

# Final Fall Design Report

**Team: Sethu Kruthin & Sai Venkata Subhash Vakkalagadda**

## Smart Travel

Agent that plans and books entire vacations. A user could provide a budget, travel dates, and interests (e.g., "a relaxing beach vacation in Southeast Asia for under \$2,000"), and the agent would research destinations, compare flight and hotel options, and present a complete, bookable itinerary.

### Team Members:

- Sethu Kruthin Nagari – Major: Computer Science – Email: [nagarisn@mail.uc.edu](mailto:nagarisn@mail.uc.edu)
- Sai Venkata Subhash Vakkalagadda – Major: Computer Science – Email: [vakkalsh@mail.uc.edu](mailto:vakkalsh@mail.uc.edu)

**Advisor:** Dr. Nitin Nitin

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### 1. **Team Names & Project Abstract**

Sethu Kruthin Nagari – Major: Computer Science – Email: [nagarisn@mail.uc.edu](mailto:nagarisn@mail.uc.edu)

Sai Venkata Subhash Vakkalagadda – Major: Computer Science –  
Email: [vakkalsh@mail.uc.edu](mailto:vakkalsh@mail.uc.edu)

### 2. **Project Description**

Agent that plans and books entire vacations. A user could provide a budget, travel dates, and interests (e.g., "a relaxing beach vacation in Southeast Asia for under \$2,000"), and the agent would research destinations, compare flight and hotel options, and present a complete, bookable itinerary.

### 3. **User Stories:**

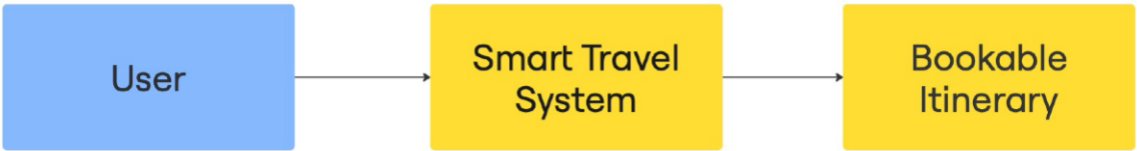
- As a traveler, I want to enter my budget and travel dates so that I can receive vacation options that fit my financial and time constraints.
- As a vacation planner, I want to compare flights, hotels, and activities so that I can book the best possible itinerary within my preferences.
- As a frequent flyer, I want to save my favorite destinations so that I can quickly access and plan repeat trips in the future.
- As a first-time user, I want to receive personalized recommendations based on my interests so that I can explore destinations suited to my lifestyle.
- As a busy professional, I want the system to automatically generate and book a full itinerary so that i can save time and avoid the stress of manual planning

### **Design Diagrams:**

### Design D0

**Project title:** Smart Travel

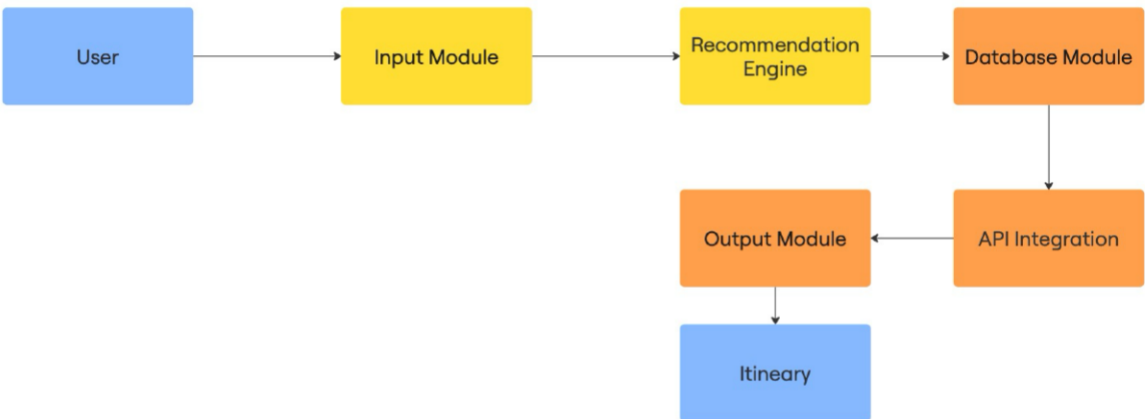
**Goal Statement:** The goal of the *Smart Travel* project is to design and implement an intelligent travel agent system that allows users to input their budget, travel dates, and interests, and automatically generates a personalized, bookable vacation itinerary. The system will integrate flight, hotel, and activity options through external APIs, apply artificial intelligence to match user preferences with optimal choices, and deliver an efficient, user-friendly solution that simplifies the travel planning process.



