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Personalized Travel Budget Planning using Large Language Models – AI Trip Helper

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Introduction

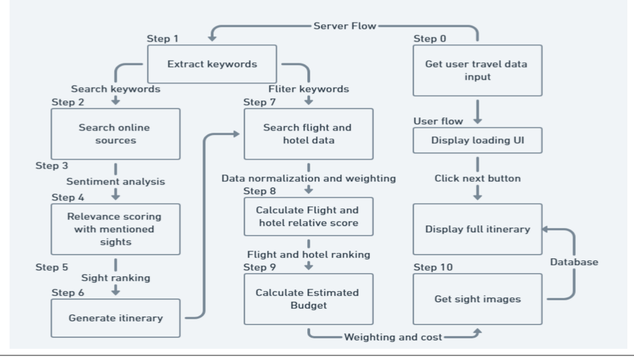
Imagine planning your dream vacation with an AI companion that understands your travel style, manages your budget, and crafts the perfect itinerary. The AI Trip Helper brings this vision to life by combining cutting-edge Generative AI technology with intelligent travel planning.

Traditional travel planning often involves hours of research across multiple websites, complex budget calculations, and the challenge of finding trustworthy recommendations. Our solution transforms this process into a seamless experience, where AI works alongside you to create personalized travel plans that match your preferences and budget.

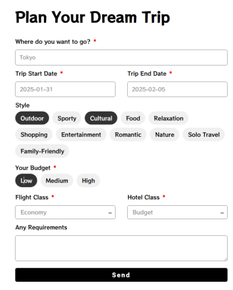
Objectives

- Develop an AI-powered travel planning system that transforms user preferences into personalized and comprehensive travel itineraries.
- To integrate and process vast amounts of travel data from multiple sources for accurate and up-to-date recommendations.
- To create an intelligent budget optimization system that provides real-time cost analysis and smart spending recommendations.
- To deliver an intuitive and user-friendly interface that simplifies the complex travel planning process.

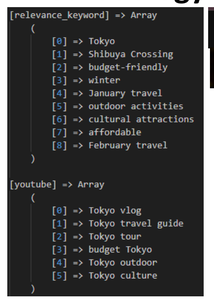
Methodology



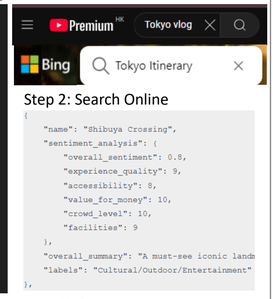
Methodology



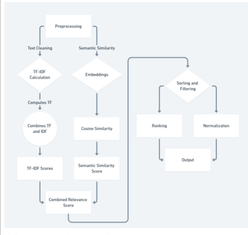
Step 0: Collect User Data



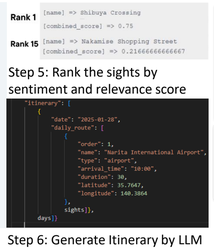
Step 1: Extract keywords by LLM



Step 3: Analysis sentiment score

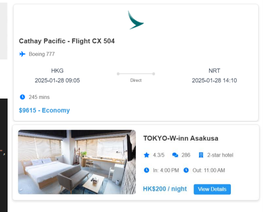


Step 4: Analysis relevance score

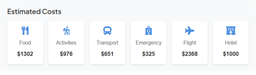


Step 5: Rank the sights by sentiment and relevance score

Step 6: Generate Itinerary by LLM



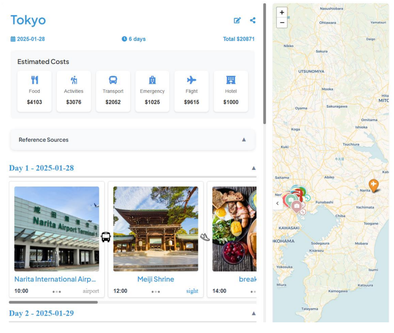
Step 7 & 8: Search for flights & hotel and rank the options



Step 9: Calculate the estimated trip cost in difference aspect

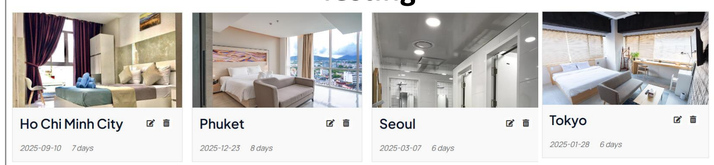
Step 10: Search for sight images

Step 11: Save to Database



Last Step: Design the interface for displaying the itinerary and add interactive functions

Testing



To evaluate the system's ability to generate complete travel itineraries based on varying user requirements and preferences.

Steps	Time	Steps	Time
Step 1: Keyword extraction	2.2s	Step 7.1: Flight Search	2.1s
Step 2: Online Source Search	4.6s	Step 8.1: Flight Analysis	0.03s
Step 3: Sentiment Analysis	27.5s	Step 7.2: Hotel Search	2.6s
Step 4: Relevance Check	3.6s	Step 8.2: Hotel Analysis	0.01s
Step 5: Location Sorting	4.0s	Step 9: Budget Processing	0.02s
Step 6: Itinerary Generation	18.8s	Step 10: Image Processing	0.63s

To evaluate the processing speed and performance of various system components in the trip planning pipeline.

Conclusion

The AI Trip Helper project has successfully achieved its primary objectives of creating an intelligent, AI-driven travel planning system. Through the integration of GenAI technology, the system demonstrates significant capabilities in personalized travel planning, budget optimization, and user experience design.

Key Achievements

- Implemented budget optimization algorithms with high relativity
- Achieved highly personalized itinerary recommendation
- Successfully integrated real-time data from multiple sources
- Developed an intuitive, user-friendly interface
- Created comprehensive travel planning functionalities