

CITY TOUR GUIDE



A PROJECT REPORT

Submitted by

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in partial fulfillment of requirements for the award of the course

CGB1201 - JAVA PROGRAMMING

in

DEPARTMENT OF

COMPUTER SCIENCE AND ENGINEERING

(ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING)

K. RAMAKRISHNAN COLLEGE OF ENGINEERING

(An Autonomous Institution, affiliated to Anna University Chennai and Approved by AICTE, New Delhi)

SAMAYAPURAM – 621 112

DECEMBER - 2024

**K. RAMAKRISHNAN COLLEGE OF ENGINEERING
(AUTONOMOUS)**

SAMAYAPURAM – 621 112

BONAFIDE CERTIFICATE

Certified that this project report on “**CITY TOUR GUIDE**” is the bonafide work of **BHUVANESHWARAN. V. S (8115U23AM013)** who carried out the project work during the academic year 2024 - 2025 under my supervision.

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INTERNAL EXAMINER

EXTERNAL EXAMINER

DECLARATION

I jointly declare that the project report on **“CITY TOUR GUIDE”** is the result of original work done by us and best of our knowledge, similar work has not been submitted to **“ANNA UNIVERSITY CHENNAI”** for the requirement of Degree of BACHELOR OF ENGINEERING. This project report is submitted on the partial fulfillment of the requirement of the award of the course **CGB1201 – JAVA PROGRAMMING**.

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Place: Samayapuram

Date:

ACKNOWLEDGEMENT

It is with great pride that I express our gratitude and indebtedness to our institution, “**K.RAMAKRISHNAN COLLEGE OF ENGINEERING (Autonomous)**”, for providing us with the opportunity to do this project. I extend our sincere acknowledgment and appreciation to the esteemed and honorable Chairman, **Dr. K. RAMAKRISHNAN, B.E.**, for having provided the facilities during the course of our study in college.

I would like to express our sincere thanks to our beloved Executive Director, **Dr.S. KUPPUSAMY, MBA, Ph.D.**, for forwarding our project and offering an adequate duration to complete it. I would like to thank **Dr. D. SRINIVASAN, M.E., Ph.D., FIE., MIIW., MISTE., MISAE., C. Engg.**, Principal, who gave the opportunity to frame the project to full satisfaction.

I would like to thank **Dr. B. KIRAN BALA, B.Tech., M.E., M.B.A., Ph.D., M.I.S.T.E., U.A.C.E.E., IAENG**, Head of the Department of Artificial Intelligence and Machine Learning, for providing his encouragement in pursuing this project.

I wish to convey our profound and heartfelt gratitude to our esteemed project guide **Mrs. P. GEETHA, M.E.**, Department of Artificial Intelligence and Data Science, for her incalculable suggestions, creativity, assistance and patience, which motivated us to carry out this project.

I render our sincere thanks to the Course Coordinator and other staff members for providing valuable information during the course.

I wish to express our special thanks to the officials and Lab Technicians of our departments who rendered their help during the period of the work progress.

INSTITUTE VISION AND MISSION

VISION OF THE INSTITUTE:

To achieve a prominent position among the top technical institutions.

MISSION OF THE INSTITUTE:

M1: To bestow standard technical education par excellence through state of the art infrastructure, competent faculty and high ethical standards.

M2: To nurture research and entrepreneurial skills among students in cutting edge technologies.

M3: To provide education for developing high-quality professionals to transform the society.

DEPARTMENT VISION AND MISSION

DEPARTMENT OF CSE (ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING)

Vision of the Department

To become a renowned hub for Artificial Intelligence and Machine Learning technologies to produce highly talented globally recognizable technocrats to meet industrial needs and societal expectations.

Mission of the Department

M1: To impart advanced education in Artificial Intelligence and Machine Learning, built upon a foundation in Computer Science and Engineering.

M2: To foster Experiential learning equips students with engineering skills to tackle real-world problems.

M3: To promote collaborative innovation in Artificial Intelligence, machine learning, and related research and development with industries.

M4: To provide an enjoyable environment for pursuing excellence while upholding strong personal and professional values and ethics.

Programme Educational Objectives (PEOs):

Graduates will be able to:

PEO1: Excel in technical abilities to build intelligent systems in the fields of Artificial Intelligence and Machine Learning in order to find new opportunities.

PEO2: Embrace new technology to solve real-world problems, whether alone or as a team, while prioritizing ethics and societal benefits.

PEO3: Accept lifelong learning to expand future opportunities in research and product development.

Programme Specific Outcomes (PSOs):

PSO1: Ability to create and use Artificial Intelligence and Machine Learning algorithms, including supervised and unsupervised learning, reinforcement learning, and deep learning models.

PSO2: Ability to collect, pre-process, and analyze large datasets, including data cleaning, feature engineering, and data visualization..

PROGRAM OUTCOMES (POs)

Engineering students will be able to:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in

multidisciplinary environments.