### Design D1

**Project title:** Smart Travel

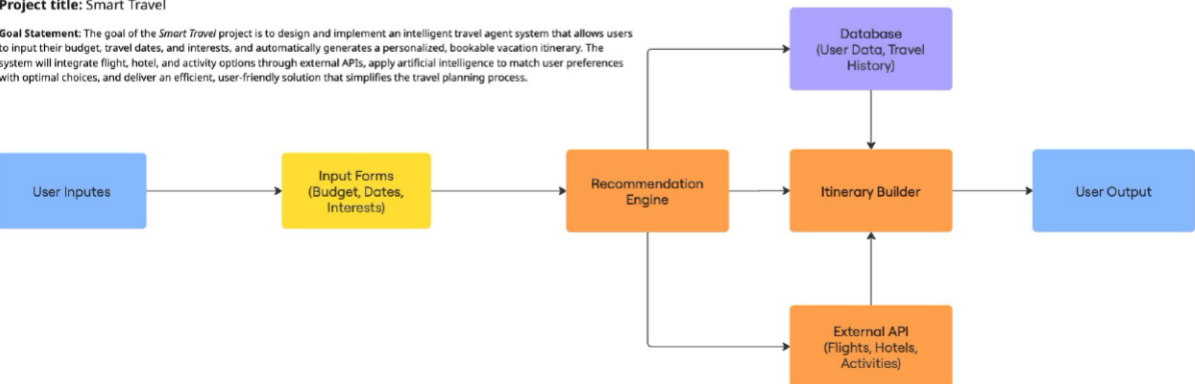
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### Design D2

**Project title:** Smart Travel

**Goal Statement:** The goal of the *Smart Travel* project is to design and implement an intelligent travel agent system that allows users to input their budget, travel dates, and interests, and automatically generates a personalized, bookable vacation itinerary. The system will integrate flight, hotel, and activity options through external APIs, apply artificial intelligence to match user preferences with optimal choices, and deliver an efficient, user-friendly solution that simplifies the travel planning process.



## 4. Project Task & Timeline

### TaskList

**Project:** Smart Travel

**Team Members:** Sethu Kruthin Nagari, Sai Venkata Subhash Vakkalagadda

#### Project Specific Tasks

1. Research available travel APIs (flights, hotels, activities) to determine integration feasibility
  - **Primary Responsibility:** Sethu Kruthin Nagari
2. Specify user requirements for budget, travel dates, and interest preferences
  - **Primary Responsibility:** Sethu Kruthin Nagari
3. Design the high-level database schema for storing users, preferences, and itineraries
  - **Primary Responsibility:** Sethu Kruthin Nagari
4. Develop the input forms (budget, date picker, interest categories) for the user interface
  - **Primary Responsibility:** Sai Venkata Subhash Vakkalagadda
5. Implement the database schema in SQL and connect it with the application backend
  - **Primary Responsibility:** Sai Venkata Subhash Vakkalagadda
6. Design the recommendation engine using AI principles (heuristic search, filtering, ranking)
  - **Primary Responsibility:** Sai Venkata Subhash Vakkalagadda
7. Integrate flight booking API into the backend system
  - **Primary Responsibility:** Sai Venkata Subhash Vakkalagadda
8. Integrate hotel booking API into the backend system
  - **Primary Responsibility:** Sai Venkata Subhash Vakkalagadda
9. Develop the itinerary builder that combines flights, hotels, and activities into a single plan
  - **Primary Responsibility:** Sethu Kruthin Nagari
10. Create database queries to retrieve and update user preferences and travel history
  - **Primary Responsibility:** Sai Venkata Subhash Vakkalagadda
11. Test the input module for correct data capture and validation
  - **Primary Responsibility:** Sethu Kruthin Nagari
12. Test the recommendation engine for accuracy and performance
  - **Primary Responsibility:** Sai Venkata Subhash Vakkalagadda
13. Validate the API integrations by simulating real travel bookings

## **Milestones List**

This list outlines the major milestones for the "Smart Travel" project, which will guide development from the initial design phase through final implementation and delivery. The project focuses on creating an AI-powered travel agent that generates personalized, bookable vacation itineraries.

### **Milestone 1: Project Initiation & Detailed Design(Completed by Dec 2025) 。**

**Description:** This initial milestone covers all foundational planning and design work completed during the Fall 2025 semester. It includes finalizing user stories, establishing team roles and communication protocols, securing faculty approval, and creating a detailed system architecture. The goal is to have a complete blueprint for development before implementation begins.

**Deliverables:** Team Contract , Individual Biographies and Assessments , Approved High-Level System Designs (D0, D1, D2) , and a finalized Task List with responsibilities.

### **Milestone 2: Backend Foundation & Database Implementation (Target: Jan 31, 2026) 。**

**Description:** This milestone focuses on building the project's technical backbone. It involves translating the database schema design into a functional SQL database and connecting it to the application's backend. This creates the necessary infrastructure for storing user data, preferences, and travel histories.

**Deliverables:** Implemented database schema in PostgreSQL/MySQL and a functional backend API capable of performing basic Create, Read, Update, Delete (CRUD) operations on the database.

### **Milestone 3: Minimum Viable Product (MVP) with Recommendation Engine (Target: Feb 28, 2026)**

**Description:** This is a critical milestone where the core intelligence of the system is developed. It involves implementing the user input forms and the AI-driven recommendation engine. The MVP will be able to take a user's budget, dates, and interests and generate a basic, non-bookable travel suggestion by querying the database.

**Deliverables:** A functional user interface for data input and a working recommendation engine that returns personalized results based on heuristic search and filtering.

