
CAPSTONE PROJECT

AI-POWERED TRAVEL PLANNER AGENT

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OUTLINE

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PROBLEM STATEMENT

Planning a trip can be time-consuming and overwhelming, especially when balancing budget constraints, personal preferences, and limited knowledge about destinations. Travelers often struggle to create efficient itineraries, find suitable accommodations, and discover unique experiences without extensive research. The lack of personalized, real-time assistance makes the process tedious and error-prone. This project aims to develop an AI-powered Travel Planner Agent that simplifies travel planning by understanding user preferences, recommending destinations, and generating optimized itineraries. The agent provides budget-friendly, experience-rich travel plans using predefined tools and logic, transforming complex planning into a smooth, intelligent experience.

PROPOSED SOLUTION

- **Data Collection**

- Real-time information is fetched using tools like Google Search, DuckDuckGo, Wikipedia Search, Webcrawler, and Weather API.
- These tools provide up-to-date data on destinations, accommodations, weather, and travel activities.

- **Data Preprocessing:**

- Tool outputs are cleaned and filtered to retain only relevant, high-confidence content.
- Text is structured and prepared for input into the LLM.

- **Machine Learning Algorithm:**

- The system uses the LLaMA 3-3-70B Instruct model, following the ReAct reasoning framework via LangGraph.
- The agent decides which tools to invoke based on user input, gathers responses, and generates coherent, context-aware outputs.

- **Deployment:**

- Implemented using LangGraph, allowing modular tool chaining and agent flow control.
- Designed for easy deployment into a chatbot or web interface using Python microservices.

- **Evaluation:**

- Responses are tested using real-world queries for relevance, personalization, and clarity.
- Feedback is used to iteratively refine prompt structure and tool usage.
- Result: The agent generates reliable, budget-friendly, and personalized travel itineraries.

SYSTEM APPROACH

- **System requirements**

- The solution is deployed and executed entirely on IBM Cloud, using the Watsonx service with the LLaMA 3-3-70B Instruct model.
- All computation (inference, tool orchestration, and API integration) is handled on IBM's cloud infrastructure.
- Only a basic local machine is needed for development and testing: Any modern laptop with internet access.

- **Library required to build the model**

- LangGraph – For building the ReAct-style agent workflow and managing tool invocation and state transitions.
- Transformers – To work with large language models (if running locally or testing small models).
- Ibm-watsonx / IBM SDK – For interacting with the IBM Granite model via API (in production/deployment).

ALGORITHM & DEPLOYMENT

- **Algorithm Selection:**
 - Utilizes LLaMA 3–70B Instruct within a ReAct architecture using LangGraph.
 - The agent reasons through user queries and selects tools dynamically to gather and synthesize relevant information.
- **Data Input:**
 - Takes natural language input: destination, trip duration, preferences (e.g., budget, adventure).
 - Uses tools like Google Search, Wikipedia, Webcrawler, and Weather API to fetch real-time data.
- **Reasoning & Response Generation:**
 - No training phase required; the model is pre-trained.
 - The agent reasons through steps, invokes tools, and composes personalized travel recommendations in real time.
- **Deployment**
 - Hosted on IBM Cloud using the watsonx.ai service.

RESULT

IBM watsonx

Upgrade ?

Jenis Winsta's Account

Dallas

JW

Projects / Final_project / watsonx Agent

Share feedback

Autosaved 6:10 PM

New agent +

Deploy

Build

AI Model: llama-3-3-70b-instruct

Setup

Configuration

Framework Architecture

LangGraph ReAct

Instructions

Advanced configuration

You are a smart and friendly travel planning assistant. You help users plan trips by suggesting destinations, building day-wise itineraries, and recommending transport and accommodation options. You understand user inputs such as budget, duration, preferences (e.g., nature, history, adventure), and location.

Knowledge

Tools

Add a tool Create custom tool

Added tools (5)

Agent preview

JW You: 06:09 PM

i was looking for a vacation spot that is cost effective and with beach, sunlight and summer vibes.

watsonx Agent 06:09 PM

Based on the search results, here are some cost-effective beach vacation spots with sunlight and summer vibes:

1. Mykonos, Greece - known for its beautiful beaches and social vibes.
2. Milos, Greece - offers affordable and cute AirBnBs, as well as beautiful beaches.
3. Santorini, Greece - famous for its stunning views and romantic atmosphere.
4. Montenegro - an underrated destination in Europe, offering quiet and affordable beaches compared to nearby Dubrovnik.
5. Florida, USA - has several affordable beach destinations, such as Clearwater Beach, Daytona Beach, and Sanibel Island.

These destinations offer a range of activities, including swimming, sunbathing, and water sports, as well as a vibrant nightlife and cultural experiences. They are also relatively affordable, with options for budget-friendly accommodations and dining.

It's worth noting that the best time to visit these destinations depends on your preferences and budget. For example, peak season in Greece is June to August, while the off-season is September to May. In Florida, the peak season is December to April, while the off-season is May to November.

Type something...

RESULT

The screenshot displays the IBM watsonx Agent build interface. The top navigation bar includes the IBM watsonx logo, an 'Upgrade' button, a help icon, a notification bell, and user account information for 'Jenis Winsta's Account' in 'Dallas'. The main breadcrumb trail shows 'Projects / Final_project / watsonx Agent'. The interface is split into two main sections: 'Build' on the left and 'Agent preview' on the right.

