# ItinAIgenius

Submitted in partial fulfillment of the requirements of the degree

**BACHELOR OF ENGINEERING** IN **COMPUTER ENGINEERING**

By

**Riddhi Labde/26**

**Priti Shamnani/53**

**Neha Valecha/64**

Name of the Mentor

**Prof.** Pallavi Gangurde



**Vivekanand Education Society's Institute of Technology,**

**An Autonomous Institute affiliated to University of Mumbai**

**HAMC, Collector's Colony, Chembur,**

**Mumbai-400074**

**University of Mumbai (AY 2023-24)**

# CERTIFICATE

This is to certify that the Mini Project entitled **" ItinAIgenius "** is a bonafide work of **Priti Shamnani (53), Riddhi Labde (26),Neha Valecha (64)** submitted to the University of Mumbai in partial fulfillment of the requirement for the award of the degree of **"Bachelor of Engineering"** in **"Computer Engineering"** .

**(Prof.Pallavi Gangurde)**

Mentor

**(Prof. Nupur Giri)**

Head of Department

**(Prof. J.M Nair)**

Principal

# Mini Project Approval

This Mini Project entitled " **ItinAIgenius"** by **Priti Shamnani (53), Riddhi Labde (26),Neha Valecha (64)** is approved for the degree of **Bachelor of Engineering** in **Computer Engineering.**

**Examiners**

**1……………………………………**
(Internal Examiner Name & Sign)

**2...............................................**
(External Examiner name & Sign)

Date:

Place:

# Contents

# ABSTRACT

In recent years, recommender systems and planning system have been used as a solution to support tourists with recommendations and itinerary planning oriented to maximize the entertainment value of visiting a tourist destination. However, this is not an easy task because many aspects need to be considered to make realistic recommendations and generate itinerary :the context of a tourist destination visited, lack of updated information about points of interest,transport information, weather forecast,etc.

The recommendations concerning a tourist destination must be linked to the interest and constraints of the tourist. In this we present a system based on the Tourist Trip Design Problem(TTDP)/Time Depending(TD)/ Orienteering Problem(OP)-Time Windows(TW), which analyzes in real time the user's constraint and point of interest's constraint.. For solving TTDP, we clustered preferences depending on the number of days that a tourist will visit a tourist destination using an algorithm. Then,we optimize the proposed itineraries to tourists for facilitating the organization of their visits. We also used a function to include any element of the context to generate an optimized recommendation.

Our system is different from others because it is scalable and adaptable to environmental changes and users interests, and it offers real-time recommendations and routes. To test our system, we developed an application that uses our algorithm.The functionalities of the system can be customized according to the current issues faced by people around the world.

# Acknowledgement

"We want to say a big 'thank you' to Vivekanand Education Society's Institute of Technology for helping us with our project. They were there for us from the start, assisting us in gathering the information we needed.

We're very thankful to Assistant Professor Ms. Pallavi Gangurde for guiding us and giving us valuable advice as we developed our project idea.

Dr. Mrs. Nupur Giri, who heads the Computer Department, and our Principal, Dr. Mrs. J.M. Nair, gave us the chance to work on this project. Without their support, it would have been tough to complete our project successfully.

We also want to thank all the teachers and staff for their constant support and help. The Computer Engineering Department was especially helpful.

Our sincere thanks go out to everyone who helped us collect information for the project. And, of course, we're grateful to our families for always supporting and encouraging us.

Our project's success is a result of the help and support from all these wonderful people, and we're very thankful for that.

# List of Abbreviations

| Contents | Abbreviation |
|----------|--------------|
| Artificial Intelligence | AI |
| Uniform Resource Locator | URL |
| Hyper Text Markup Language | HTML |
| Cascading Style Sheet | CSS |
| Application Programming Interface | API |

# List of Figures

# List of Tables

| Table No | Table | Page No |
|----------|-------|---------|
| 2.1 | Survey of Existing System | 3 ,4 |

# Chapter 1 : Introduction

## 1.1 Introduction

When you're tired of your usual routine, a vacation can be a refreshing change. But planning one can be a real hassle these days. You have to spend a lot of time looking up hotels, places to visit, and how to get around. It can feel like a big chore. That's where our project comes in to help!

Our goal is to make vacation planning a lot easier for you. We create a travel plan that's based on what you like and what you want to do. Instead of spending hours searching online, you just tell us a few things.where you want to go, when you'll be going, what kind of trip you want, and what kind of hotels you prefer. With this information, we'll put together a plan that covers everything.

Imagine having a roadmap for your whole trip – the best way to get from one place to another, the coolest things to see, and even where to eat. It's like having a personal travel guide who knows all the best spots.

We want to take away the stress of planning so you can enjoy your vacation. We'll make sure you don't miss out on anything exciting and help you make the most of your time. So, instead of worrying about all the details, you can focus on having a great time and exploring new places.

## 1.2 Motivation

**Affordable Travel Planning Access:** The project aims to make tailored travel planning accessible to everyone, bridging the gap between those who can afford personalized travel advisors and those who cannot.