#### **Milestone 4: External API Integration (Target: Mar 20,2026) 。**

**Description:** This milestone bridges the gap between our system and real-world travel data. It involves researching, selecting, and integrating external APIs for flights and hotels. The system will be able to fetch live data to enhance the recommendations with realtime options.

**Deliverables:** Successful integration of at least one flight booking API and one hotel booking API into the backend.

#### **Milestone 5: End-to-End Itinerary Builder (Target: Apr10, 2026) 。**

**Description:** This milestone focuses on combining all developed components user inputs, recommendations, and live API data into a single, cohesive plan. The system will be able to generate a complete, user-friendly itinerary that is ready for booking.

**Deliverables:** A fully functional itinerary builder that combines flights, hotels, and activities into a formatted plan.

#### **Milestone 6: System Testing, Final Documentation, &Project Delivery (Target: Apr 17, 2026) 。**

**Description:** The final milestone ensures the project is robust, reliable, and well-documented. It involves comprehensive testing of all modules, from input validation to booking simulation. Final user and system documentation will be completed and added to the project repository.

**Deliverables:** Completed test reports, final user documentation, a polished and deployable application, and a final project presentation.

Task Description	Start Date	Completion Date
1. Research available travel APIs (flights, hotels, activities)	Dec 1, 2025	Dec 20, 2025
2. Specify user requirements for budget, travel dates, and interest preferences	Dec 1, 2025	Dec 20, 2025
Milestone 1: Project Initiation & Detailed Design	---	Dec 20, 2025
3. Design the high-level database schema for users, preferences, and itineraries	Jan 6, 2026	Jan 17, 2026
5. Implement the database schema in SQL and connect it with the application backend	Jan 18, 2026	Jan 31, 2026
Milestone 2: Backend Foundation & Database Implementation	---	Jan 31, 2026

4. Develop the input forms (budget, date picker, interest categories) for the user interface	Feb 1, 2026	Feb 14, 2026
6. Design the recommendation engine using AI principles (heuristic search, filtering, ranking)	Feb 1, 2026	Feb 24, 2026
10. Create database queries to retrieve and update user preferences and travel history	Feb 15, 2026	Feb 28, 2026
Milestone 3: Minimum Viable Product (MVP) with Recommendation Engine	---	Feb 28, 2026
7. Integrate flight booking API into the backend system	Mar 1, 2026	Mar 15, 2026
8. Integrate hotel booking API into the backend system	Mar 1, 2026	Mar 15, 2026
Milestone 4: External API Integration	---	Mar 20, 2026
9. Develop the itinerary builder that combines flights, hotels, and activities	Mar 16, 2026	Apr 3, 2026
14. Refine the itinerary builder output to include user-friendly formatting and export to PDF	Apr 4, 2026	Apr 10, 2026
Milestone 5: End-to-End Itinerary Builder	---	Apr 10, 2026
11. Test the input module for correct data capture and validation	Apr 11, 2026	Apr 17, 2026
12. Test the recommendation engine for accuracy and performance	Apr 11, 2026	Apr 21, 2026
13. Validate the API integrations by simulating real travel bookings	Apr 11, 2026	Apr 21, 2026
15. Document system modules, workflows, and user instructions in the project repository	Apr 11, 2026	Apr 24, 2026
Milestone 6: System Testing, Final Documentation, & Project Delivery	---	Apr 24, 2026

Task	Primary Responsibility	Effort (Sethu K. Nagari)	Effort (Sai Vakkalagadda)
1. Research available travel APIs	Sethu Kruthin Nagari	60%	40%
2. Specify user requirements	Sethu Kruthin Nagari	70%	30%

3. Design the high-level database schema	Sethu Kruthin Nagari	60%	40%
4. Develop the input forms for the user interface	Sai Vakkalagadda	40%	60%
5. Implement the database schema in SQL and connect it	Sai Vakkalagadda	20%	80%
6. Design the recommendation engine using AI principles	Sai Vakkalagadda	30%	70%
7. Integrate flight booking API	Sai Vakkalagadda	25%	75%
8. Integrate hotel booking API	Sai Vakkalagadda	25%	75%
9. Develop the itinerary builder	Sethu Kruthin Nagari	70%	30%
10. Create database queries to retrieve and update data	Sai Vakkalagadda	30%	70%
11. Test the input module	Sethu Kruthin Nagari	70%	30%
12. Test the recommendation engine	Sai Vakkalagadda	30%	70%
13. Validate the API integrations	Sai Vakkalagadda	40%	60%
14. Refine the itinerary builder output	Sethu Kruthin Nagari	80%	20%
15. Document system modules, workflows, and user instructions	Sethu Kruthin Nagari	75%	25%

## 5. ABET Concerns Essay

The Smart Travel project's design and implementation are shaped by several critical restrictions. Economically, the team works with little resources, depending mostly on free and open-source tools like Python libraries, PostgreSQL databases, and public APIs for trip information. There is no external financing or business sponsorship, thus access to premium APIs or commercial hosting services is limited. This constraint necessitates the development of a cost-effective architecture that maximizes performance while lowering expenses.

