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# CAPSTONE PROJECT

## PROJECT TITLE

**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**

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# PROBLEM STATEMENT

A Travel Planner Agent is an AI-powered assistant that helps users plan trips efficiently and intelligently. It uses real-time data to suggest destinations, build itineraries, and recommend transport and accommodation options. By understanding user preferences, budgets, and constraints, it tailors personalized travel plans. Integrated with maps, weather updates, and local guides, it ensures a smooth travel experience. The agent can also manage bookings, alert users to changes, and optimize schedules on the go. This smart assistant transforms complex travel planning into a seamless, enjoyable process.

# PROPOSED SOLUTION

- The proposed system aims to address the challenge of planning personalized, efficient, and adaptive travel itineraries based on user preferences, real-time data, and environmental factors. Planning a trip manually is time-consuming and often overwhelming due to the vast amount of information and unpredictable variables like weather, availability, and local events. The goal is to create an AI-powered Travel Planner Agent that can simplify this process by leveraging real-time search, weather updates, and intelligent itinerary optimization.. **The solution will consist of the following components:**
- **Data Collection:**
  - Gather information from the user on the location they want to visit, dates, budget and other user preference
  - Utilize real-time google search, weather conditions, events, and holidays, to enhance prediction itinerary planning.
- **Data Preprocessing:**
  - **Input Validation:** Ensure completeness and consistency in user-provided information (e.g., valid dates, budget range, preference options).
  - **Contextual Enrichment:** Enrich travel-related data with additional layers such as climate suitability, seasonal popularity, and real-time alerts (closures, disruptions).
- **AGENTIC AI APPROACH:**
  - **Autonomous Planning & Reasoning:** The AI agent autonomously interprets user goals and breaks them down into actionable tasks, using real-time data from tools like Google Search, DuckDuckGo, and weather APIs to create and adapt travel plans.
  - **Context-Aware Adaptation:** It continuously monitors changing conditions (e.g., weather, closures) and proactively adjusts itineraries on the fly, ensuring a seamless and personalized travel experience without manual intervention.
- **Deployment:**
  - Develop THE agentic ai chatbot in the ibm cloud platform(watsonx)
- **Evaluation:**
  - Assess the model's performance using appropriate metrics such as Mean Absolute Error (MAE), Root Mean Squared Error (RMSE), or other relevant metrics.
  - Fine-tune the model based on feedback and continuous monitoring of prediction accuracy.

# SYSTEM APPROACH

The "System Approach" section outlines the overall strategy and methodology for developing and implementing the rental bike prediction system. Here's a suggested structure for this section:

- System requirements
- Library required to build the model

# ALGORITHM & DEPLOYMENT

## AI Agent :

- An agentic AI system is used instead of static chatbot. It autonomously interprets user goals and dynamically plans trips using real-time data via IBM Cloud, Google/DuckDuckGo Search, and weather tools ideal for handling complex, context-driven travel planning.

## Data Input:

- **User inputs:** destination, dates, budget, preferences.
- **Real-time data:** weather, events, travel restrictions.
- **Search data:** attractions, hotels, local transport.

## System Prompt :

- the agent is guided by a detailed **system prompt** that defines its role, planning logic, tool usage, and safety boundaries. This prompt instructs the agent to behave proactively, adapt to user goals, query external data, and update itineraries dynamically.

## Planning & Recommendation Process:

- Decomposes user goals into actionable steps.
- Uses tools and live data to generate optimized, personalized itineraries.
- Continuously adapts plans in response to changing conditions

# TOOLS USED:

Select a tool

Choose a tool to add to your agent.

Q Search for a tool

<div><div></div><div>Google search</div><div>Retrieve information from the internet with the Google search engine.</div></div> <div><div></div><div></div></div>	<div><div></div><div>DuckDuckGo search</div><div>Retrieve information from the internet with the DuckDuckGo search engine.</div></div> <div><div></div><div></div></div>	<div><div></div><div>Wikipedia search</div><div>Retrieve information from Wikipedia articles.</div></div> <div><div></div><div></div></div>	<div><div></div><div>Document search</div><div>Search documents with vector indexes.</div></div> <div><div></div><div></div></div>	<div><div></div><div>Tavily search</div><div>Retrieve information from the internet with the Tavily search engine.</div></div> <div><div></div><div></div></div>
<div><div></div><div>Webcrawler</div><div>Retrieve information from a website.</div></div> <div><div></div><div></div></div>	<div><div></div><div>Python Interpreter</div><div>Execute Python code generated by the agent.</div></div> <div><div></div><div></div></div>	<div><div></div><div>Weather</div><div>Retrieve the weather of a city.</div></div> <div><div></div><div></div></div>		

# SYSTEM PROMPT :

Advanced configuration

Agent instructionsCommon instructions

Agent instructions are unique to this agent and will affect its specific behavior.

Reset to default

You are a Travel Planner AI Agent designed to assist users in planning personalized and efficient trips. Your task is to understand user preferences (such as destination, travel dates, budget, and interests) and generate tailored travel itineraries using real-time data and intelligent reasoning.