Build Section:

- Model:** llama-3-3-70b-instruct
- Framework:** LangGraph
- Architecture:** ReAct
- Instructions:** A text area containing the prompt: "You are a smart and friendly travel planning assistant. You help users plan trips by suggesting destinations, building day-wise itineraries, and recommending transport and accommodation options. You understand user inputs such as budget, duration, preferences (e.g., nature, history, adventure), and location." A link for 'Advanced configuration' is also present.
- Knowledge:** A section for adding knowledge.
- Tools:** Buttons for 'Add a tool' and 'Create custom tool'.

Agent preview Section:

- User Message (JW):** "You: 06:12 PM also can you add visa free options for indians"
- Agent Response (watsonx Agent):** "Here are some visa-free beach destinations for Indians:"
 - 1. Maldives
 - 2. Mauritius
 - 3. Thailand
 - 4. Indonesia (Bali)
 - 5. Fiji
 - 6. Seychelles
 - 7. Sri Lanka
 - 8. Cook Islands
- Additional Text:** "These destinations offer a range of experiences, from relaxing on pristine beaches to exploring rich cultural heritage. They are also relatively affordable and offer a variety of accommodation options. It's always a good idea to check the latest visa requirements and travel regulations before planning your trip. Additionally, consider factors such as safety, cost, and activities available when choosing a destination."
- Input Field:** A text box at the bottom with the placeholder "Type something..." and a send button.

RESULT



You: 06:24 PM

I want a 2-day travel itinerary for the Maldives. It should be budget-friendly and include adventurous and memorable experiences. Please suggest unique places and activities that make the trip special.



watsonx Agent 06:24 PM

Here's a suggested 2-day travel itinerary for the Maldives that's budget-friendly and includes adventurous and memorable experiences:

Day 1: Arrival and Water Activities

- Arrive at Malé International Airport and take a ferry to your guesthouse in Malé (approximately \$10-\$20 USD per person)
- Check-in at your guesthouse and freshen up
- Visit the Artificial Beach and try your hand at snorkeling or swimming (free admission)
- Take a ferry to the nearby island of Hulhumalé (approximately \$5-\$10 USD per person) and go snorkeling at the Hulhumalé Reef (approximately \$20-\$30 USD per person)
- Enjoy a sunset cruise (approximately \$20-\$30 USD per person) and watch the stars come out

Day 2: Island-Hopping and Local Culture

- Take a ferry to the island of Villingili (approximately \$10-\$20 USD per person) and explore its beautiful beaches and coral reefs
- Visit the Villingili Beach and enjoy a picnic lunch (approximately \$10-\$20 USD per person)
- In the afternoon, visit the Malé Museum (approximately \$5-\$10 USD per person) and learn about the history and culture of the Maldives

- Enjoy a traditional Maldivian tea and snack at a local café (approximately \$5-\$10 USD per person)
- Depart from Malé International Airport

Budget Breakdown:

- Accommodation: approximately \$30-\$50 USD per night (guesthouse)
- Transportation: approximately \$10-\$30 USD per person (ferry)
- Food: approximately \$10-\$20 USD per meal (local restaurants and street food)
- Activities: approximately \$20-\$50 USD per person (snorkeling, sunset cruise, etc.)

Total estimated cost for the 2-day itinerary: approximately \$250-\$400 USD per person

Note: The estimated costs are subject to change and may vary depending on the time of year, availability, and other factors. It's always a good idea to research and book in advance to get the best deals.

Unique Places and Activities:

- Snorkeling at the Hulhumalé Reef: This reef is known for its vibrant marine life and is a great spot for snorkeling.
- Sunset Cruise: Watch the sunset over the ocean and enjoy the stunning views.
- Villingili Beach: This beach is known for its crystal-clear waters and powdery white sand.
- Malé Museum: Learn about the history and culture of the Maldives at this museum.
- Traditional Maldivian Tea and Snack: Try some local tea and snacks at a traditional café.

This itinerary provides a mix of adventure, culture, and relaxation, and is budget-friendly. However, keep in mind that the Maldives is a luxury destination and prices can be high. It's always a good idea to research and book in advance to get the best deals.

CONCLUSION

- The AI-Powered Travel Planner Agent simplifies the travel planning process by combining the reasoning capabilities of LLaMA 3–70B with real-time information retrieval through integrated tools. Using LangGraph and the ReAct architecture, the system delivers personalized itineraries based on user preferences, budget, and location. Hosted on IBM Cloud, the solution eliminates the need for preloaded data and provides dynamic, reliable travel suggestions. This project demonstrates the potential of agentic AI in enhancing user experience through intelligent, context-aware automation.

FUTURE SCOPE

- **Voice Interaction:** Integrate voice-based input and responses to allow hands-free, conversational trip planning for a more natural user experience.
- **Mobile App Integration:** Develop a mobile application to make the agent more accessible on the go, enabling real-time updates and itinerary access during travel.
- **Real-Time Scam Alerts:** Incorporate alerts for travel-related scams or fake booking sites by monitoring trusted sources, enhancing user safety and trust.

REFERENCES

- IBM Documentation – Agent Lab:

<https://dataplatform.cloud.ibm.com/docs/content/wsj/analyze-data/fm-agent-lab.html?context=wx&audience=wdp>

- IBM watsonx.ai – AI Agent Development:

<https://www.ibm.com/products/watsonx-ai/ai-agent-development>

- LangGraph: Building AI Agents

<https://github.com/langchain-ai/langgraph>

- Meta AI – LLaMA 3 Model Card

<https://ai.meta.com/llama/>

- Hugging Face Transformers – LLaMA 3

<https://huggingface.co/meta-llama>

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Completion Certificate



This certificate is presented to

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**Lab: Retrieval Augmented Generation with
LangChain**

(ALM-COURSE_3824998)

According to the Adobe Learning Manager system of record

Completion date: 24 Jul 2025 (GMT)

Learning hours: 20 mins



THANK YOU