From an ethical aspect, the system must ensure that AI behaves responsibly when proposing destinations, avoiding biased or dangerous travel suggestions. The team must ensure that the algorithm does not favor specific

areas or demographics unjustly, and that user data is treated publicly and respectfully.

In terms of legal limits, Smart Travel must adhere to data protection standards such as the GDPR and CCPA, particularly because it handles sensitive user data such as names, budgets, and preferences. To avoid intellectual property difficulties, all external APIs and datasets must be properly licensed and attributed.

Finally, security limits are critical for the project's profitability. As consumers disclose sensitive travel information, data encryption, secure authentication, and secure API connectivity are critical. The team must safeguard against data breaches, eavesdropping, and the misuse of stored information.

Overall, these restrictions govern the team's efforts to create a system that is cost-effective, ethical, compliant, and secure, ensuring Smart Travel's continued functionality and social responsibility.

## **6. PPT Slide Show**



# SmartTravel

*An Intelligent Travel Planning and  
Recommendation System*

Sethu Kruthin Nagari  
Sai Venkata Subhash Vakkalagadda

# Smart Travel Agent

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- **Purpose:** The Smart Travel project aims to simplify and automate holiday planning by using artificial intelligence to develop individualized travel itineraries. The solution will save consumers time and effort by intelligently automating location research, price comparisons, and bookings.
- **Goal:** Smart Travel's mission is to construct and implement an AI-powered travel advisor that generates comprehensive, bookable holiday itineraries based on a user's budget, travel dates, and preferences. The project seeks to provide accurate, efficient, and user-friendly travel recommendations by combining APIs for flights, hotels, and activities.



# Team Members

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Sethu Kruthin Nagari  
[nagarisn@mail.uc.edu](mailto:nagarisn@mail.uc.edu)

Sai Venkata Subhash  
Vakkalagadda  
[vakkalsh@mail.uc.edu](mailto:vakkalsh@mail.uc.edu)

Advisor: Dr. Nitin Nitin

# Project Abstract

The Smart Travel Agent simplifies trip planning using AI. Users enter travel preferences, and the system generates optimized itineraries including flights, hotels, and activities. It uses NLP to interpret input, integrates with booking APIs, and applies AI for recommendations and budget optimization.

# User Stories

- As a traveler, I want to enter my budget and travel dates so that I can receive vacation options that fit my financial and time constraints.
- As a vacation planner, I want to compare flights, hotels, and activities so that I can book the best possible itinerary within my preferences.
- As a frequent flyer, I want to save my favorite destinations so that I can quickly access and plan repeat trips in the future.
- As a first-time user, I want to receive personalized recommendations based on my interests so that I can explore destinations suited to my lifestyle.
- As a busy professional, I want the system to automatically generate and book a full itinerary so that I can save time and avoid the stress of manual planning.



# Design Diagrams

## Design D0

**Project title:** Smart Travel

**Goal Statement:** The goal of the Smart Travel project is to design and implement an intelligent travel agent system that allows users to input their budget, travel dates, and interests, and automatically generates a personalized, bookable vacation itinerary. The system will integrate flight, hotel, and activity options through external APIs, apply artificial intelligence to match user preferences with optimal choices, and deliver an efficient, user-friendly solution that simplifies the travel planning process.

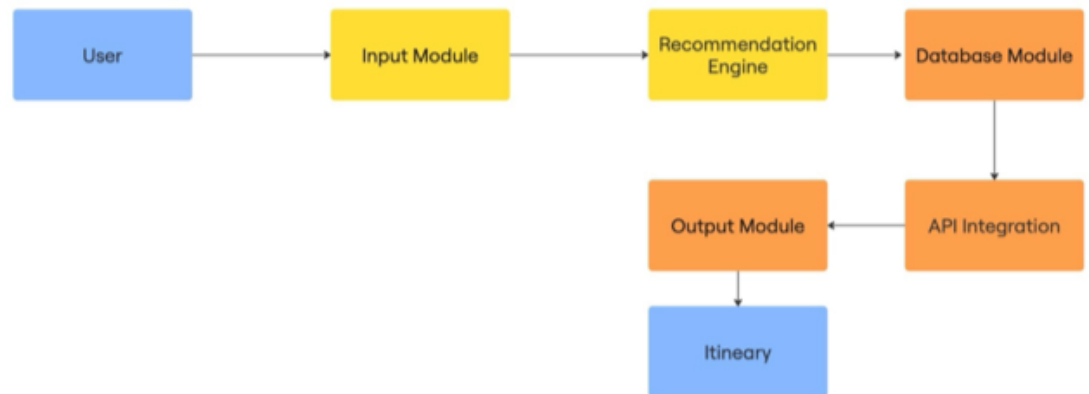


# Design Diagrams

## Design D1

**Project title:** Smart Travel

**Goal Statement:** The goal of the Smart Travel project is to design and implement an intelligent travel agent system that allows users to input their budget, travel dates, and interests, and automatically generates a personalized, bookable vacation itinerary. The system will integrate flight, hotel, and activity options through external APIs, apply artificial intelligence to match user preferences with optimal choices, and deliver an efficient, user-friendly solution that simplifies the travel planning process.

