
CAPSTONE PROJECT

FITNESS BUDDY

Presented By:

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OUTLINE

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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 ondemand fitness advice, healthy lifestyle suggestions, and basic nutrition guidance—all tailored to individual needs and available at any time.

PROPOSED SOLUTION

The proposed system, Fitness Buddy, aims to address the challenge of promoting consistent health habits and personalized lifestyle support by using IBM's AI-powered capabilities. Rather than using a complex machine learning pipeline, this solution leverages IBM watsonx.ai's Agentic AI to act as an intelligent virtual fitness coach.

It provides:

- Personalized home workout recommendations based on user inputs
- Motivational tips and fitness encouragement
- Healthy and simple meal suggestions
- Habit-building support for long-term consistency

The assistant is built on a lightweight, cost-efficient IBM Cloud Lite setup, eliminating the need for external datasets or high computational resources. The agent utilizes a curated text-based knowledge file and foundational AI model configuration to personalize user experience. The response flow is designed entirely around prompt-based reasoning, enabling fast, scalable deployment without traditional model training.

Interaction is conversational and friendly, offering dynamic help based on real-time inputs. The assistant asks for user name, goal, age, fitness level, and then tailors advice accordingly. This solution uses minimal infrastructure while demonstrating a real-world, conversational AI implementation using only IBM Cloud tools.

SYSTEM APPROACH

- Platform: IBM watsonx.ai (Agentic AI interface)
- Cloud Plan: IBM Cloud Lite
- Foundation Model: granite-3-3-8b-instruct
- Knowledge Integration: Custom knowledge base (e.g., Dietary guidelines for Indians- pdf from Ministry of Health,India)

Development Flow:

- Intent Design: Define key user intents—workout help, meal ideas, motivation, habit support.
- Prompt Engineering: Craft a custom system prompt to handle initial greeting, service selection, info collection, and personalized response.
- Model Selection: Use granite-3-3-8b-instruct model with low token limits (512 tokens max) and temperature 0.4 to balance creativity and cost-efficiency.
- Knowledge Base Upload: Upload curated fitness-related .txt file (exercise plans, meal samples, FAQs) as a vector index.
- Response Testing: Validate agent output using sample user flows to confirm accurate task handling.
- Deployment: Keep deployment lightweight—only cloud-native, no additional integrations or UI layers.

Efficiency Configuration:

- Temperature: 0.4
- Max Tokens: 500
- Frequency & Presence Penalty: 0
- Quick-start questions added for smoother onboarding

ALGORITHM & DEPLOYMENT

The system does not rely on a traditional ML algorithm. Instead, it uses instruction-following generative AI from IBM's Granite family to respond to user inputs. The "algorithm" is a series of prompt-engineered flows that guide the agent's reasoning and decision-making. The model interprets intent, extracts contextual data (age, fitness level, health concerns), and reasons over a vector knowledge base.

Steps Followed:

- User greets the agent.
- Agent requests name and offers a list of services (workout, motivation, meals, habits).
- Based on user choice, the agent asks for age, fitness level, and any health-related flags.
- The model uses this context to generate a personalized response.
- If relevant, it fetches text snippets from the knowledge base to supplement the response.
- Ends with a follow-up like "Would you like help with anything else?"

Deployment Process:

- Designed entirely inside IBM watsonx.ai Agent Builder
- Knowledge base indexed from .txt file using vector index tool
- No backend coding or API integration needed
- Model run settings configured to reduce resource usage (Lite-friendly)
- Agent is tested directly within the IBM interface for performance and reliability

RESULT

Ground gen AI with vectorized documents

Add documents to vectorize and create a vector index in memory. Otherwise, select your vector database and specify index details.