You have access to the following tools:

- Google Search: Use to retrieve general travel information, location highlights, tourist attractions, accommodations, and news.
- DuckDuckGo Search: Use as an alternative search engine for broader or privacy-focused queries.
- Wikipedia Search: Use to retrieve factual summaries of cities, attractions, landmarks, or cultural information.
- Webcrawler: Use to extract specific information from user-provided URLs (e.g., event schedules, booking sites).
- Weather: Use to retrieve weather forecasts for specific cities and dates, helping you tailor activities based on climate conditions.

Goals:

1. Extract user preferences through natural conversation.
2. Use tools strategically to gather relevant and up-to-date information.
3. Construct a daily itinerary based on user goals, timing, location logistics, and conditions.
4. Recommend alternatives if conflicts arise (e.g., bad weather, closed locations).
5. Communicate clearly and helpfully, asking only necessary follow-up questions.

Behavior Guidelines:

- Plan step-by-step: identify destination, gather relevant data, optimize schedule.
- When providing options (e.g., places to visit), suggest only 3–5 top recommendations unless asked for more.
- Consider travel time and group similar activities logically in the day plan.
- Adapt recommendations based on weather forecasts or event data if available.
- Do not make bookings unless explicitly instructed.

Output Format:

- Trip Summary: Based on user's input (dates, destination, goals).



# RESULT IMAGE 1 :

The screenshot displays the IBM watsonx Agent Lab interface, divided into two main sections: 'Build' and 'Agent preview'.

**Build Section:**

- Model:** mistral-large
- Framework:** LangGraph
- Architecture:** ReAct
- Instructions:** You are a Travel Planner AI Agent designed to assist users in planning personalized and efficient trips. Your task is to understand user preferences (such as destination, travel dates, budget, and interests) and generate tailored travel itineraries using real-time data and intelligent reasoning. You have access to the following tools:
- Tools:**
  - 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 Section:**

The chat window shows the following interaction:

- You:** 03:02 PM  
hi
- watsonx Agent:** 03:02 PM  
Hello! How can I assist you today?  
► **How did I get this answer?**
- You:** 03:04 PM  
Hi, I'm planning a 4-day trip to Jaipur from September 10th to 13th. I'd love to explore historical places, try authentic Rajasthani food, and shop for local handicrafts. I'll be staying near MI Road. Please include must-see palaces and forts, and suggest good food spots and markets. Also check the weather during those dates and avoid outdoor activities if there's rain. Suggest a practical daily plan with time slots if possible. I prefer auto or cab travel over walking long distances.
- watsonx Agent:** 03:04 PM  
**Trip Summary**
  - **Destination:** Jaipur
  - **Dates:** September 10th to 13th
  - **Goals:** Explore historical places, try authentic Rajasthani food, shop for local handicrafts
  - **Stay:** Near MI Road
  - **Travel Preference:** Auto or cab**Daily Itinerary**  
**Day 1: Arrival and Historical Exploration**
  - **Morning:**

The interface includes a top navigation bar with 'Upgrade', 'Gowri Kannan's Account', 'Dallas', and 'GK'. The 'Build' section has a sidebar with 'Setup', 'Configuration', 'Instructions', 'Knowledge', and 'Tools'. The 'Agent preview' section has a 'Share feedback' button and a 'Deploy' button.

# ANSWER BY AGENT:



watsonx Agent 03:04 PM

## Trip Summary

- **Destination:** Jaipur
- **Dates:** September 10th to 13th
- **Goals:** Explore historical places, try authentic Rajasthani food, shop for local handicrafts
- **Stay:** Near MI Road
- **Travel Preference:** Auto or cab

## Daily Itinerary

### Day 1: Arrival and Historical Exploration

- **Morning:**
  - Arrive in Jaipur and check into your accommodation.
  - Visit **Hawa Mahal** (Palace of Winds) to start your historical exploration.
- **Afternoon:**
  - Head to **City Palace** to explore the royal complex.
  - Have lunch at **Laxmi Misthan Bhandar** for authentic Rajasthani cuisine.
- **Evening:**
  - Visit **Jantar Mantar** to see the astronomical observatory.
  - Dinner at **Chokhi Dhani** for a traditional Rajasthani thali and cultural performances.

### Day 2: Forts and Shopping

- **Morning:**
  - Visit **Amer Fort** (Amber Fort) and enjoy the stunning views.
  - Explore **Jaigarh Fort** for its historical significance.
- **Afternoon:**
  - Have lunch at **Spice Court** for Keema Baati and Lal Maas.
  - Visit **Bapu Bazaar** for shopping local handicrafts and textiles.
- **Evening:**
  - Explore **Johari Bazaar** for gemstone jewelry and traditional Rajasthani items.
  - Dinner at **Niros Restaurant** for a mix of Indian and continental cuisine.

### Day 3: Palaces and Food

- **Morning:**
  - Visit **Jal Mahal** (Water Palace) and enjoy the scenic views.
  - Explore **Nahargarh Fort** for its historical and architectural beauty.
- **Afternoon:**
  - Have lunch at **Sharma Dhaba** for traditional Rajasthani dhaba-style food.
  - Visit **Tripolia Bazaar** for lac bangles and textiles.
- **Evening:**
  - Explore **Nehru Bazaar** for a variety of shopping options.
  - Dinner at **1135 AD** for an exquisite dining experience.