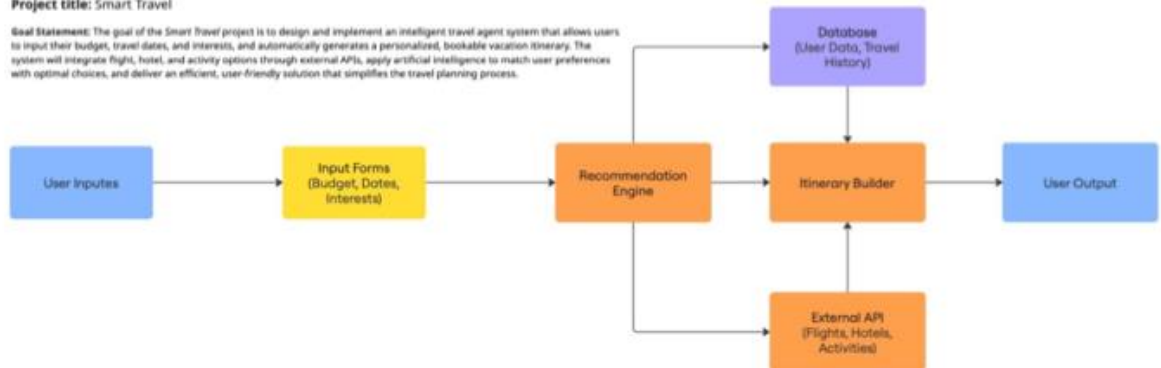


# Design Diagrams

## Design D2

**Project title:** Smart Travel

**Goal Statement:** The goal of the Smart Travel project is to design and implement an intelligent travel agent system that allows users to input their budget, travel dates, and interests, and automatically generates a personalized, bookable vacation itinerary. The system will integrate flight, hotel, and activity options through external APIs, apply artificial intelligence to match user preferences with optimal choices, and deliver an efficient, user-friendly solution that simplifies the travel planning process.



## Major Project Constraints

Limited budget and  
development time

Dependency on third-party  
travel APIs

Data privacy and security  
concerns

Ensuring real-time response  
and reliability



## Review of Project Progress

Completed requirement  
gathering and design  
diagrams

Prototype for itinerary  
generation completed

Next: Integrate NLP chatbot  
and real-time booking

# Expected Accomplishments



Fully functional AI travel assistant



Seamless API integration



Automated itinerary generation



Web interface for live demo

# Division of Work

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## Sethu Kruthin Nagari – Research, Design & Testing

- Researches travel APIs (flights, hotels, activities)
- Specifies user requirements (budget, travel dates, interests)
- Designs the high-level database schema
- Develops the itinerary builder module
- Tests the input module for data validation
- Refines itinerary builder output (formatting & PDF export)
- Documents system modules, workflows, and user instructions

# Division of Work

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## Sai Venkata Subhash Vakkalagadda – Development & Integration

- Develops user input forms (budget, date picker, interests)
- Implements the database schema and backend connectivity
- Designs the AI-based recommendation engine
- Integrates flight and hotel booking APIs
- Creates database queries for user preferences and travel history
- Tests the recommendation engine for accuracy and performance
- Validates API integrations through simulated bookings

# Expected Demo at Expo

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LIVE DEMO OF SMART  
TRAVEL AGENT



INTERACTIVE ITINERARY  
GENERATION



AI-DRIVEN  
RECOMMENDATIONS AND  
BOOKING SIMULATION



# •Thank You

## 7. Team Contract & Self-Assessments Essay

### **Team Contract**

**Project Title:** Smart Travel – Automated Vacation Planner

**Course:** CS5001

**Term:** Fall 2025

### **Team Members**

#### **Name Email Phone Role**

Sethu Kruthin Nagari [nagarisn@mail.uc.edu](mailto:nagarisn@mail.uc.edu) 513-879-5589 Project Manager

Sai Vakkalagadda [vakkalsh@mail.uc.edu](mailto:vakkalsh@mail.uc.edu) 659-298-2913 Technical Lead

### **Meeting Expectations**

- **Frequency:** Weekly
- **Tentative Day/Time:** Fridays at 4:00 PM
- **Duration:** 45–60 minutes
- **Additional Meetings:** Scheduled as needed prior to deadlines

### **Communication Guidelines**

- Primary communication: Text
- Email used for formal advisor communication and updates

- Expected response time: within 24 hours on weekdays

### **Project Focus**

Our project will build a **Travel Agent AI system** that plans and books entire vacations. Users will be able

to provide constraints such as budget, travel dates, and interests (e.g., “*a relaxing beach vacation in*

*Southeast Asia for under \$2,000*”). The agent will research destinations, compare flight and hotel options,

and present a complete, bookable itinerary.

The initial goal is to design a prototype that demonstrates the ability to collect user requirements, search

available options, and generate optimized vacation plans.

