
CAPSTONE PROJECT

FITNESS BUDDY

Presented By:

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OUTLINE

- **Problem Statement** (Should not include solution)
- **Proposed System/Solution**
- **System Development Approach** (Technology Used)
- **Algorithm & Deployment**
- **Result (Output Image)**
- **Conclusion**
- **Future Scope**
- **References**

PROBLEM STATEMENT

In today's fast-paced lifestyle, many individuals find it challenging to stay healthy due to limited time, lack of motivation, and absence of personalized fitness support. Traditional fitness solutions often come with high costs, rigid routines, or one-size-fits-all plans that don't adapt to personal preferences. The crucial challenge lies in delivering consistent, personalized, and affordable fitness and nutrition guidance that seamlessly fits into diverse lifestyles without requiring specialized equipment or gym access. This creates a strong need for a smart, accessible, and flexible alternative.

PROPOSED SOLUTION

- **The proposed system aims to solve the challenge of delivering affordable, personalized, and on-demand fitness and wellness guidance by leveraging AI. Using IBM Watsonx.ai and the Granite model, the solution acts as a conversational virtual assistant that adapts to each user's goals, preferences, and lifestyle. The solution consists of the following components:**
 - **1. Watsonx.ai Agent Setup:** Developed using Agent Lab within IBM Watsonx.ai.
Integrated IBM's **granite-8b-instruct model** for natural language understanding and response generation.
 - **2. Instruction-Driven Design:** Custom instruction guide the assistant's behavior. The core instructions given to the agent include:
Role definition: Fitness Buddy, an AI-powered virtual assistant.
Response tone: Supportive, motivating, and accessible.
Personalization: Tailors advice based on fitness goal, level, workout type, available time, dietary preferences, and lifestyle.
Responsiveness: If any key info is missing, the assistant prompts the user gently.
 - **3. Chat-Based User Interaction:** Conversations begin by collecting preferences conversationally.
Responses are generated in real time, based entirely on user input and provided context.
 - **4. Tested on Watsonx.ai Agent:** The assistant was deployed and tested using the built-in testing environment.
Input messages were passed as user role, and output was validated against instruction behavior.
 - **5. Output:** The assistant successfully provided: Custom workout plans, Simple and healthy meal suggestions, Motivation and daily tips, Habit-building encouragement.
All responses were aligned with the instruction and adapted to the user's scenario without requiring rigid plans or expensive equipment.
 - **6. Result:** The AI-powered Fitness Buddy demonstrated: Natural, human-like conversation flow, Real-time adaptability to individual preferences, Elimination of the need for costly or static fitness solutions, Scalability as a virtual health coach accessible anytime, anywhere

SYSTEM APPROACH

The "System Approach" section outlines the overall strategy and methodology for developing and implementing the Fitness Buddy AI assistant. Here's a suggested structure for this section:

- **System requirements: Hardware Requirements:**
 - A computer or laptop with a minimum of 4GB RAM and i3 processor or above
 - Stable internet connectivity for accessing IBM Cloud services
- **Library required to build the model: Software Requirements:**
 - Internet browser (e.g Google Chrome)
 - IBM Cloud Lite Account
 - IBM Watsonx.ai Studio with Granite LLM
 - IBM Cloud object Storage.
 - IBM Granite Foundation Model (granite-3-3-8b-instruct) integrated within Watsonx.ai Agent Lab

ALGORITHM & DEPLOYMENT

- In the Algorithm section, The Fitness Buddy system uses IBM's Watsonx.ai foundation model **granite-3-3-8b-instruct** to simulate a conversational fitness assistant.
- **Algorithm: (Granite-8b-Instruct)**
- **Instruction Setup:** Agent primed to act as a friendly fitness coach.
- **User Inputs:** Collects data on goals, fitness level, available time, workout type, diet, and lifestyle.
- **Response Generation:** Model provides tailored:
 - Home workout routines
 - Meal suggestions
 - Motivation tips
 - Habit-building advice
- **Conversational Flow:** Adaptive follow-ups for clarity and personalization.
- **Deployment:**
- **Platform:** IBM Watsonx.ai Agent Lab
- **Model used:** granite-8b-instruct foundational model
- **Steps:** 1. Create project in Watsonx.ai (Lite plan)
 2. Set up agent in Agent Lab
 3. Choose Granite model
 4. Define instructions and behaviour
 5. Interact and refine responses