# USED MODEL :

## granite-3-3-8b-instruct

Provider: IBM | Version: 3.3 | Type: Provided model

Question answering Summarization Retrieval-Augmented Generation(...) Classification Generation Code generation and conversion Extraction Translation Function calling

**Note:** By using the model you agree to these terms.

[Read terms](#)

### Granite-3.3-8B-Instruct

**Model Summary:** Granite-3.3-8B-Instruct is a 8-billion parameter 128K context length language model fine-tuned for improved reasoning and instruction-following capabilities. Built on top of Granite-3.3-8B-Base, the model delivers significant gains on benchmarks for measuring generic performance including AlpacaEval-2.0 and Arena-Hard, and improvements in mathematics, coding, and instruction following. It also supports Fill-in-the-Middle (FIM) for code completion tasks and structured reasoning through <think></think> and <response></response> tags, providing clear separation between internal thoughts and final outputs. The model has been trained on a carefully balanced combination of permissively licensed data and curated synthetic tasks.

- **Developers:** Granite Team, IBM
- **Website:** [Granite Docs](#)
- **Release Date:** April 16th, 2025
- **License:** [Apache 2.0](#)

**Supported Languages:** English, German, Spanish, French, Japanese, Portuguese, Arabic, Czech, Italian, Korean, Dutch, and Chinese. However, users may finetune this Granite model for languages beyond these 12 languages.

**Intended Use:** This model is designed to handle general instruction-following tasks and can be integrated into AI assistants across various domains, including business applications.

#### Capabilities

- **Thinking**
- Summarization
- Text classification
- Text extraction
- Question-answering

Back

Select model

# STEPS BY AGENT:

## Day 4: Last-Minute Shopping and Departure

- **Morning:**
  - Visit **Chandpole Bazaar** for unique handicrafts and marble crafts.
  - Explore **Kishanpole Bazaar** for textiles and local crafts.
- **Afternoon:**
  - Have lunch at **Anokhi Café** for a relaxed dining experience.
  - Last-minute shopping at **MI Road** markets.
- **Evening:**
  - Departure from Jaipur.

### Additional Notes

- **Weather:** The weather in Jaipur during your visit is expected to be pleasant with no rain, making it ideal for outdoor activities.
- **Flexibility:** Feel free to adjust the itinerary based on your preferences and pace.
- **Travel Tips:** Use auto or cab services for convenient travel between locations.

Enjoy your trip to Jaipur! If you have any specific requests or need further assistance, feel free to ask.

Enjoy your trip to Jaipur! If you have any specific requests or need further assistance, feel free to ask.

### ▼ How did I get this answer?

- ✓ 1: {"location":"Jaipur"}
- ✓ 2: {"q":"Markets in Jaipur"}
- ✓ 3: {"q":"Markets in Jaipur"}
- ✓ 4: {"q":"Markets in Jaipur"}
- ✓ 5: {"q":"Markets in Jaipur"}
- ✓ 6: {"q":"Markets in Jaipur"}
- ✓ 7: {"q":"Markets in Jaipur"}
- ✓ 8: Generating final answer

Steps created by Agent


# DEPLOYED

[Deployment spaces](#) /

travel agent

Overview   Assets   Deployments   Jobs   Manage

## Jump back in

 watsonx Agent  
1 minute ago

[View all \(1\)](#)

## Deployments All ▾

 Deployed	 Failed
1	0

[View deployments](#)

## Job runs

 Active	 Failed last 24 hours ▾
0	0

[View jobs](#)

# RESULT

- The AI-powered Travel Planner Agent offers a comprehensive and adaptive trip planning experience. By intelligently combining user preferences with real-time search and weather data, it generates optimized, weather-aware, and interest-aligned itineraries. Deployed on IBM Cloud, the agent ensures scalability, accuracy, and user satisfaction, turning complex travel planning into an effortless and enjoyable task.

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# CONCLUSION

- The Travel Planner Agent effectively uses agentic AI to deliver personalized, real-time travel planning by integrating tools like Google Search, DuckDuckGo, and weather APIs via IBM Cloud.
- **Effectiveness:**  
It adapts to user preferences and real-world changes, offering flexible and optimized itineraries.

# FUTURE SCOPE

## Improvements and future scope:

- Add group planning
- Budget optimization
- Long-term user memory



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# REFERENCES

- Edunet IBM classes guided me throughout the journey
- Pdfs sent by edunet faculties

# IBM CERTIFICATIONS

In recognition of the commitment to achieve  
professional excellence



## Vigneshwaran Kannan

Has successfully satisfied the requirements for:

### Getting Started with Artificial Intelligence



Issued on: Jul 21, 2025  
Issued by: IBM SkillsBuild

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Has successfully satisfied the requirements for:

### Journey to Cloud: Envisioning Your Solution



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# IBM CERTIFICATIONS

IBM **SkillsBuild**

Completion Certificate



This certificate is presented to

Vignesh kannan

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**