

# **AGENTIC AI PROJECT**

## **RECIPE PREPARATION AGENT**

**Presented By:**

**Kothamasi Sruthi**

**Stanley College of Engineering and Technology for  
Women**

**Artificial Intelligence and Data Science**

# OUTLINE

- **Problem Statement**
- **Proposed System/Solution**
- **System Development Approach**
- **Algorithm & Deployment**
- **Result**
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# PROBLEM STATEMENT

Many people struggle to decide what to cook with the ingredients they have at home. This leads to food waste, extra shopping trips and time loss. There is a need for a smart system that can suggest recipes based on available ingredients, considering dietary needs, substitutions, and time-saving options.

# PROPOSED SOLUTION

- The proposed system aims to assist users in preparing meals using only the ingredients they have on hand. It leverages IBM watsonx.ai's Agentic AI framework and Retrieval-Augmented Generation (RAG) approach to dynamically retrieve, adapt, and generate recipes.
- The solution consists of the following components:
- **Ingredient Input Interface:** Users enter a list of available ingredients.
- **Prompt-Driven AI Agent:** A Watsonx.ai agent processes this input using a pre-defined prompt and retrieves the most relevant recipes.
- **Recipe Adaptation:** The agent modifies recipes to match the user's available ingredients and suggests substitutions for missing items.
- **Dietary Adjustment & Tips:** Based on dietary preferences (e.g., vegan, allergy info), the agent customizes the recipe output and provides useful cooking tips.
- **Deployment & Access:** The solution is deployed using IBM Watsonx.ai Runtime, allowing users to access it through a preview interface or API endpoint.
- This system helps reduce food waste, simplifies meal planning, and supports healthy, sustainable cooking using AI on IBM Cloud Lite services.

# SYSTEM APPROACH

- The "**System Approach**" section outlines the strategy and components used to develop and implement the Recipe Preparation Agent using IBM watsonx.ai.
- ✓ **System Requirements:**
- IBM Watsonx.ai (Agentic AI)
- User ingredient input via prompt
- Retrieval-Augmented Generation (RAG) technique
- Granite / Mistral foundation model
- Tools used: Prompt Lab, Browser Tool, Code Interpreter
- Recipe generation with substitutions and tips
- Deployed using Watsonx.ai Runtime
- (Optional) IBM Cloudant for recipe storage

# ALGORITHM AND DEPLOYMENT

- ✓ **Algorithm Selection:**
  - Retrieval-Augmented Generation (RAG) approach
  - Foundation Model: Granite-13b-instruct / Mistral-large
  - Prompt-based interaction for recipe generation
- ✓ **Data Input:**
  - User-provided list of available ingredients
  - No manual training (zero-shot prompting via Watsonx.ai)
- ✓ **Training Process:**
  - Model responds based on internal knowledge and retrieval tools
- ✓ **Prediction Process:**
  - Generates recipe title, steps, ingredients, substitutions, tips
  - Adapts output based on ingredient limitations and dietary needs
- ✓ **Deployment:**
  - Deployed using Watsonx.ai Runtime on IBM Cloud
  - Agent accessed via Preview and secured API endpoint
  - API key generated for integration

# RESULT

S

You 11:01 AM

Ingredients: rice, tomato, onion, salt, oil



Sous Chef 11:01 AM

Hi there! I'm Sous Chef, ready to help you create delicious meals with the ingredients you have. I'll even consider the current weather in your area to suggest the perfect dishes for the day! Could you please share your location and the ingredients you have on hand?

Current weather in New York: Temperature: 18.4°C Rain: 0mm Relative humidity: 79% Wind: 8.4km/h

Based on the ingredients you have (rice, tomato, onion, salt, oil) and the current weather in New York, here are a few recipe suggestions:

1. **Spanish Rice:** A flavorful side dish made with rice, tomatoes, onions, and seasonings. It's perfect for a mild day like today.
2. **Tomato and Onion Rice:** A simple and comforting dish made with rice, tomatoes, onions, and spices. It's a great option for a cozy meal.
3. **Fried Rice with Tomatoes and Onions:** A quick and easy dish made with rice, tomatoes, onions, and soy sauce. It's a versatile option that can be customized with additional vegetables or proteins.

Which recipe would you like to try?

Type something...





