CAPSTONE PROJECT

NUTRISENSE AI – SMART NUTRITION ASSISTANT

Presented By:

1. Student Name- Shivprasad Supane
2. College Name- D Y Patil International University
   Department - CS

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OUTLINE

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PROBLEM STATEMENT

Current diet applications fail to provide personalized, adaptive, and real-time nutrition guidance, leading to poor dietary decisions and inconsistent health outcomes.

1. **Generic Plans**
Most diet apps give one-size-fits-all plans, ignoring user-specific needs.

2. **Limited Support for Conditions**
No proper dietary recommendations for diabetes, allergies, or medical cases.

3. **Lack of Real-time Analysis**
No quick insights from food labels or images to guide daily decisions.

PROPOSED SOLUTION

NutriSense AI is a Generative Agentic AI-powered assistant that:

- Understands **user input (text, voice, image)** for nutrition queries.
- Generates **personalized meal plans** based on health goals, medical history, and preferences.
- Suggests **healthier food swaps** dynamically with clear reasoning.
- Analyzes **food labels and images** to check calories, sugar, and nutrition content.
- Adapts recommendations continuously based on user feedback.

SYSTEM APPROACH

System requirements:

- **IBM Watsonx.ai Agent Lab** – for Agentic AI orchestration.
- **Granite LLM** – for natural language understanding and reasoning.
- **Watson Discovery** – for RAG-based data retrieval.
- **Cloud Object Storage** – for datasets (recipes, nutrition facts).
- **IBM Visual Recognition / Python API** – for food label image analysis.
- **Frontend:** Watson Assistant Web Chat or Streamlit app for user interaction.

ALGORITHM & DEPLOYMENT

Input Processing: Collect user dietary info (goals, allergies, preferences).

•**RAG Engine:** Retrieve relevant data from nutrition datasets and recipe sources.

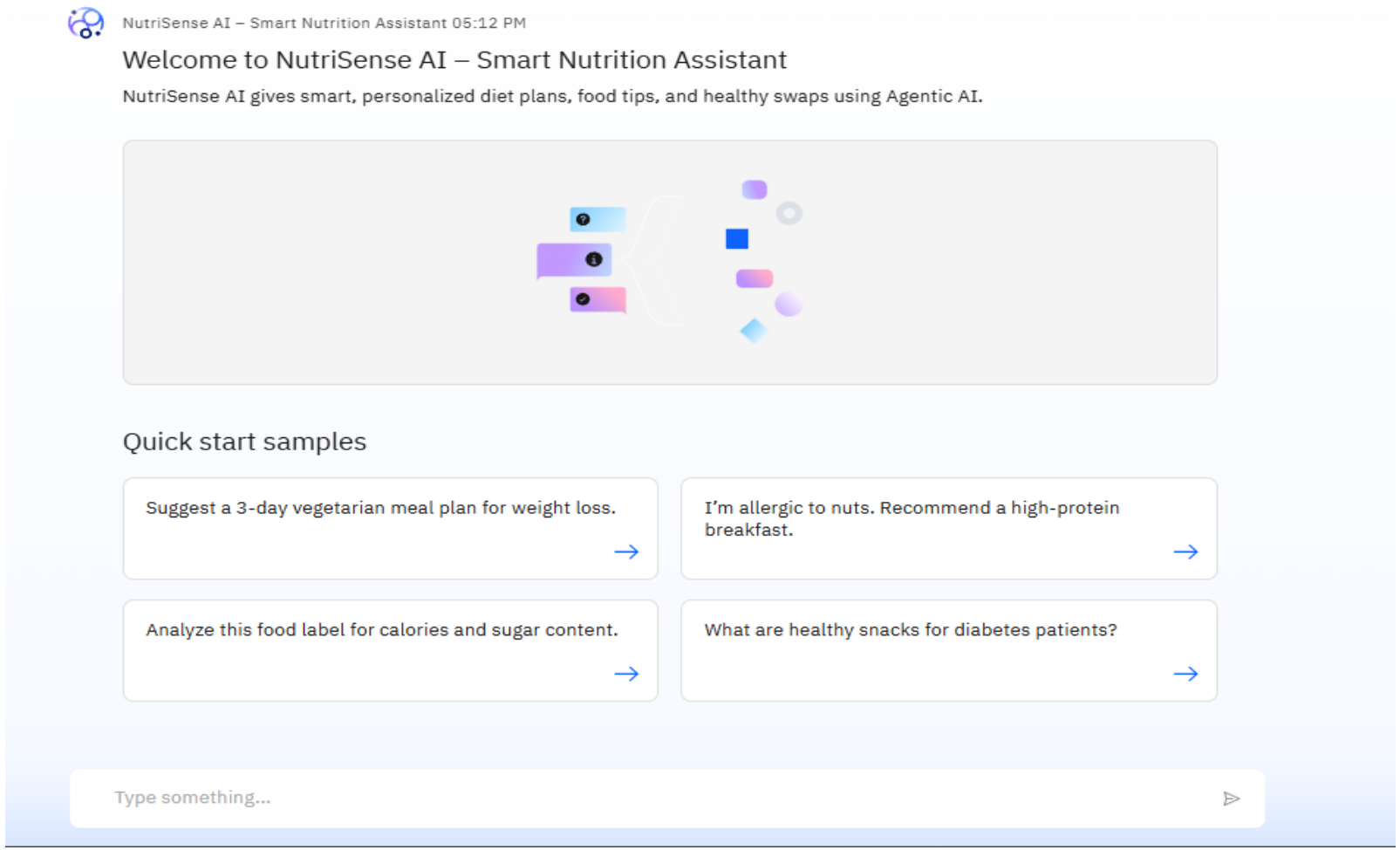
•**Reasoning with Granite LLM:** Generate meal plans and recommendations.