RESULT

Agent Lab (beta) — Docs | IBM

Agent Lab — FitnessBuddy_AI

dataplatform.cloud.ibm.com/wx/agents?context=wx&project_id=c1f49d82-afc3-4b11-9a60-8fa64d3dbf7b

IBM watsonx

Upgrade

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Projects / FitnessBuddy_AI / Agent Lab

Share feedback

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Unsaved

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New agent

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Deploy

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Build

AI

Model: granite-3-3-8b-instruct

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Configuration

⌵

Framework

LangGraph

▼

Architecture

ReAct

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Instructions

⌵

Dietary preference and any restrictions

Lifestyle context (e.g., student, desk job, active)

Use this information to give smart, personalized responses. If anything is missing, ask conversationally before offering advice. Stay accessible, positive, and avoid suggesting expensive equipment or rigid plans.

Advanced configuration

Knowledge

⌵

Tools

⌵

Add a tool

Create custom tool

Added tools (5)

Google search

⚙️

🗑️

Retrieve information from the internet with the Google search engine.

DuckDuckGo search

🗑️

Retrieve information from the internet with the DuckDuckGo search engine.

Agent preview

current fitness level, preferred workout type, available time, dietary preferences, and any lifestyle context that might be helpful?

▶ How did I get this answer?

DS

You: 01:24 PM

I want to lose weight, I'm a beginner, prefer home workouts with no equipment, and I have around 20 minutes daily. I'm vegetarian and work from home.

👤

watsonx Agent 01:24 PM

Great! It's wonderful to hear that you're taking steps towards your weight loss goal. As a beginner with limited time, I suggest we focus on high-intensity interval training (HIIT) workouts, which are efficient and can be done at home without any equipment. Here's a simple 20-minute HIIT workout you can start with:

1. Warm-up (3 minutes):

Jumping jacks or jogging in place to get your heart rate up.

2. High-Intensity Interval (4 minutes):

• Squats: 30 seconds of squats followed by 30 seconds of rest. Repeat this cycle.

• Push-ups (modified if needed): If standard push-ups are too challenging, you can start with wall push-ups or knee push-ups. Do them for 30 seconds, rest for 30 seconds, and repeat.

• Plank: Hold a plank position for 30 seconds with a 30-second rest.

3. Cool Down (3 minutes):

Stretching to help your muscles recover and avoid injury.

Remember, it's important to listen to your body and adjust the intensity as needed. As a vegetarian, ensure you're getting enough protein in your diet to support muscle recovery and weight loss.

For meal ideas, I can look up some healthy, vegetarian recipes if you'd like. Also, since you work from a home office, I can suggest some tips to incorporate more movement into your daily routine. Just let me know!

▶ How did I get this answer?

Type something...

🗨️

▶

RESULT

Agent Lab (beta) — Docs | IBM

watsonx Agent — FitnessBuddy

watsonx Agent — FitnessBuddy

watsonx Agent — FitnessBuddy

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dataplatfom.cloud.ibm.com/wx/agents/06c98abb-fecc-422d-8584-c759229?project_id=c1f49d82-afc3-4b11-9a60-8fa64d3dbf7b&context=wx

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IBM watsonx

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Projects / FitnessBuddy_AI / watsonx Agent

Share feedback ⓘ Autosaved 2:05 PM 📅 ▼ New agent + Deploy 🔗 🔒 ⓘ

Build

AI Model: granite-3-3-8b-instruct × <

Setup Configuration Framework Architecture LangGraph ReAct Instructions Advanced configuration Knowledge Tools Add a tool Create custom tool Added tools (5) Google search DuckDuckGo search Wikipedia search Webcrawler

Model parameters

You can edit parameters only when the conversation has been cleared in chat mode. Clear chat

Frequency penalty Presence penalty Temperature Top P (nucleus sampling) Max tokens Random seed Stop sequences

Agent preview

How did I get this answer?