**Simplified Travel Planning:** By simplifying the complex process of travel planning, the project provides a one-stop solution, reducing stress and making travel planning more enjoyable**.**

**Flexible Solutions:** ItinAIgenius offers flexibility for different traveler needs, whether for leisure, adventure, relaxation, or cultural exploration.

**Financial Accessibility:** It alleviates the financial burden of expensive travel advisors, making customized travel planning affordable for a wider range of travelers

## 1.3 Problem Statement & Objectives

The travel and tourism industry is constantly evolving, and travelers are seeking more personalized and efficient experiences. Traditional travel planning can be time-consuming and overwhelming, often leading to suboptimal itineraries. To address these challenges, the problem statement for " **ItinAIgenius**" can be defined as follows:

"Travelers today face difficulties in planning their trips, as they have to sift through vast amounts of information from various sources, leading to inefficient, time-consuming, and sometimes unsatisfactory travel experiences. There is a need for a smart itinerary system that can streamline the travel planning process, provide personalized recommendations, and enhance the overall travel experience."

To tackle the problem statement effectively, the following objectives can be set for the development of a " **ItinAIgenius**" system:

**Efficient Travel Planning:** Develop a platform that enables travelers to plan their trips more efficiently, taking into account their preferences, interests, and constraints (e.g., budget, time).

**Personalization**: Implement AI-driven algorithms that can personalize itineraries based on individual preferences, such as cultural interests, food preferences, and activity levels.

**Recommendation Engine**: Create a recommendation system that suggests destinations, attractions, accommodations, and activities based on user profiles and historical data.

**Budget Management:** Incorporate budget management tools that assist travelers in planning and monitoring their expenses throughout the trip.


## 1.4 Organization of the Report

The organization of the report on "**ItinAIgenius**" can play a crucial role in effectively conveying the information and findings. Below is a suggested structure for the report:

1. **User Profile and Personalization**:
   - Detail how user profiles are created and how personalization is achieved.
   - Explain the role of AI and recommendation algorithms in tailoring itineraries.

2. **Real-time Information and Data Integration**:
   - Discuss the sources of real-time data, such as weather updates and local events.
   - Explain how data is integrated into the system for user benefit**.**

3. **Budget Management and Booking**:
   - Describe the tools and features for budget planning and management.
   - Explain how users can make bookings directly through the platform.

4. **Safety and Emergency Assistance:**
   - Present features related to safety tips, local emergency contacts, and emergency assistance requests.

**5. Feedback and Continuous Improvement**:
  - Explain the feedback collection process and how it informs system enhancements.

**6. Sustainability and Responsible Tourism:**
  - Discuss the information and features promoting sustainable and responsible tourism.

**7. Data Security and Privacy:**
  - Describe the measures taken to ensure data security and user privacy.

**8. Partnerships and Integration:**
  - Detail the partnerships with travel agencies, transportation providers, and local businesses.
  - Explain the benefits for users through these partnerships.

**9. Recommendations:**
  - Provide actionable recommendations for further improvements or expansion of the system.

**10. Future Developments**:
  - Discuss potential future developments and enhancements for the " **ItinAIgenius**" system.

This well-structured report will provide a comprehensive view of the " **ItinAIgenius**" system, its development process, and its potential to enhance the travel planning and tourism experience for users.

# Chapter 2 : Literature Survey

## 2.1 Survey of Existing System/SRS

| Topic name | Methodology | Limitation | Future Scope |
|---|---|---|---|
| 1)"Itinerary recommender system with semantic trajectory pattern mining from geo-tagged photos" Author - Guochen Cai, Kyungmi Lee, Ickjai Lee - 2018 | Used for mining people movements and trajectory patterns. A photo together with geographic information and time stamp indicates a user's footprint, the place the user visits and the time the user spends there. | Privacy Concerns: Users may be hesitant to share their geo-tagged photos and personal information due to privacy concerns. Striking a balance between personalization and privacy is a challenge. | Expand the system to cover a wider range of global destinations and languages to make it accessible to a more diverse user base. |
| 2).Wanderlust : A Personalised Travel Itinerary Recommender Author - Tarun Surender Reddy, Jenila Rakesh Sanghvi, Deval Paresh Vora, Pratik Kanani | The project makes use of a topical package space model which incorporates hashtags, travel cost spread, time of travel of each point of interest which is then mined to coalesce the gap between optimized travel routes and user's travel interest. | Limited Creativity: Recommender systems can become predictable, suggesting popular tourist destinations or activities repeatedly. This can limit the discovery of unique or off-the-beaten-path experiences. | Asking the user about its eating preferences and based on that the system can suggest restaurants near every point of interests |

| 3) Smart Travel Itinerary Planner Author - Mrs. S. Sangeetha Mariammal , S B Akshaya , M Priyanga, S Saran Kumar, P Prakash | This approach gathers URLs of various tourist attractions from TripAdvisor and Holidify and in stages, information about tourist attractions and reviews will be pulled from the URLs collected | Keeping the system up-to-date with the latest travel information, trends, and machine learning algorithms can be resource-intensive and challenging. The system may have limitations in terms of the geographic areas it covers. It might work well for popular tourist destinations but not as effectively for less-visited or remote locations. | Provide a module/space for users to submit their trip blogs and vlogs. This will result in increased website utilization, turning it into a commercial product. |
| --- | --- | --- | --- |