•**Image Analysis:** Extract nutritional info from uploaded food labels or meal photos.

•**Output:** Personalized meal plan with calorie breakdown and explanations.

•**Deployment:** Hosted on IBM Cloud Lite, accessible via chatbot/web app.

RESULT


NutriSense AI – Smart Nutrition Assistant 05:12 PM
Welcome to NutriSense AI – Smart Nutrition Assistant
NutriSense AI gives smart, personalized diet plans, food tips, and healthy swaps using Agentic AI.
Quick start samples
Suggest a 3-day vegetarian meal plan for weight loss.
I'm allergic to nuts. Recommend a high-protein breakfast.
Analyze this food label for calories and sugar content.
What are healthy snacks for diabetes patients?
Type something...

CONCLUSION

- NutriSense AI successfully demonstrates the use of **Agentic AI** for **health personalization**.
- Provides **dynamic, user-specific diet plans**, improving decision-making.
- Reduces dependency on manual nutrition counseling.
- Can be scaled to support **multilingual users, image-based recommendations, and real-time diet tracking**.

FUTURE SCOPE

- Integration with **fitness tracking devices and wearable sensors**.
- Expansion to **multi-language support** for wider reach.
- AI-powered **nutrient deficiency detection** and supplement suggestions.
- **Partnership with dieticians and health apps** for real-world deployment.

REFERENCES

- IBM Watsonx.ai Documentation
- IBM Granite Models & RAG Lab
- Open Food Facts Nutrition Dataset
- Research articles on Personalized Diet AI Systems

IBM CERTIFICATIONS

Screenshot/ credly certificate(getting started with AI)

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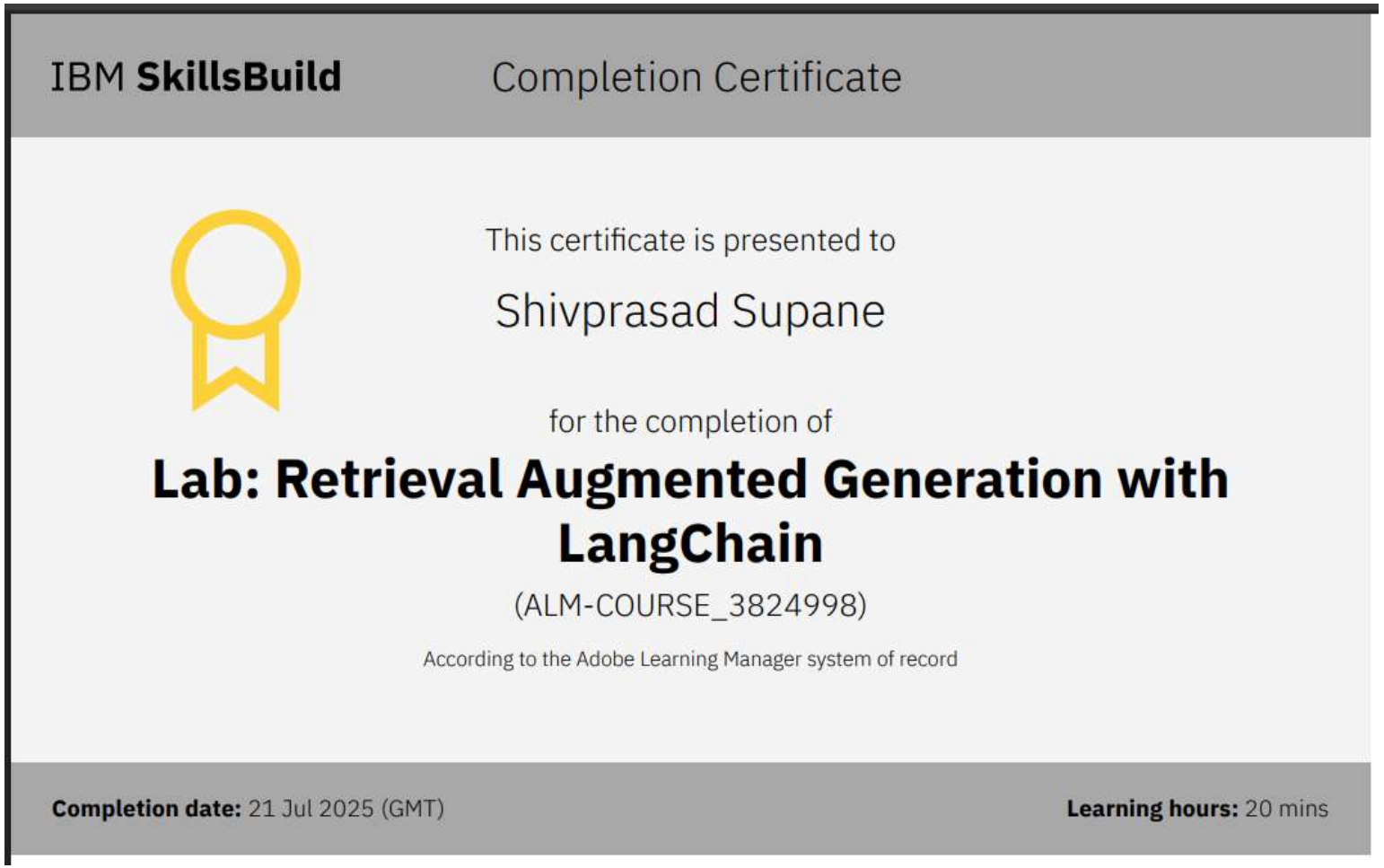
IBM CERTIFICATIONS

Screenshot/ credly certificate(Journey to Cloud)

IBM CERTIFICATIONS

Screenshot/ credly certificate(RAG Lab)



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GITHUB LINK

THANK YOU

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