DS You: 02:05 PM My goal is to build muscle. I'm at an intermediate fitness level and can train 30–40 minutes a day. I prefer strength training at home with some dumbbells. I eat non-veg.

watsonx Agent 02:05 PM That's fantastic! Strength training is an excellent way to build muscle, and with your intermediate fitness level and dedicated 30-40 minutes a day, you're in a great position to see progress. Here's a sample workout plan you can do at home with dumbbells:

Warm-up (5 minutes): Start with a light jog in place or jumping jacks to get your heart rate up. Follow this with some dynamic stretches like arm circles, leg swings, torso twists, and lunges with twists to prepare your muscles for the workout.

Strength Training (25-30 minutes):

1. Squats (3 sets of 10-12 reps): Hold a dumbbell in each hand at shoulder level with your hands facing each other. Squat down as if you're sitting in a chair, keeping your knees behind your toes. Push through your heels to return to the starting position.

2. Dumbbell Deadlifts (3 sets of 10-12 reps): Stand on a dumbbell with one foot, keeping your back straight. Bend at the hips, lower your torso, and grab the dumbbell on the floor with the other hand. Keeping your back flat, lift the dumbbell off the floor, driving through your heels. Place it back on the floor, then switch feet and repeat.

3. Dumbbell Bench Press (3 sets of 10-12 reps): Lie on a bench or the floor, hold a dumbbell in each hand at chest level. Lower the dumbbells to your chest, then push them back up.

4. Dumbbell Rows (3 sets of 10-12 reps each side): Bend at your waist, keeping your back straight. Let your arms hang down with a dumbbell in each hand. Pull the dumbbells up to your sides, keeping your elbows close to your body, then lower them back down.

5. Overhead Press (3 sets of 10-12 reps): Stand with your feet shoulder-width apart, hold a dumbbell in each hand at shoulder height, palms facing each other. Press the dumbbells straight up until your arms are almost fully extended, then lower them back down.

Cool Down (5 minutes): Finish your workout with some static stretches to help your muscles recover. Hold each stretch for 15-30 seconds.

Type something...

RESULT

The screenshot displays a web browser window with multiple tabs open, including 'Agent Lab (beta) — Docs | IBM' and 'watsonx Agent — FitnessBuddy'. The active tab shows the deployment page for 'watsonx Agent' on the URL 'dataplatfom.cloud.ibm.com/ml-runtime/deployments/f71226f2-af0b-4d93-a15f-19127e8c5ba'. A browser extension notification for 'watsonx Agent — FitnessBuddy_Deploy | IBM watsonx' is visible, showing 'Memory usage: 168 MB'. The page header includes 'IBM watsonx' and navigation links for 'Deployment spaces', 'FitnessBuddy_Deploy', and 'watsonx Agent'. The main content area shows the 'watsonx Agent' deployment is 'Deployed' and 'Online'. The 'Test' tab is selected, displaying the 'Enter input data' section. The 'JSON' input format is chosen, and a text area contains the following JSON input:

```
{
  "messages": [
    {
      "content": "I want to lose weight. I'm a beginner and prefer home workouts. I have 30 minutes daily and I'm vegetarian. I also work from home.",
      "role": "user"
    }
  ]
}
```

Below the text area is a blue 'Predict' button. The page also includes links for 'API reference', 'Test', and 'Preview'.

RESULT

Agent Lab (beta) — Docs | IBM

watsonx Agent — FitnessBuddy

watsonx Agent — FitnessBuddy

watsonx Agent — FitnessBuddy

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dataplatform.cloud.ibm.com/ml-runtime/deployments/f71226f2-af0b-4d93-a15f-19127e8c5bad/test?space_id=e98931fe-a9d4-42ea-96f9-68c14bc5c514&context=wx&flush=t...