| | | | |
|---|---|---|---|
| 4) A multi-agent system for itinerary suggestion in smart environments Author - Alessandra De Paola, Salvatore Gaglio, Andrea Giammanco, Giuseppe Lo Re, Marco Morana | Associations between groups and itineraries are computed by solving a Multi-Armed Bandit problem. | Simplified Assumptions: The system's recommendations are based on certain assumptions that might not always match the complexity of real-life travel situations. Scalability: It may work well for a small number of users but could face challenges if used by a large number of people simultaneously. | Deploying our system in a real-world POI, Using more types of smartphone sensors to gather more types of onsite travel behaviors to learn tourists' preference precisely, Harnessing real-time congestion information at each spot of a scenic area to generate more reasonable travel routes and further improve tourists' travel experience |
| 5) The task-oriented Smart Tourism Chatbot Service Author -Hoon-cheol Kang1, Myeong-Cheol , Jeong-Woo Jwa | The smart tourism platform consists of the smart tourism chatbot and smart tourism information systems.The smart tourism chatbot system identifies the intention of the user's question and searches for the tourism information ID in the information knowledgebase. | Some chatbots may not integrate well with other platforms or services, limiting their ability to assist users in booking accommodations, transportation, or activities seamlessly. | Plan to develop a smart tourism chatbot service that provides tourism information QA services through smart tourism platforms and mobile apps |

## 2.2 LIMITATION OF EXISTING SYSTEM

The limitations of the existing systems mentioned in the provided information are as follows:

1. Privacy Concerns:The "Itinerary recommender system with semantic trajectory pattern mining from geo-tagged photos" may face privacy concerns as users may be hesitant to share their geo-tagged photos and personal information. Balancing personalization and privacy is a challenge for this system.

2. Limited Creativity: Recommender systems, in general, can become predictable, suggesting popular tourist destinations or activities repeatedly, which can limit the discovery of unique or off-the-beaten-path experiences.

3.. Scalability: It may work well for a small number of users but could face challenges if used by a large number of people simultaneously.

4.Maintenance and Updates: Keeping the system up-to-date with the latest travel information, trends, and machine learning algorithms can be resource-intensive and challenging.

5.Integration with Other Services: Some chatbot-based systems, like "The task-oriented Smart Tourism Chatbot Service," may not integrate well with other platforms or services, limiting their ability to assist users in booking accommodations, transportation, or activities seamlessly.

## 2.3 MINI PROJECT CONTRIBUTION

The development of an ItinAIgenius project carries profound implications that extend far beyond the realm of travel. At its core, this project contributes to a significant transformation in how individuals plan their journeys, offering personalized travel itineraries based on user preferences. By simplifying and enhancing the travel planning process, it streamlines decision-making and promotes a more enjoyable and stress-free experience for travelers. Crucially, this innovation transcends accessibility boundaries, making travel more inclusive for individuals with diverse needs.

It empowers travelers to explore the world with greater ease and confidence, regardless of disabilities or unique requirements. Additionally, the project delivers time and resource savings for users, as AI efficiently takes care of the planning and research process. On a broader scale, it generates valuable data and insights that can help identify emerging travel trends and enhance services in the travel industry. Furthermore, by recommending sustainable and eco-friendly travel options, it promotes responsible tourism and contributes to environmental conservation efforts. Beyond these notable impacts, this project has the potential to empower local businesses and foster economic growth in lesser-known destinations. Technologically, it signifies a milestone in the intersection of AI, machine learning, and geospatial data, setting a precedent for future advancements. In essence, this project redefines the travel planning experience, making it more accessible, efficient, and enjoyable, while simultaneously offering cross-industry potential and advancing the cause of human-centric technology.

# Chapter 3: Proposed System

## 3.1 Introduction

Our ItinAIgenius project is here to change the way people plan their trips. It's like having a helpful travel buddy right in your pocket. We'll ask you a few questions about where you want to go, when you want to go, what kind of trip you want, and your hotel preferences. Then, we'll create a custom plan just for you.

No more hours of searching online or worrying about what to do. We'll give you a roadmap for your entire trip – the best way to get around, the coolest things to see, and even where to eat.

