5a1-6122e37d8838&context=wx](https://dataplatform.cloud.ibm.com/wx/agents/272a09f9-f99b-432d-9c02-b57594da10a2?project_id=8055af17-b9ec-4e78-b5a1-6122e37d8838&context=wx). The interface is divided into two main sections: 'Build' and 'Agent preview'.

**Build Section:**

- Setup:** Includes fields for Framework (LangGraph) and Architecture (ReAct).
- Configuration:** Includes a section for Instructions with a text area containing: "you are an expert nutritionist. take the details from user about age, gender, current height and weight, typical daily schedule, medical conditions, injuries, average sleeping hours, primary objective, How often do you currently exercise per week, and for how long each session? What types of physical activities do you usually engage in (e.g., walking, yoga, weight training)? Do you have any specific health conditions or allergies?" and a button for 'Advanced configuration'.
- Knowledge:** A section for adding knowledge.
- Tools:** Includes buttons for 'Add a tool' and 'Create custom tool'.
- Added tools (1):** Lists 'Google search' with the description 'Retrieve information from the internet with the Google search engine.'

**Agent preview Section:**

- User:** 06:23 PM. Message: "21, male, height 164 cm, weight 72kg, 8 sitting hours, headache and body pain, 3 sleeping hours, reduce body weight by 3 kg, no physical activity, 7 meals a day, 3 litres of water per day. give me the diet plan and suitable exercises for losing weight and recovering headache."
- watsonx Agent:** 06:23 PM. Response: "Based on the information you provided, I'll create a personalized diet plan and exercise routine to help you achieve your goals."  
**Diet Plan:**  
To lose 3 kg, you'll need to create a calorie deficit of around 500-750 calories per day through a combination of diet and exercise. Here's a sample diet plan for you:  
  1. **Breakfast:** Oatmeal with fruits and nuts (300 calories)
  2. **Mid-Morning Snack:** Fresh fruits and yogurt (150 calories)
  3. **Lunch:** Grilled chicken breast with brown rice and vegetables (400 calories)
  4. **Evening Snack:** Carrot sticks with hummus (100 calories)
  5. **Dinner:** Grilled fish with quinoa and steamed vegetables (500 calories)
  6. **Before Bed Snack:** Cucumber slices with low-fat milk (100 calories)**Total Calories:** 1650 calories  
**Macro-Nutrient Breakdown:**
  - Protein: 120g
  - Fat: 40g
  - Carbohydrates: 200g**Tips:**
  - Drink at least 3 liters of water per day
  - Eat 5-6 meals per day to keep your metabolism boosted
  - Avoid sugary drinks and foods high in sugar
  - Incorporate healthy fats like nuts, seeds, and avocado into your diet
  - Choose whole grains over refined grains**Exercise Routine:**  
To help you lose weight and alleviate headache and body pain, I recommend the following exercise routine:  
  1. **Brisk Walking:** 30 minutes, 3 times a week
  2. **Bodyweight Exercises:** 2 times a week
    - Squats: 3 sets of 10 reps
    - Push-ups: 3 sets of 10 reps
    - Lunges: 3 sets of 10 reps (on each leg)

---

# CONCLUSION

- Fitness Buddy offers smart, accessible, and personalized health & fitness coaching.
- Utilizes IBM Cloud Lite and IBM Granite models for AI-driven, human-like interaction.
- Provides tailored workouts, meal suggestions, and daily motivation via chat.
- Built with serverless architecture for scalability and cost-efficiency.
- Delivers real-time, 24/7 availability through a user-friendly conversational interface.
- Demonstrates the power of cloud-based AI in promoting daily wellness and healthy habits.

# FUTURE SCOPE

- In the future, Fitness Buddy can be enhanced by integrating with wearable devices like smartwatches and fitness bands to provide real-time health and activity tracking.
- Voice assistant compatibility can enable hands-free interactions, making the solution even more accessible.
- The system can be further personalized through advanced AI models.
- Expanding the assistant to support multiple languages using IBM Granite's multilingual capabilities will broaden its reach.
- AI-generated progress reports can give users insightful feedback and help them track long-term health goals effectively.

# REFERENCES

- IBM Cloud Documentation – <https://cloud.ibm.com/docs>
- IBM Watson Assistant – <https://www.ibm.com/cloud/watson-assistant>
- IBM Granite Models – <https://research.ibm.com/blog/ibm-granite-models>
- IBM Cloud Functions – <https://www.ibm.com/cloud/functions>
- IBM Cloud Object Storage – <https://www.ibm.com/cloud/object-storage>
- World Health Organization – Physical Activity Guidelines – <https://www.who.int>
- Harvard Health Publishing – Fitness and Nutrition Resources – <https://www.health.harvard.edu>

# IBM CERTIFICATIONS

In recognition of the commitment to achieve  
professional excellence



## Dinesh Kumar Yadav

Has successfully satisfied the requirements for:

### Getting Started with Artificial Intelligence



Issued on: Jul 16, 2025  
Issued by: IBM SkillsBuild

Verify: <https://www.credly.com/badges/31f554a5-5180-4f61-bc84-47d4bc079015>



# IBM CERTIFICATIONS

In recognition of the commitment to achieve  
professional excellence



## Dinesh Kumar Yadav

Has successfully satisfied the requirements for:

---

### Journey to Cloud: Envisioning Your Solution

---



Issued on: Jul 18, 2025  
Issued by: IBM SkillsBuild

Verify: <https://www.credly.com/badges/e6048a41-53c3-45ee-b002-3cf1f6376552>



# IBM CERTIFICATIONS

IBM **SkillsBuild**

Completion Certificate



This certificate is presented to  
**Dinesh Kumar Yadav**

for the completion of  
**Lab: Retrieval Augmented Generation with  
LangChain**

(ALM-COURSE\_3824998)

According to the Adobe Learning Manager system of record

**Completion date:** 26 Jul 2025 (GMT)

**Learning hours:** 20 mins



**THANK YOU**