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Deployment spaces / FitnessBuddy_Deploy / watsonx Agent /

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Prediction results

×

Display format for prediction results

☐ Table view ☒ JSON view

☐ Show input data ⓘ

JSON view

```
{  "choices": [    {      "index": 0,      "message": {        "content": "That's fantastic! Building muscle is a great goal, and with your intermediate fitness level and dedicated time slot, you're well-positioned for success. Here's a simple, home-based strength training plan you can follow using dumbbells:\n\n**Warm-up (5 minutes):**\nStart with a light jog in place or jumping jacks to get your heart rate up. Follow this with some dynamic stretches like arm circles, leg swings, and torso twists to prepare your muscles for the workout.\n\n**Workout (25-30 minutes):**\n\n1. **Squats (3 sets of 12 reps):** Stand with your feet hip-width apart, hold a dumbbell in each hand at shoulder level. Sit back as if you're sitting into a chair, keeping your back straight. Push through your heels to return to standing.\n\n2. **Dumbbell Bench Press (3 sets of 12 reps):** Lie on a bench or the floor, hold a dumbbell in each hand at chest level. Lower the weights to your chest, then push up to the starting position.\n\n3. **Dumbbell Rows (3 sets of 12 reps each side):** Stand with your feet shoulder-width apart, bend at the waist, and hold a dumbbell in each hand. Pull the weights towards your body until your elbows are at about 90 degrees.\n\n4. **Overhead Press (3 sets of 12 reps):** Stand with your feet shoulder-width apart, hold a dumbbell in each hand at shoulder height, with your palms facing forward. Press the weights straight up until your arms are almost fully extended.\n\n5. **Dumbbell Lunges (3 sets of 10 reps each leg):** Hold a dumbbell in each hand, step forward with one leg into a lunge position, ensuring your front knee is at a 90-degree angle. Push back up to standing and repeat with the other leg.\n\n6. **Bicep Curls (3 sets of 12 reps):** Stand with your feet hip-width apart, hold a dumbbell in each hand with your palms facing forward. Curl the weights up towards your shoulders, then lower them back down.\n\n7. **Tricep Extensions (3 sets of 12 reps):** Stand with your feet hip-width apart, hold a dumbbell in one hand, bring the dumbbell above your head, bend your elbow, and lower the weight behind your head. Push the weight back up to the starting position.\n\nRemember to keep your form correct and control the weights during each movement. As you get stronger, you can increase the weight of your dumbbells.\n\n**Cool Down (5-10 minutes):**\nFinish your workout with some static stretches to help your muscles recover and grow.\n\nAs for your diet, since you prefer non-veg, ensure you're getting enough protein to support muscle growth. Foods like chicken, turkey, fish, eggs, and Greek yogurt are excellent sources. Don't forget to include complex carbs and healthy fats for sustained energy.\n\nStay consistent, and remember that progress takes time. Keep me updated on how you're feeling and any challenges you're facing. I'm here to support you on your muscle-building journey!",        "role": "assistant"      }    ]  }
```

Download JSON file

edunet

foundation

CONCLUSION

- **Fitness Buddy** is a conversational AI assistant built using IBM Watsonx.ai service and the **Granite-8b-instruct** model to deliver **personalized fitness, nutrition, and motivation support**.
- It tailors responses based on user inputs like fitness goals, level, available time, and lifestyle—ensuring relevant and accessible guidance.
- **Challenges** included ensuring contextual consistency without external data sources and designing a natural, chat-based interaction.
- **Future improvements** may include user session memory and integration into a mobile/web app for enhanced usability.
- This solution highlights the potential of AI in delivering smart, on-demand wellness support in today's fast-paced world.

FUTURE SCOPE

- **Personalized Experiences:** Implement user memory to retain fitness goals, history, and progress for tailored coaching.
- **Multilingual Reach:** Support regional languages to enhance accessibility across diverse user groups.
- **Platform Expansion:** Launch as a web/mobile app with push notifications and integrated progress tracking.
- **Wearable Syncing:** Integrate with smartwatches and fitness bands for real-time data-driven recommendations.
- **AI Enhancement:** Adopt advanced models (e.g., fine-tuned transformers, RAG) for more natural, contextual conversations.
- **Edge Computing:** Enable offline or low-latency responses in remote or limited-connectivity environments.

REFERENCES

- **IBM Watsonx.ai Documentation:** (Used for understanding and deploying foundation models on IBM Cloud).

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Completion Certificate



This certificate is presented to

Divya Sharma

for the completion of

**Lab: Retrieval Augmented Generation with
LangChain**

(ALM-COURSE_3824998)

According to the Adobe Learning Manager system of record

Completion date: 23 Jul 2025 (GMT)

Learning hours: 20 mins

THANK YOU

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