We're all about taking the stress out of planning so you can focus on having a fantastic time exploring new places. It's your one-stop solution to making the most of your vacation.
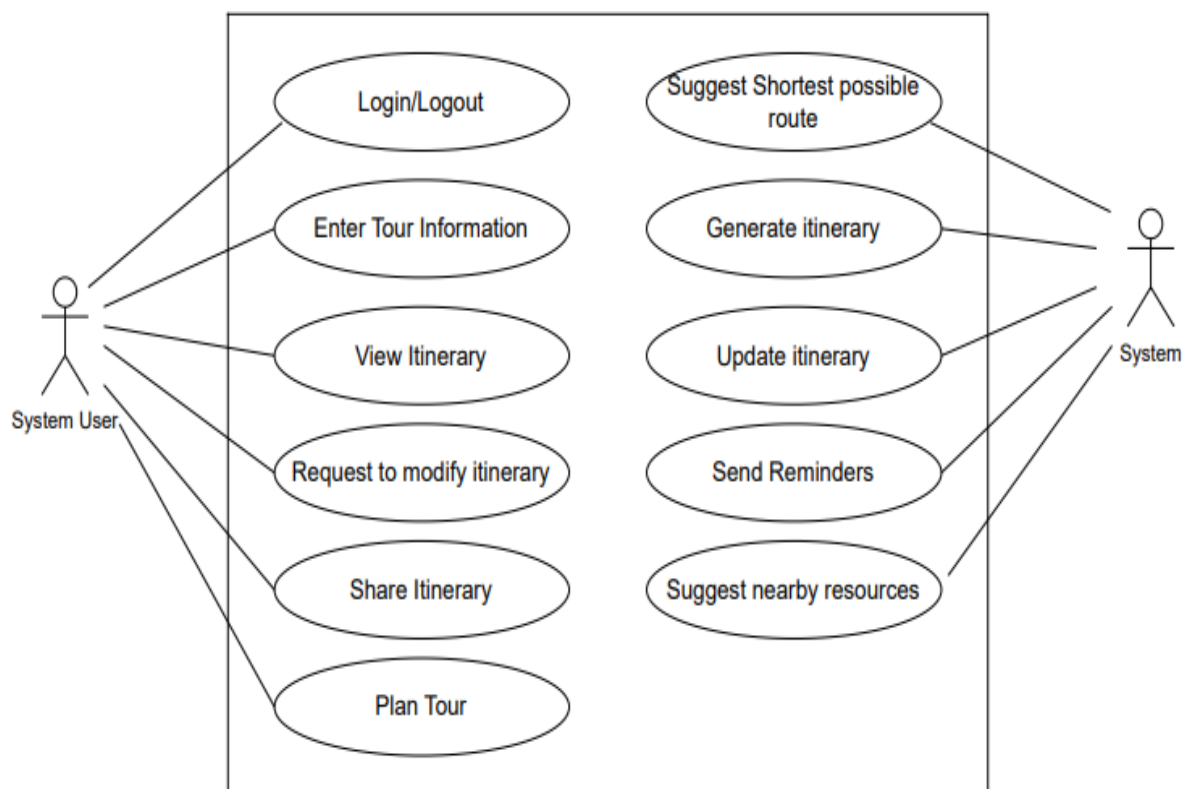
## 3.2 Architectural Framework/ Conceptual Design



Figure 3.2.1 Use Case Diagram

A use case description is a detailed document that outlines how a specific feature or aspect of a system, application, or product works from the perspective of a user or actor. Use cases are often used in software development and systems analysis to describe the various interaction

## 3.3 Algorithm and Process Design

ItinAIgenius sounds like an exciting project aimed at revolutionizing the way people plan their trips. The project's core functionality appears to involve an AI-powered travel planner that simplifies the trip planning process. Here's a breakdown of the process and design based on the information provided:

1. User Input:

   - The system begins by asking the user a series of questions to gather information about their travel plans. This likely includes questions about the destination, travel dates, trip type (e.g., leisure, business, adventure), and hotel preferences.

2. Customization:

   - The AI then utilizes the user's input to generate a customized travel plan. This plan takes into account the user's preferences, making it a tailored experience.

3. Trip Planning:

   - The system goes beyond basic itinerary creation. It plans the entire trip, including transportation options, attractions to visit, and restaurant recommendations. It aims to provide a comprehensive roadmap for the user's journey.

4. Stress Reduction:

   - One of the key goals of ItinAIgenius is to eliminate the stress associated with travel planning. By automating the process, users can avoid hours of online research and uncertainty about what to do during their trip.

5. User Focus:

   - The project emphasizes that its primary goal is to allow users to concentrate on enjoying their trip rather than being bogged down by planning details. This makes it a user-centric solution.

6. One-Stop Solution:

   - ItinAIgenius positions itself as a one-stop solution for travelers, indicating that it can assist with various aspects of trip planning, from transportation and sightseeing to dining.

To execute this project effectively, you would need the following components:

- User Interface: A user-friendly interface, possibly a mobile app, where users can input their travel details and preferences.

- AI and Recommendation Engine: A robust AI system that can analyze user input, access relevant travel information, and generate personalized recommendations for each user.

- Data Sources: Access to a wide range of travel-related data, including destination information, transportation options, and restaurant reviews.

- Integration with External Services: Integration with external services such as booking platforms, maps, and restaurant databases to provide real-time information and reservations.

- Feedback Mechanism: A way for users to provide feedback and refine the AI's recommendations based on their experiences.

- Privacy and Security: Ensuring user data privacy and security in accordance with regulations and best practices.

- Scalability: The system should be able to handle a growing number of users and destinations.

Overall, ItinAIgenius has the potential to greatly enhance the travel planning experience for users by leveraging AI and automation to create personalized, stress-free travel itineraries.

## 3.4 Methodology Applied

ItinAIgenius methodology encompasses following stages and consideration

1. User-Centered Design:

   We initiate the project by conducting in-depth user research, engaging with travelers to understand their unique preferences and needs. This foundational understanding guides the entire development process.