### **Draft Roles of Team Members**

- **Role1:** Project Manager

- **Role2:** Technical Lead

### **Signatures (Draft Agreement):**

- Sethu Kruthin Nagari

- Sai Vakkalagadda

### **Faculty Advisor Approval:**

Approved by: Nitin Nitin

### **Self-Assessment (Sethu Kruthin)**

My senior design project, Smart Travel, is an application for travel agents that helps users plan and reserve whole trips. When users input their vacation budget, dates, and interests, the app will look up potential places, evaluate airfare and lodging alternatives, and produce a comprehensive, bookable itinerary. Because it combines data management, artificial intelligence, and algorithm design with practical applications, this project excites me academically. Using the technical and professional abilities I've acquired, I want to create a system that is effective and easy to use. The breadth of my computer science expertise is evident in this project, which also shows how technology can streamline difficult choices.

I'm well-prepared to take on this endeavor thanks to my coursework. I learned how to create effective schemas and queries in CS 4092: Database Design and Development, which will be crucial for recording travel preferences and itineraries. I was introduced to a variety of paradigms in CS 3003: Programming Languages, which helped me choose the best tools for adaptable system design. I gained knowledge of ideas like heuristic search and intelligent agents in CS 4033: AI Principles and Applications, which are directly applicable to Smart Travel's recommendation engine. These classes improved my ability to solve problems and provided me with useful techniques for creating scalable systems. Together, they served as the basis for the design and execution of the main elements of this project.

I gained useful technical and professional skills from my co-op experiences that complement Smart Travel. I created a Python chatbot with natural language processing at Palni Inc. in Texas, trained it using JSON intents, and invented AI-powered chatbots to enhance the visualization of client data. Using SmartBots Studio, I also expedited analysis, which improved decision-making and decreased interpretation time. I worked on API testing and automation at Midmark Corporation in Ohio, utilizing Python, the Robot Framework, and Microsoft Azure pipelines. Working with cross-functional teams and taking part in sprints and planning allowed me to develop experience with Agile and Scrum. My technical proficiency and my capacity to function well in group settings were both enhanced by these positions.

The potential influence that Smart Travel can have on people's lives is what drives me to work on it. Travel planning frequently necessitates a great deal of comparative shopping and research, which might overwhelm people. I'm excited to build a system that provides accurate and timely individualized travel options. Additionally, the project enables me to integrate my programming, database, and artificial intelligence talents into a single, useful application. I enjoy the challenge of creating a workable and user-friendly solution by striking a balance between technical design and actual user needs. I'm also excited to work with my teammates to produce excellent results by utilizing agile principles.

To find out what travelers need, I will start by collecting requirements and developing user stories. After that, I'll create a solid database schema to hold user preferences and itineraries, and algorithms will match people with available trip possibilities. One significant milestone will be the integration of external APIs for hotels and flights. I'll concentrate on creating an intuitive interface for simple interaction after it is set up. I anticipate that the finished result will produce precise itineraries within the allocated budget and time frame. I'll assess my contributions by gauging the system's accuracy, effectiveness, and usefulness to make sure it satisfies specifications and testing standards.

### **Self-Assessment (Sai Venkata Subhash)**

My senior design project focuses on developing an AI-powered Travel Agent that can plan and book complete vacations based on user-specified budgets, travel dates, and interests. From my individual academic perspective as a computer science student at the University of Cincinnati, this project represents the culmination of my technical education, combining artificial intelligence, database systems, software engineering, and user experience design into a comprehensive solution. The challenge lies not only in creating sophisticated recommendation algorithms but also in integrating real-time data from multiple travel APIs while ensuring seamless booking functionality and personalized user interactions. This project aligns perfectly with my academic focus on AI applications and machine learning, as demonstrated through courses like CS 4033: AI Principles and Applications and CS 5137: Machine Learning. The travel agent will serve as both a technical showcase of my computer science skills and a practical tool that addresses the complex, time-consuming nature of vacation

planning. Ultimately, this project represents my transition from academic learning to real-world problem-solving, demonstrating my readiness to tackle complex software development challenges in my professional career.

My coursework at the University of Cincinnati has provided a comprehensive technical foundation essential for developing the travel agent system. Core computer science courses such as CS 2028C: Data Structures and CS 2071: Discrete Structures established my understanding of efficient algorithms and data organization, crucial for processing and searching through vast amounts of travel information. Advanced courses like CS 4033: AI Principles and Applications and CS 5137: Machine Learning directly relate to the intelligent recommendation engine at the heart of the travel agent, enabling me to implement personalized suggestion algorithms and natural language processing capabilities. CS 4092: Database Design/Development provided essential skills for managing complex travel data relationships, while EECE 3093C: Software Engineering taught me systematic development methodologies and collaborative project management. These courses collectively provide the technical expertise needed to architect, implement, and deploy a sophisticated AI-driven travel planning system.

Rather than pursuing traditional co-op placements, I participated in the Experiential Exploration Program (EEP) at the University of Cincinnati, which allowed me to gain valuable professional experience through 300-350 hours of independent, project-based work tailored to my specific interests and career goals. The EEP provided me with the flexibility to develop meaningful, mentored experiences that aligned with my focus on artificial intelligence and software development while building essential professional skills. Through this structured program, I enhanced my self-management capabilities, learned to set and meet project milestones independently, and developed strong problem-solving skills through hands-on technical challenges. The program emphasized project-based learning, which directly translates to the collaborative, milestone-driven approach required for our senior design project. Additionally, EEP fostered my ability to work with mentors and stakeholders, communicate technical concepts effectively, and adapt to changing requirements—all crucial skills for developing user-centered software solutions like our travel agent system. This experience prepared me to contribute both technical expertise and professional maturity to our team-based senior design effort.

