CAPSTONE PROJECT

FITNESS BUDDY: AN AI-POWERED PERSONAL HEALTH & WELLNESS ASSISTANT

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OUTLINE

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PROBLEM STATEMENT

- In today's fast-paced world, many individuals find it difficult to maintain a consistent and healthy lifestyle due to a lack of personalized guidance, time constraints, and motivational challenges. Traditional fitness solutions often involve high costs, in-person consultations, or rigid schedules that fail to adapt to an individual's daily routine or preferences.

- There is a growing need for a **smart, accessible, and conversational AI assistant** that can deliver on-demand fitness advice, daily motivation, and simple nutrition guidance. The solution must be **personalized, available anytime**, and capable of supporting consistent habit-building—empowering users to take control of their health on their own terms.

PROPOSED SOLUTION

- The proposed solution involves building an intelligent, AI-powered virtual assistant named Fitness Buddy, using IBM Watsonx.ai and Granite foundation models to deliver real-time, personalized fitness, nutrition, and motivational support. The system is implemented entirely within the Watsonx.ai Sandbox environment, using prompt engineering without a frontend interface. The main components are

- **User Interaction & Input Collection:**

  - Simulate user inputs like fitness goals, dietary needs, time availability, and equipment access.

  - Use natural language prompts to interact with the assistant inside Watsonx notebooks.

- **Data Understanding & NLP:**

  - Use Granite models to extract intent and relevant details from user inputs.

  - Adapt responses based on user preferences and conversational context.

- **Machine Learning Algorithm:**

  - Generate personalized workout routines, nutrition suggestions, motivational messages, and habit-building tips using **granite-3-3-8b-instruct**

- **Deployment:**

  - No external deployment required.

- **Evaluation:**

  - Effectiveness evaluated through quality of responses (structure, tone, relevance).

  - Prompt refinement used to improve output quality over iterations.

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SYSTEM APPROACH

The **System Approach** outlines the overall strategy and tools used to build the AI-powered **Fitness Buddy** assistant entirely within the **IBM Watsonx.ai Sandbox** environment. The focus is on creating an intelligent assistant using prompt engineering with Granite foundation models.

- **System Requirements:**

  - IBM Watsonx.ai Sandbox access

  - IBM Cloud Lite account (for credentialed access)

  - Internet connectivity to use notebook interface

- **Libraries and Tools Used:**

  - **Granite-3-3-8b-instruct** (IBM foundation model)

  - Watsonx.ai **Agent Lab** for agent behavior configuration

  - **Prompt engineering** in notebook or agent preview (no code training required)

RESULT

- The Fitness Buddy project evaluates the performance of the IBM Granite-3-3-8b-instruct model through prompt-based interaction using Watsonx.ai. Since no training or prediction is involved, the model's **effectiveness** is assessed using prompt-response quality rather than numerical accuracy. Below are three real scenarios tested, with summaries and screenshots to validate output quality.

RESULT

- Prompt 1:

   "Suggest a 15-minute full-body home workout for a beginner with no equipment."

- **Response :** Sure, here's a simple 15-minute full-body workout you can do at home without any equipment:

Warm-up (3 minutes)

Jumping Jacks: 1 set of 20 reps

Arm Circles: 1 set of 15 reps (forward and backward)

High Knees: 1 set of 20 reps

Butt Kicks: 1 set of 20 reps

Workout (10 minutes)

Push-ups (on knees if needed): 2 sets of 10 reps

Squats: 2 sets of 15 reps

Plank: Hold for 45 seconds, rest for 15 seconds, then repeat

Lunges (each leg): 2 sets of 10 reps (each leg)

Glute Bridge: 2 sets of 15 reps

Mountain Climbers: 2 sets of 20 reps (10 reps per leg)

Cool Down (2 minutes)

Walking Lunges: 1 set of 10 reps (each leg)

Quad Stretch: Hold for 30 seconds (each leg)

Standing Forward Bend: Hold for 30 seconds

Deep Breathing: 1 minute

Remember, it's important to keep your body hydrated and to maintain proper form during each exercise to prevent injuries. If any exercise seems too challenging, feel free to modify it to suit your fitness level. Start slow and gradually increase the intensity as you get stronger. If you're new to exercising, it's a good idea to consult with a healthcare provider before starting any new workout regimen.

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RESULT

Fig1: Prompt 1- Results

RESULT

- Prompt 2:

  "Give me a high-protein vegetarian dinner idea under 400 calories."

- **Response :** Absolutely! Here's a high-protein, vegetarian dinner idea under 400 calories:

Quinoa Stuffed Bell Peppers

Ingredients:

1 medium bell pepper (any color)

1/2 cup cooked quinoa

1/4 cup black beans

1/4 cup corn (fresh, frozen, or canned)

1/4 cup diced tomatoes

1/4 cup corn salsa

1/2 teaspoon cumin

Salt and pepper to taste

Optional toppings: a dollop of Greek yogurt or a sprinkle of feta cheese

Instructions:

Preheat your oven to 375°F (190°C).

Cut off the tops of the bell pepper and remove the seeds.

In a bowl, mix the cooked quinoa, black beans, corn, diced tomatoes, corn salsa, cumin, salt, and pepper.