2. Defining Requirements:

   Meticulously document detailed requirements, including user preferences, travel constraints, and desired features for itinerary generation:
   - Travel Dates
   - Budget
   - Interests (e.g., nature, culture, adventure)
   - Destination Preferences
   - Accessibility Preferences (e.g., wheelchair-friendly options)

3. Destination Selection and Customization:
   - We will design the AI-driven TravelGenius to cater to diverse travel preferences:
   - Match user profiles with suitable destinations.
   - Enable customization of itineraries, allowing users to specify their travel goals and interests.

4. Itinerary Generation:
   - Implement an AI-driven algorithm for generating day-by-day travel itineraries:
   - Optimize routes to minimize travel time.
   - Consider travel distances and durations between destinations.

5. Nearby Resource Information:
   - Integrate real-time data sources for nearby resources like petrol pumps, ATMs, restaurants, and accommodations.
   - Ensure accuracy and up-to-date information for user convenience.

6. User Interface Design:
   - Developing a user-friendly interface with an emphasis on accessibility:
   - High-contrast design.
   - Large, legible text.
   - Intuitive navigation elements.

7. User Input and Preferences:

- Implement a user-friendly input form for gathering travel preferences, including dates, interests, and budget.

8. User Feedback and Customization:
   - Creating a feedback system to allow users to review and customize generated itineraries.
   - Use user feedback for continuous improvement of recommendations.

9. Quality Assurance and Testing:
   - Conduct rigorous testing, including:
     - Functional testing to ensure accurate recommendations.
     - Usability testing to evaluate the user experience.
     - Testing for accessibility features.

10. Deployment:
    - Deploy TravelGenius as a user-friendly web or mobile application to ensure widespread accessibility.

11. Feedback Loop and Continuous Improvement:**
    - Continuously update and enhance the AI model and data sources based on user feedback and changing travel conditions.

By following this methodology, ItinAIgenius aims to deliver a user-centric, accessible, and AI-driven travel itinerary platform that caters to diverse traveler needs and preferences, enhancing the overall travel experience.

## 3.5 Hardware & Software Specifications

Hardware Requirements:
- Hard disk:  100 GB
- RAM:        512 MB
- Processor:  Intel

Software Requirements:
- Languages : Java,Python
- Technologies : Java script , HTML, CSS
- Web server : Apache Tomcat server
- Data base : My SQL, Mongo db
- Operating system : Windows XP/7/