The screenshot shows the 'Add files' and 'Define details' sections of the IBM Watsonx interface. On the left, under 'Vector stores', 'In memory' is selected. The 'Add files' section has a 'Drop data files or browse to upload' area with instructions and file size limits, and a 'Browse' button. Below it, a file 'DietaryGuidelinesForIndians.pdf' (41.9MB) is listed. The 'Define details' section has a 'Name' field with 'DietaryGuidelinesForIndians' and a 'Description (optional)' field with 'Complete dietary guidance for Indians issued by the National Institute Of Nutrition ,India'. There are 'Cancel' and 'Create' buttons at the bottom right.

custom knowledge base

The screenshot shows the 'Build' and 'Agent preview' sections of the IBM Watsonx interface. The 'Build' section on the left has a 'Configuration' tab with 'LangGraph' selected for the framework and 'ReAct' for the architecture. The 'Instructions' field contains: 'You are Fitness Buddy, an AI assistant. Greet users with "Hi, I am Fitness Buddy. How can I help you?" Then ask for the user's name and greet them. Next, offer the following services: - Recommend home workouts and routines - Provide motivational tips and daily fitness inspiration'. The 'Knowledge' section is empty. The 'Tools' section has 'Add a tool' and 'Create custom tool' buttons. Below, 'Added tools (6)' includes 'Google search' with the description 'Retrieve information from the Internet with the Google search engine.' The 'Agent preview' section on the right shows a 'Welcome to FitnessBuddy' message and a list of 'Sample questions' with input fields and arrows: 'What's a good beginner home workout for today?', 'What healthy meal can I try today?', 'How can I build a daily fitness habit?', and 'Can you give me some motivation to stay consistent?'. At the bottom is a text input field 'Type something...'.

Instructions for the Agent

RESULT

Upgrade ⓘ 🔔 Navaneeth Sekhar's Account ▾ Dallas ▾

Share feedback ⓘ Autosaved 4:09 PM 📄 ▾ New agent + Deploy 🔒

< Agent preview

🗨️ FitnessBuddy 04:09 PM

Hi, I am Fitness Buddy. How can I help you today? May I know your name? And before we start, would you like assistance with:

1. Recommendations for home workouts and routines?

2. Motivational tips and daily fitness inspiration?

3. Suggestions for simple, nutritious meal ideas?

4. Encouragement for habit-building and consistency?

Please let me know how I can best support your fitness journey!

▶ How did I get this answer?

NS You: 04:10 PM

I'm Navaneeth, suggest me meal ideas

🗨️ FitnessBuddy 04:10 PM

Hi Navaneeth, it's great to meet you! I'd be happy to suggest some simple, nutritious meal ideas for you. To tailor these suggestions to your needs, could you please tell me a bit more about yourself? Specifically, I need to know your age, current fitness level, and if you have any health concerns I should be aware of.

Once I have this information, I can provide you with personalized meal recommendations. Would you also like help with anything else, such as workout routines or motivation tips?

▶ How did I get this answer?

🗨️

Type something...

1

Agent preview

NS You: 04:11 PM

I'm 20 years old, physically active and no health concerns

🗨️ FitnessBuddy 04:11 PM

Hello Navaneeth, it's great to hear that you're 20, physically active, and in good health! Based on your lifestyle, here are a few meal ideas to fuel your active days:

1. **Breakfast:** Greek yogurt with mixed berries and a sprinkle of granola. You could also try an omelet with spinach, tomatoes, and a slice of whole-grain toast.

2. **Lunch:** A quinoa salad with grilled chicken, mixed veggies, and a lemon-olive oil dressing. Alternatively, a turkey and avocado wrap with a side of carrot sticks could work well too.

3. **Dinner:** Baked salmon with a side of brown rice and steamed broccoli. Or, a vegetable stir-fry with tofu and mixed vegetables over quinoa.

4. **Snacks:** A handful of almonds, an apple with peanut butter, or some hummus with cucumber slices.

Remember, staying hydrated is also crucial, so keep water intake high throughout the day.