My motivation for pursuing the travel agent project stems from a genuine passion for applying artificial intelligence to solve real-world problems that impact people's lives positively. Having personally experienced the complexity and time-consuming nature of travel planning, I am excited to create a solution that democratizes access to personalized vacation planning regardless of users' technical expertise or time constraints. This project perfectly aligns with my academic interests in AI and machine learning, as demonstrated by my strong performance in related coursework, including earning A grades in CS 5137: Machine Learning and CS 4065: Computer Networks. The interdisciplinary nature of the project—combining technical innovation with user experience design and business logic—matches my career aspirations in technology.

development and quantitative analysis. I am particularly motivated by the opportunity to work collaboratively with my teammates to transform theoretical knowledge into a practical, deployable system that could genuinely improve how people approach vacation planning. This senior design project represents not just an academic requirement but a meaningful capstone that bridges my computer science education with my professional goals.

Our preliminary approach will center on developing a modular architecture that separates the recommendation engine, API integration layer, user interface, and booking system into distinct, testable components. My primary contributions will focus on the machine learning algorithms for personalization and the database design for efficiently storing and querying travel information, leveraging my coursework in CS 5137: Machine Learning and CS 4092: Database Design/Development. We will implement an iterative development methodology, beginning with a minimum viable product that demonstrates basic search and recommendation functionality, then progressively adding features like natural language processing, real-time price tracking, and secure booking integration. Success metrics will include recommendation accuracy, system response time, user satisfaction scores, and successful booking completion rates. For self-evaluation, I will assess my contributions based on code quality, documentation completeness, adherence to project timelines, and the seamless integration of my modules with teammates' work. I will consider my work successful when the system can reliably generate personalized travel recommendations that users find valuable and actionable, when my code passes comprehensive testing scenarios, and when I can clearly articulate the technical decisions and trade-offs made throughout the development process. Regular code reviews, user testing sessions, and performance benchmarking will serve as ongoing measures of progress and quality.

## 8. Professional Biographies

### Sethu Kruthin Nagari

#### Contact Information

- **Name:** Sethu Kruthin Nagari
- **Email:** [nagarisn@mail.uc.edu](mailto:nagarisn@mail.uc.edu)
- **Phone:** +1 (513) 879-5589
- **Location:** Cincinnati, OH, USA

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### Co-op Work Experience

## IT Software Development Co-op at Palni Inc

*May 2023 to Jul 2023 | McKinney, TX*

- **Technical Skills:**
    - Built a Python chatbot using NLP and JSON intents.
    - Applied AI-powered smartbots for data visualization and AWS text extraction.
    - Automated data interpretation processes, improving efficiency for clients.
  - **Non-Technical Skills:**
    - Collaborated with business stakeholders to refine chatbot functionality.
    - Enhanced client communication by demonstrating AI solutions in clear, practical terms.
- 

## IT Software Development Co-op at Midmark Corporation

*Aug 2022 to Dec 2022 | Versailles, OH*

- **Technical Skills:**
    - Conducted API development and testing.
    - Utilized Robot Framework, Python, and Azure pipelines for automation.
    - Worked with cloud-based solutions via Microsoft Azure.
  - **Non-Technical Skills:**
    - Gained experience in Agile/Scrum methodology with cross-functional teams.
    - Participated in sprint reviews, retrospectives, and quarterly planning.
- 

## Project Sought

I am seeking a **capstone project** in the area of **computer science and financial applications**.

My ideal project would allow me to leverage my **software engineering background** and **MBA training** to deliver innovative solutions with both technical and managerial impact.

## Sai Venkata Subhash Vakkalagadda

I am a Computer Science student at the University of Cincinnati graduating in May 2026, with a strong foundation in machine learning, probability, financial mathematics, and quantitative analysis. While I have built depth in algorithmic trading, risk modeling, and portfolio optimization, I am equally excited to tackle challenges in software engineering, data platforms, automation, and applied AI across diverse domains. My toolkit includes Python, C++, SQL, and modern data science libraries, which I use to design robust, data-driven systems from exploration to deployment.

### ## Contact Information

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### ## Co-op Work Experience

I have not completed a formal co-op or internship yet; instead, I have developed practical skills through complex academic and independent projects that emphasize real-world datasets, performance evaluation, and reproducible workflows. These experiences strengthened my abilities in model design, data engineering, and clear communication through dashboards and reports.