## 3.6 Experiment and Results for Validation and Verification
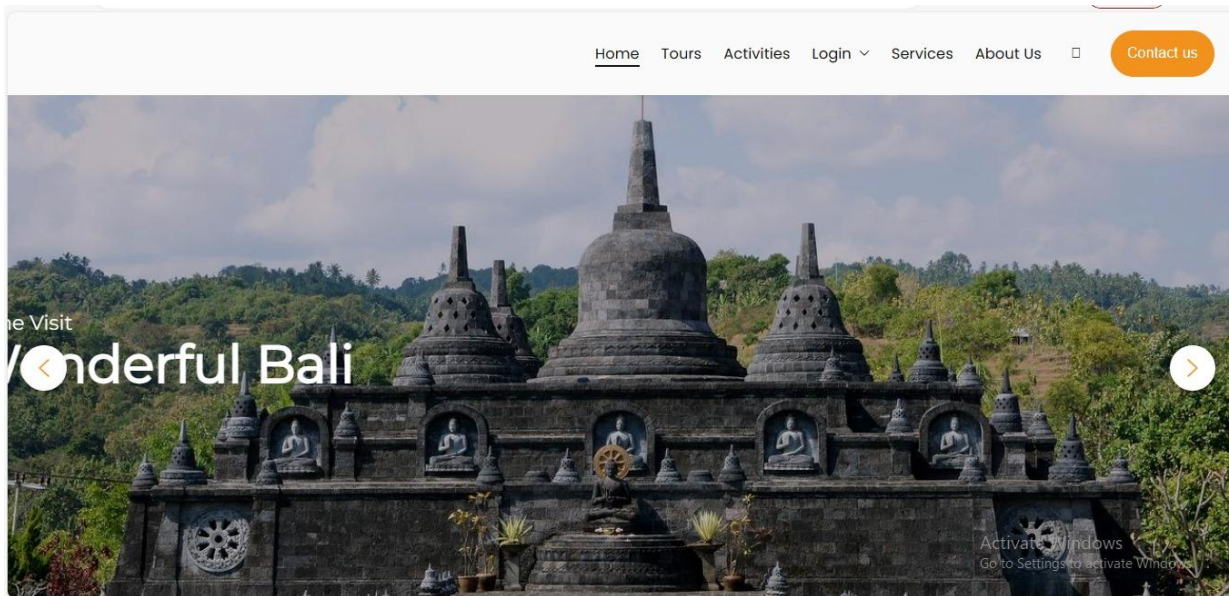


Figure 3.6.1 Home Page

Home page will contain options like HOME, TOUR, ACTIVITIES, LOGIN where a person can login as a user or admin  also the services which we are planning to offer.
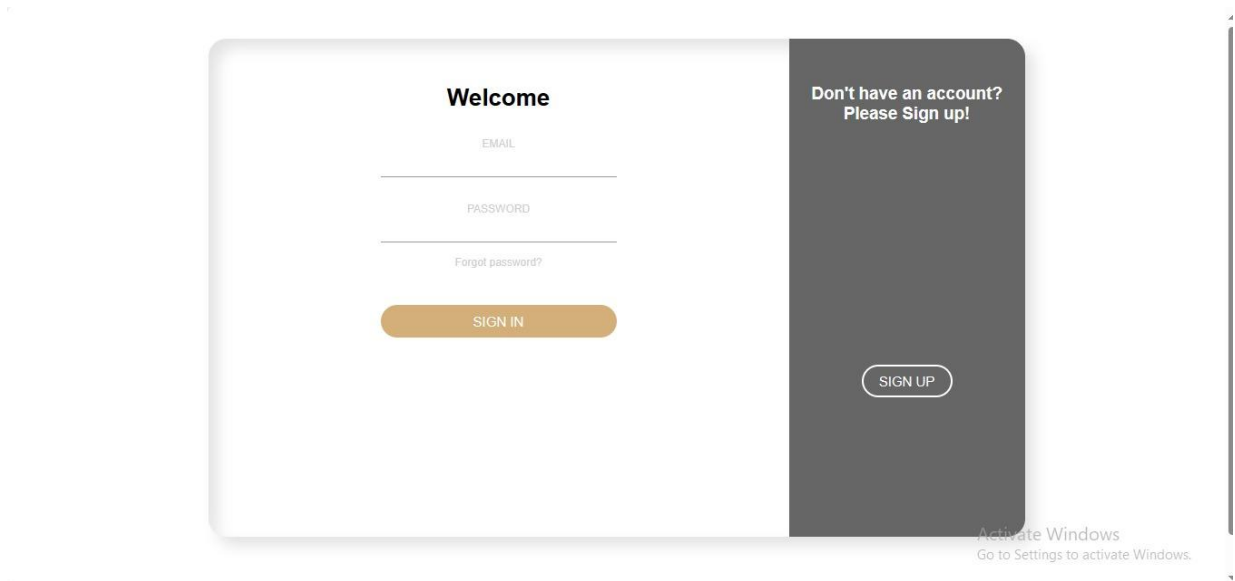


Figure 3.6.2 Login Page

A login page is a web page or application screen that serves as the entry point for users to access a secured system, website, or application. Its primary purpose is to verify the identity of

the user and grant access only to those who have the necessary credentials, typically a username or email address and a password.
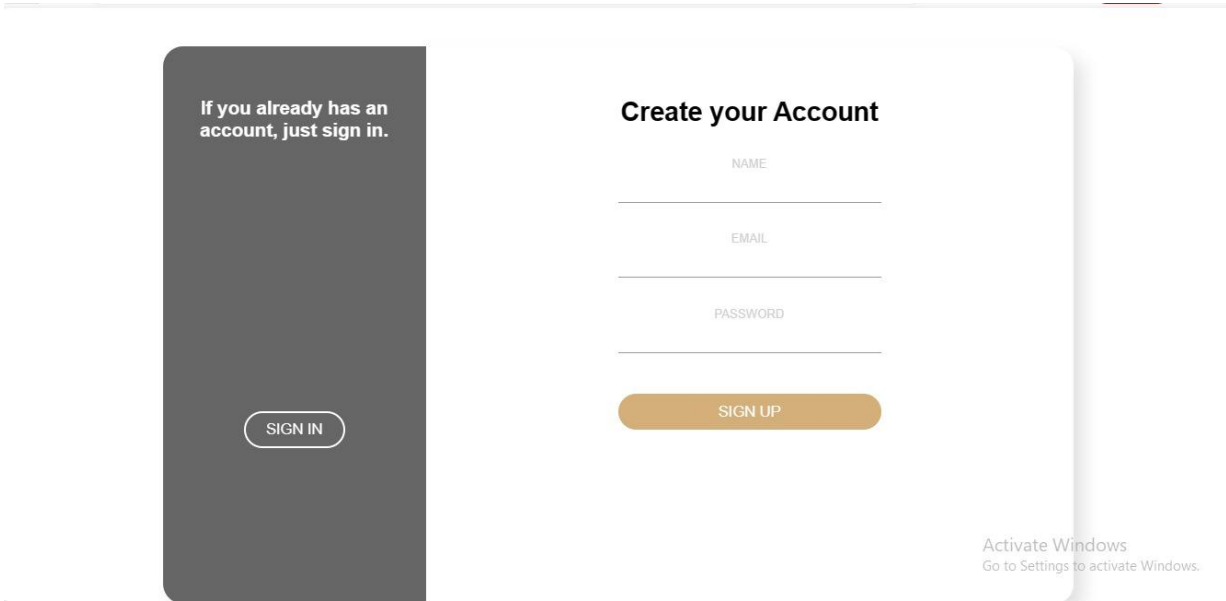
Figure 3.6.3 Sign Up Page