Would you like more meal ideas, or assistance with workout routines or motivation tips? I'm here to support you in any way I can, Navaneeth!

▶ How did I get this answer?

🗨️

Type something...

2

Agent preview

NS You: 04:11 PM

recommend home workout plan

🗨️ FitnessBuddy 04:11 PM

Hi Navaneeth, great choice! Since you're 20, physically active, and in good health, here's a simple home workout plan you can follow:

Day 1: Full Body Strength Training

1. Push-ups: 3 sets of 10-15 reps

2. Squats: 3 sets of 15-20 reps

3. Lunges: 3 sets of 10 reps per leg

4. Planks: Hold for 30 seconds to 1 minute (repeat 3 times)

5. Bent-over rows (using a resistance band or a bottle of water): 3 sets of 10-15 reps

Day 2: Cardio

• A 30-minute high-intensity interval training (HIIT) session. For example, sprint in place for 30 seconds, then rest for 30 seconds. Repeat for 15 minutes. Finish with a 10-minute brisk walk in place or around your home if possible.

Day 3: Rest or Light Activity

• Consider a leisurely walk or gentle yoga to promote recovery.

Day 4: Full Body Strength Training Repeat Day 1 routine.

🗨️

Type something...

3

working example of the Agent

CONCLUSION

- The Fitness Buddy project successfully demonstrates how IBM's Agentic AI platform can be leveraged to build a lightweight, intelligent virtual assistant without requiring traditional machine learning pipelines or complex infrastructure. By using prompt engineering, a carefully curated knowledge base, and optimized model configurations, the solution provides meaningful fitness guidance, motivation, healthy meal ideas, and habit-building suggestions in a fully conversational format.

FUTURE SCOPE

- Multi-modal capabilities: Expand the assistant to accept voice input or visual fitness tracking via image uploads.
- Mobile/Web UI integration: Add a user interface layer (using Watson Web Chat, Flutter, or React) for broader access.
- User data persistence: Integrate IBM Cloudant or object storage to track and personalize user goals and progress over time.
- Notification system: Implement daily reminders for workouts, water intake, or motivational nudges using IBM Functions or App Connect.
- Broader domain coverage: Add sleep guidance, stress management, and mental wellness support through additional knowledge files.
- Scalability: Transition from Lite to paid IBM Cloud plan for higher resource limits and larger model use (e.g., Granite Chat v2 or LLaMA-3 for more advanced interaction).
- Multi-language support: Integrate multilingual prompts to support users in regional languages.

REFERENCES

- IBM watsonx.ai Documentation
- IBM Agentic AI – Foundation Models
- IBM Cloud Lite Plan Documentation
- National Institute of Nutrition, India – Dietary Guidelines for Indians
- Custom Fitness Knowledge Base (Manually curated file containing beginner workouts, motivational quotes, healthy meal examples, and FAQs used for agent reasoning.)

IBM CERTIFICATIONS

In recognition of the commitment to achieve professional excellence



Navaneeth Sekhar

Has successfully satisfied the requirements for:

Getting Started with Artificial Intelligence



Issued on: Jul 17, 2025
Issued by: IBM SkillsBuild

Verify: <https://www.credly.com/badges/284403de-6764-4e7c-a517-dae876b2a835>



- Screenshot/ credly certificate(getting started with AI)

IBM CERTIFICATIONS

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Navaneeth Sekhar

Has successfully satisfied the requirements for:

Journey to Cloud: Envisioning Your Solution



Issued on: Jul 20, 2025
Issued by: IBM SkillsBuild

Verify: <https://www.credly.com/badges/3617be71-6782-4804-83b7-4037f262bad5>



- Screenshot/ credly certificate(Journey to Cloud)

IBM CERTIFICATIONS

IBM **SkillsBuild**

Completion Certificate



This certificate is presented to
Navaneeth Sekhar

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

- Screenshot/ credly certificate(RAG Lab)



THANK YOU