You 11:02 AM

Fried Rice



Sous Chef 11:02 AM

Here are some recipes for Fried Rice with Tomatoes and Onions:

**1. How To Cook The Easiest Tomato Fried Rice|Fried Rice - YouTube**

- Ingredients: 2 Cups cooked white rice, 50mls cooking oil, 1 Tbs Tomato paste, 1 whole tomato, 1 whole onion, Garlic Powder, Onion Powder, Chicken seasoning, Salt, Pepper
- [Recipe](#)

**2. Tomato and Garlic Fried Rice - Lord Byron's Kitchen**

- Ingredients: 2 cups cooked rice, 2 tablespoons olive oil, 1 small onion, finely chopped, 2 cloves garlic, minced, 1 large tomato, diced, 1 tablespoon soy sauce, 1 tablespoon lime juice, 1/4 teaspoon salt, 1/4 teaspoon black pepper, 2 tablespoons chopped fresh parsley
- [Recipe](#)

**3. Easy 15-minute Tomato Egg Fried Rice - Christie at Home**

- Ingredients: 2 cups cooked rice, 2 tablespoons vegetable oil, 2 cloves garlic, minced, 1 small onion, diced, 1 large tomato, diced, 2 eggs, beaten, 2 tablespoons soy sauce, 1 tablespoon sesame oil, 2 green onions, chopped, Salt and pepper, to taste
- [Recipe](#)

**4. Tomato Fried Rice | Little Fat Boy**

- Ingredients: 2 cups cooked rice, 2 tablespoons vegetable oil, 2 shallots, thinly sliced, 2 cloves garlic, minced, 2 anchovies, finely chopped, 8 ounces cherry tomatoes, halved, 1 tablespoon sesame oil, 1/2 teaspoon kosher salt, 1/4 teaspoon sugar, 2 tablespoons chopped fresh cilantro
- [Recipe](#)

Type something...





## 10. Fried Rice with Zucchini, Tomatoes and Parmesan – Smitten Kitchen

- Ingredients: 2 cups cooked rice, 2 tablespoons olive oil, 1 small onion, finely chopped, 1 small zucchini, diced, 1 large tomato, diced, 1/4 cup grated Parmesan cheese, Salt and pepper, to taste, 2 tablespoons chopped fresh parsley
- [Recipe](#)

Enjoy your cooking!

► [How did I get this answer?](#)



Type something...



# CONCLUSION

- The Recipe Preparation Agent effectively generates personalized recipes based on available ingredients.
- Utilizes IBM Watsonx.ai with Retrieval-Augmented Generation (RAG) to provide accurate and adaptive results.
- Helps users minimize food waste and improve cooking efficiency.
- Integrates cooking tips, ingredient substitutions, and dietary adjustments.
- Demonstrates the practical application of Agentic AI in everyday life.
- Can be extended further with real-time databases and voice interface.

# FUTURE SCOPE

- Integrate IBM Cloudant to store and retrieve a large variety of recipes
- Add voice assistant integration (e.g., Google Assistant, Alexa)
- Develop a mobile app for easy user access
- Provide multilingual recipe suggestions
- Suggest grocery shopping list for missing ingredients
- Include calorie tracking and nutritional analysis
- Enhance personalization using user history and preferences

# REFERENCES

- IBM Watsonx.ai Documentation – <https://www.ibm.com/products/watsonx-ai>
- IBM Cloud Documentation – <https://cloud.ibm.com/docs>
- IBM Agentic AI Lab (Watsonx.ai) – Used for AI Agent creation and deployment
- Food recipe datasets – Kaggle, Food.com (for inspiration and structure)
- Prompt Engineering for RAG – Best practices in building generative AI agents
- IBM Cloudant Documentation – <https://cloud.ibm.com/catalog/services/cloudant>
- IBM Developer Portal – Tutorials and labs on Watsonx.ai and Cloud Functions

# IBM CERTIFICATIONS

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Completion Certificate



This certificate is presented to

Kothamasi Sruthi

for the completion of

**Lab: Retrieval Augmented Generation with  
LangChain**

(ALM-COURSE\_3824998)

According to the Adobe Learning Manager system of record

**Completion date:** 25 Jul 2025 (GMT)

**Learning hours:** 20 mins

# GITHUB LINK

<https://github.com/Sruthi-1601?tab=repositories>



THANK YOU