A sign-up page is a web page or application screen where individuals can create new accounts or user profiles to gain access to a particular website, service, or application. The purpose of a sign-up page is to collect user information and establish a unique identity within the system.
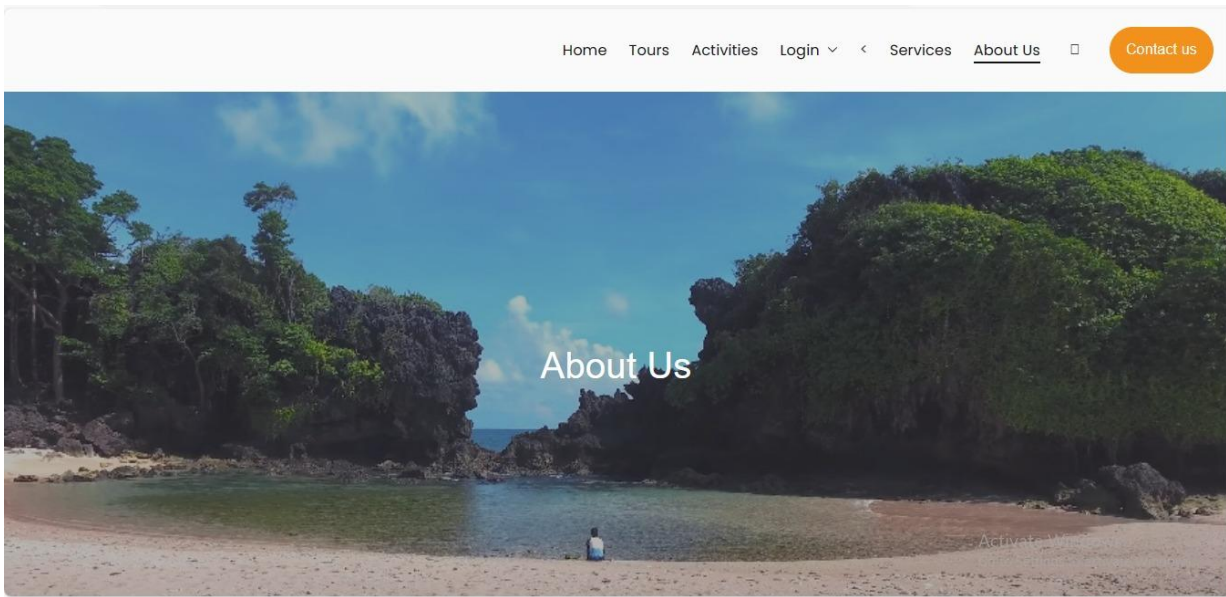


Figure 3.6.4 About Us Page

An "About Us" page it serves as a way for visitors to learn more about the entity, its mission, history, and key personnel.
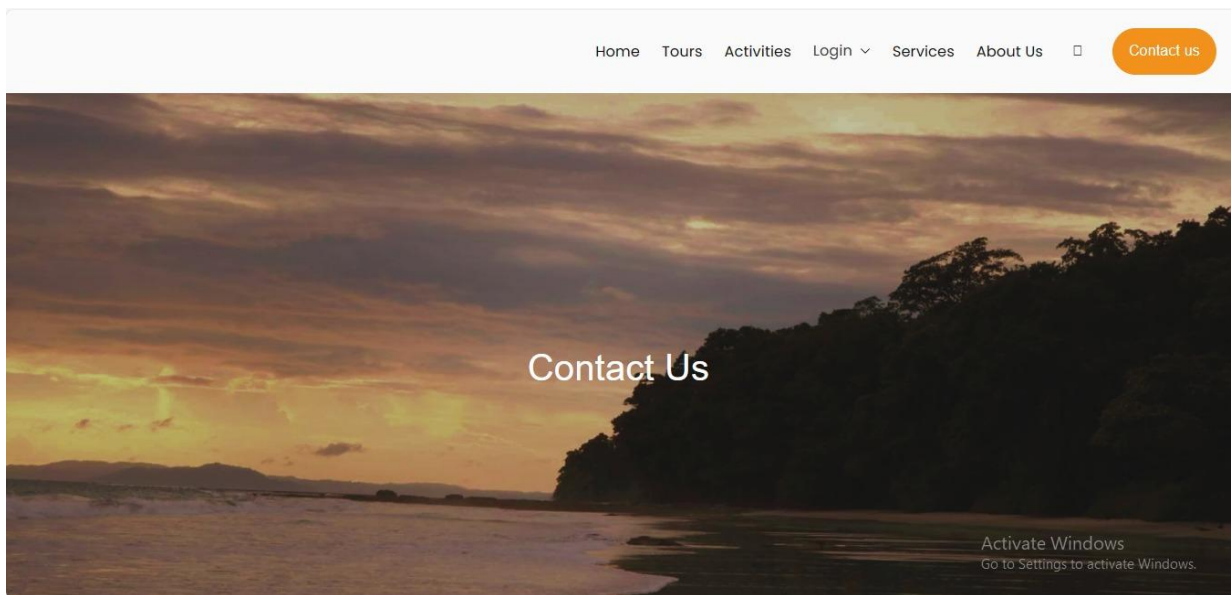
Figure 3.6.5 Contact Us Page