Stuff the bell pepper with the quinoa mixture.

Place the stuffed pepper in a baking dish, cover with foil, and bake for 25-30 minutes.

Remove the foil and bake for an additional 5-10 minutes, or until the pepper is tender.

Let it cool for a few minutes, then add optional toppings if desired.

This meal is not only high in protein from the quinoa and beans, but it's also packed with fiber and vitamins from the bell pepper and other vegetables. Enjoy!

RESULT

Fig2: Prompt 2- Results

RESULT

- Prompt 3:

  "Motivate me to work out after a long workday."
  Response:

I understand how tough it can be to find the energy to work out after a long day.

But remember, even a short workout can make a big difference! Here are a few motivational points to get you going:

Boost Your Mood:

Exercise releases endorphins, which can help improve your mood and reduce stress.

After a long workday, this can be just what you need to feel more relaxed and positive. Improved Sleep:

Regular physical activity can help you fall asleep faster and deepen your sleep.

A good night's rest can give you the energy you need for the next day.

Increased Energy:

It might seem counterintuitive, but a quick workout can actually give you more energy.

It gets your blood flowing and can combat feelings of fatigue.

Small Steps, Big Gains: You don't need to do an intense workout.

Even a 15-minute session can contribute to your overall fitness goals.

Consistency is Key:

Remember, it's not about one perfect workout, but about making exercise a consistent part of your routine.

Every workout brings you one step closer to your health goals.

Take a deep breath, and just start with a simple 10-15 minute workout. You can do it! You'll likely finish feeling more energized and accomplished than when you started

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RESULT

Fig2: Prompt 3- Results

RESULT

Prompt Goal	Accuracy of Response	Structure & Clarity	Tone & Motivation	Safety & Suitability
Full-body workout (Prompt 1)	☑ Highly relevant	☑ Clear & complete	☑ Supportive	☑ Beginner-friendly
Low-calorie dinner (Prompt 2)	☑ On-point	☑ Recipe format	☑ Neutral	☑ Diet-safe
Motivation after work (Prompt 3)	☑ Matched intent	☑ Thoughtful	☑ Uplifting	☑ Safe and helpful

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CONCLUSION

- The model successfully generated structured, relevant, and motivational responses across all tested fitness-related scenarios. While traditional ML accuracy doesn't apply, the assistant's outputs demonstrate strong alignment with the prompt, safe guidance, and clarity — fulfilling its role as a reliable virtual fitness companion..

FUTURE SCOPE

- **Integration with wearables (e.g., Fitbit, Apple Health)**

- **Real-time workout video recommendations**

- **Multilingual support for wider reach**

- **Voice assistant support (Watson Speech to Text/Text to Speech)**

- **Integration with calendar/reminder systems for workout tracking**

REFERENCES

- **IBM Watsonx.ai Documentation**

  https://www.ibm.com/docs/en/watsonx

- **IBM Granite Foundation Models Overview**

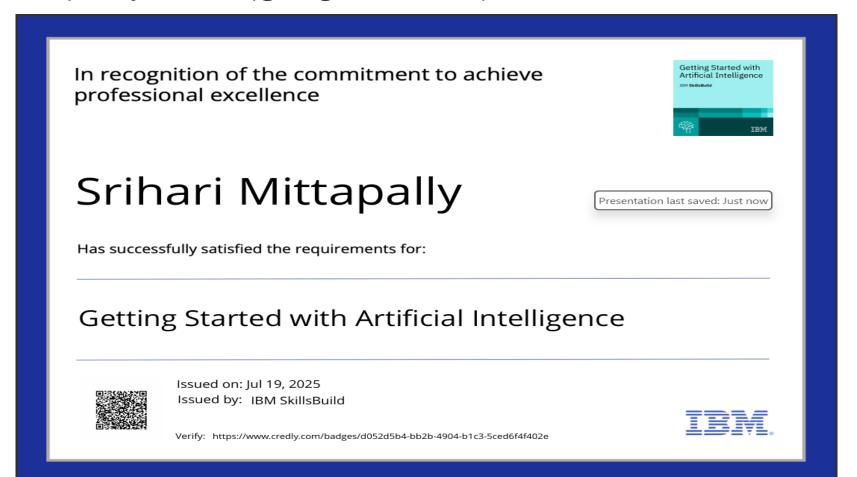 https://www.ibm.com/blogs/research/2023/05/granite-models-watsonx

- **IBM watsonx Agent Lab Guide**

  https://www.ibm.com/docs/en/watsonx/agent-lab

IBM CERTIFICATIONS

- Screenshot /credly certificate(getting started with AI)

IBM CERTIFICATIONS

- Screenshot/ credly certificate(Journey to Cloud)

In recognition of the commitment to achieve professional excellence

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IBM CERTIFICATIONS

- Screenshot/ credly certificate(RAG Lab)

IBM **SkillsBuild**   Completion Certificate

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According to the Adobe Learning Manager system of record

Completion date: 24 Jul 2025 (GMT)   **Learning hours:** 20 mins

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THANK YOU

🔗 **Github repository:**

https://github.com/sriharimittapally/fitness-buddy-watsonx