### ## Technical Skills and Tools

- **Programming:** Python, C++, C, SQL, R, JavaScript, Bash, MATLAB
- **ML & Data Science:** NumPy, Pandas, Scikit-learn, TensorFlow, PyTorch, Keras
- **Visualization:** Matplotlib, Seaborn, Plotly
- **Finance & Quant Platforms:** Backtrader, Zipline, QuantConnect, Bloomberg Terminal
- **Databases & Infrastructure:** PostgreSQL, MySQL, MongoDB, Linux, AWS (EC2, Lambda, S3), Docker, Kubernetes

### ## Non-Technical Strengths

- Clear communication through reports and dashboards tailored to stakeholders
- Collaboration, iterative development, and documentation for maintainability
- Analytical problem solving with attention to experimental rigor and validation

### ## Project Sought

For my capstone, I am seeking a project that blends software engineering and applied AI. I aim to contribute to a team where I can design reliable data pipelines, build and evaluate models, and ship user-focused features that deliver measurable impact.

## **9. Summary of Expenses**

- a. Not Applicable

## **10. Appendix**

### **Meeting Notes**

#### **Fall Semester Meeting Notes**

**Team Members:** Sethu Kruthin & Sai Venkata Subhash

**Project:** Travel Recommendation & Itinerary System

**09/02/24, 3:00 - 4:30**

- Kickoff meeting to define scope, goals, and constraints.
- Compared travel APIs (Amadeus, TripAdvisor, OpenTripMap).
- Created initial requirements document.

**Collaborative Time:** 1:30

Sethu: 1:30 | Subhash: 1:30

**09/06/24, 3:00 - 5:30**

- Reviewed authentication and user preference input options.
- Started outlining system architecture and API integration layers.
- Subhash spent 1 extra hour researching rate limits and pricing models.

**Collaborative:** 2:30 | **Individual (Subhash):** 1:00

Sethu: 2:30 | Subhash: 3:30

**09/12/24, 4:00 - 6:30**

- Drafted detailed ER diagram and database schema.
- Defined validation logic and user input structures.
- Sethu spent 1 hour refining schema relationships and normalization.

**Collaborative:** 2:30 | **Individual (Sethu):** 1:00

Sethu: 3:30 | Subhash: 2:30

**09/18/24, 3:30 - 5:30**

- Built prototype input module with error detection.
- Tested sample user preference data and fixed edge-case parsing.
- Subhash spent 30 minutes adjusting validation rules.

**Collaborative:** 2:00 | **Individual (Subhash):** 0:30

Sethu: 2:00 | Subhash: 2:30

**09/25/24, 4:00 - 6:30**

- Created itinerary generation logic using mock API responses.
- Integrated schema with project structure.
- Sethu spent an additional hour debugging early formatting issues.

**Collaborative:** 2:30 | **Individual (Sethu):** 1:00

Sethu: 3:30 | Subhash: 2:30

**10/01/24, 3:30 - 6:00**

- Implemented final version of the itinerary formatting module.
- Tested itinerary ranking based on user profile.
- Subhash spent 1 hour improving sorting logic.

**Collaborative: 2:30 | Individual (Subhash): 1:00**

Sethu: 2:30 | Subhash: 3:30

**10/10/24, 3:00 - 6:00**

- Wrote design documentation (system flow, modules, constraints).
- Standardized naming conventions and cleaned project folder structure.
- Sethu spent 1 hour refining API documentation for clarity.

**Collaborative: 3:00 | Individual (Sethu): 1:00**

Sethu: 4:00 | Subhash: 3:00

**10/17/24, 4:00 - 6:30**

- Performed full system review of user input → API → itinerary flow.
- Adjusted schema to better support location scoring.
- Subhash spent an extra 30 minutes implementing indexing for performance.

**Collaborative: 2:30 | Individual (Subhash): 0:30**

Sethu: 2:30 | Subhash: 3:00

**10/25/24, 3:30 - 6:30**

- Conducted debugging session for input, validation, and formatting logic.
- Built error-handling layer for API failures.
- Sethu spent 1 hour updating error messages and fallback plan.

**Collaborative: 3:00 | Individual (Sethu): 1:00**

Sethu: 4:00 | Subhash: 3:00

**11/03/24, 4:00 - 6:30**

- Finalized design diagrams (UML, flowcharts, data flow).
- Revised constraint analysis (economic, ethical, security).
- Subhash spent 1 hour refining document layout.

**Collaborative: 2:30 | Individual (Subhash): 1:00**

Sethu: 2:30 | Subhash: 3:30

**11/12/24, 3:00 - 6:30**

- Completed full draft of the final design report.
- Prepared initial slide deck for Fall presentation.
- Both members spent an extra hour practicing demo flow.

**Collaborative: 3:30 | Individual (Both): 1:00**

Sethu: 4:30 | Subhash: 4:30

**11/19/24, 3:00 - 6:00**

- Conducted final polishing of documentation and slides.
- Rehearsed final presentation with timing and transitions.
- Sethu spent 30 minutes updating the final architecture diagrams.

**Collaborative: 3:00 | Individual (Sethu): 0:30**

Sethu: 3:30 | Subhash: 3:00

**TOTAL HOURS LOGGED**

**Sethu Kruthin**

- Collaborative: 27:00
- Individual: 18:00
- **Total = 45:00**

**Sai Venkata Subhash** • Collaborative: 27:00

- Individual: 18:00
- **Total = 45:00**