A "Contact Us" page is a standard web page or section of a website that serves as a direct channel of communication between visitors or customers.
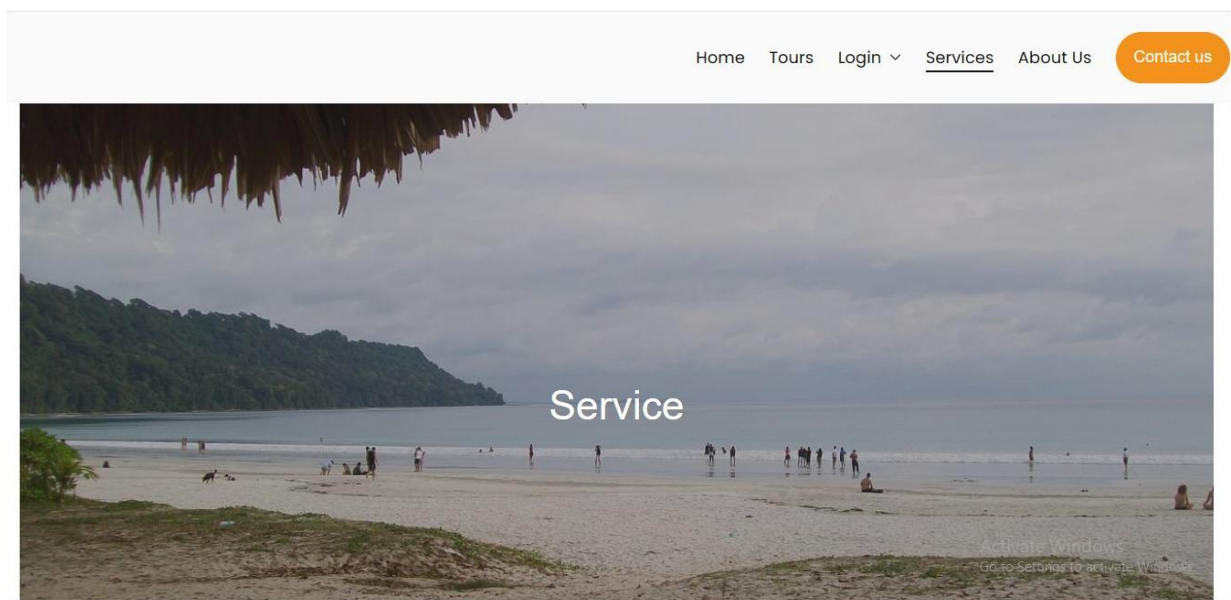


Figure 3.6.6 Tourism Service Page

A service description is a detailed explanation of the services offered by a company, organization, or individual. It provides potential customers or clients with a clear understanding of what the service entails, its features, benefits, and how it can meet their needs.

# 3.7 Conclusion and Future work

**Conclusion:**

From the analysis of the result, we can conclude that our ItinAIgenius is able to meet up the requirement for the traveler for a great traveling experience. It enables secure, fast and easy usage. We can also conclude that the use of a ItinAIgenius will definitely benefit the user by saving storage and time of the user which in turn makes this system user and practice-friendly.

**Future Work:**

Expanding the language support of the ItinAIgenius platform would make it accessible to a more diverse range of users. Consider incorporating multilingual capabilities to cater to international travelers. Implement advanced machine learning techniques and predictive analytics to offer users personalized recommendations based on their historical travel data and preferences. This would create even more tailored itineraries. Enable users to share their itineraries and travel experiences on social media platforms or connect with fellow travelers. This social integration can enhance the sense of community and provide valuable insights. Develop an offline mode for ItinAIgenius, allowing travelers to access their itineraries and essential information without an internet connection. This is particularly useful for destinations with limited connectivity. Consider integrating voice assistants, such as Amazon Alexa or Google Assistant, to make ItinAIgenius even more accessible. Users can interact with the platform through voice commands, further enhancing convenience.Investigate the use of AR technology to provide travelers with real-time information about points of interest and directions, enhancing their on-site experience.

# References

[1] Chen C, Zhang D, Guo B, Ma X, Pan G, Wu Z (2017) "Trip Planner: personalized trip planning leveraging heterogeneous crowdsourced digital footprints. IEEE Trans Intell Transp System"

[2] Mickael F , Jose R , Nelio C, Antonio Thome  (2018)"From Photos to Travel Itinerary: A Tourism Recommender System for Smart Tourism Destination". IEEE Fourth International Conference on Big Data Computing Service and Applications.

[3]Kwan Hui Lim, Jeffrey Chan, Shanika K ,Christopher Leckie (2019) "Tour recommendation and trip planning using location-based social media: a survey". Springer

[4]Ho, R.C., Amin, M., Ryu, K. and Ali, F.(2021) "Group-Wise Itinerary Planning in Temporary Mobile Social Network", Springer

[5]Jian Meng,Neng Xu(2018),"An Adaptive Genetic Algorithm for Personalized Itinerary Planning",Springer