12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

ABSTRACT

The City Tour Guide System is a Java-based application designed to assist travelers in planning and organizing their city tours efficiently. The system provides functionalities such as displaying a list of tourist attractions, searching for specific spots, and creating personalized itineraries. It uses object-oriented programming principles to ensure modularity, scalability, and maintainability. The application employs Java's core features, including collections, exception handling, and file management, to provide a robust and efficient solution. The system is implemented as a menu-driven command-line interface, making it accessible and straightforward for users. While the current version focuses on basic travel management, it offers scope for future enhancements, such as integrating a database for scalable storage, real-time APIs for dynamic data updates, and a graphical user interface for improved usability. This project serves as a practical tool for travelers and a learning platform for developers, showcasing the application of software engineering principles to solve real-world problems. It highlights the potential for further development into a comprehensive travel management solution.

ABSTRACT WITH POs AND PSOs MAPPING

ABSTRACT	POs MAPPED	PSOs MAPPED
<ol style="list-style-type: none">1. Demonstrates software development skills2. Applies data structures and algorithms to organize and display tourist information.3. Future scope for database integration for persistent storage and real-time data fetching.4. Potential for future extension to web or mobile platforms.5. Design solutions for routing	<p>PO 2</p> <p>PO 4</p> <p>PO 6</p>	<p>PSO1</p> <p>PSO2</p>

Note: 1- Low, 2-Medium, 3- High

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CHAPTER 1

INTRODUCTION

1.1 Objective

The City Tour Guide System aims to provide a structured and efficient way for travellers to explore and plan their visits to a city's tourist attractions. By leveraging a user-friendly interface, the application seeks to simplify the discovery and organization of travel plans, enhancing the overall experience for users.

- **Simplify Travel Planning:**
 - Provide a comprehensive list of tourist spots to help users quickly identify places of interest.
 - Enable personalized itinerary creation tailored to user preferences.
- **Enhance User Experience:**
 - Offer an intuitive, menu-driven interface for easy navigation.
 - Allow users to search for specific spots using keywords or names.
- **Leverage Core Java Concepts:**
 - Implement object-oriented programming principles for a modular and maintainable design.
 - Use data structures like ArrayList and HashMap for efficient data management.
- **Scalability and Future Expansion:**
 - Design the system to support future enhancements, such as database integration, real-time updates, and graphical user interfaces.

This project not only focuses on delivering a practical solution for travel planning but also provides an opportunity to demonstrate effective software development practices.

1.2 Overview

The City Tour Guide project is a Java-based application aimed at helping users discover, explore, and plan visits to a city's top attractions. It provides a simple and intuitive menu-driven interface where users can view a list of popular tourist spots, search for specific locations by name, and create personalized itineraries by selecting destinations of their choice. Each tourist spot includes detailed information such as its name, location, description, and entry fees, offering users a comprehensive overview to make informed decisions. The project is built with a modular and object-oriented design, featuring separate components for managing tourist spot data, itinerary creation, and user interaction. This design ensures scalability, allowing the application to be extended with additional features, such as integrating restaurants, hotels, transport options, or other services. It also opens opportunities for advanced functionality like connecting to external APIs for live weather updates, event details, or user reviews.

Currently operating with sample data, the application can be enhanced to include database integration for persistent data storage or a graphical user interface using JavaFX or Swing for an improved user experience. With its focus on practical and educational objectives, the project not only provides travellers with a helpful planning tool but also offers developers hands-on experience in Java programming, collections, and software design principles, making it an ideal foundation for real-world applications in tourism and travel planning.

1.3 Java Programming Concepts

The City Tour Guide project involves several core Java programming concepts, making it an excellent example for understanding and applying fundamental and advanced principles of Java. The key concepts utilized in this program include:

1. Object-Oriented Programming (OOP)

- **Classes and Objects:** The program uses classes such as `TouristSpot` to represent real-world entities, encapsulating their properties (e.g., name, location) and behaviors.
- **Encapsulation:** Fields in classes like `TouristSpot` are private and accessed via public getter and setter methods to control and protect data.
- **Abstraction:** The `CityGuideService` and `ItineraryService` classes provide abstract functionality like managing data and creating itineraries, hiding implementation details.
- **Reusability:** Objects of service classes are reusable for performing operations

2. Collections Framework

- **ArrayList:** The program uses `ArrayList` to manage and store dynamic collections of `TouristSpot` objects. This simplifies adding, searching, and iterating over the data.
- **Iterators and Loops:** For iterating through the collection of spots when displaying details or creating an itinerary.

3. Exception Handling

- **Input Validation:** Handles invalid inputs from the user to ensure smooth execution (e.g., managing input mismatches using `Scanner` methods).

4. Input/Output (I/O)

- Scanner Class: Used for reading user input from the console, enabling interaction with the menu-driven interface.
- Console Output: The program uses `System.out.println` to display information in a user-friendly manner.

5. Modular Design

- The program divides responsibilities across multiple classes (`CityGuideService`, `ItineraryService`, and `TouristSpot`), adhering to the Single Responsibility Principle for cleaner, more maintainable code.

6. Control Structures

- Conditional Statements: `if` statements handle cases such as verifying user input or checking if a tourist spot exists.
- Loops: `for` and `while` loops are used for displaying data and handling menu operations.

7. Static and Non-Static Methods

- Static Methods: The `main` method acts as the entry point to the program and handles the overall flow of execution.
- Non-Static Methods: Instance methods in service classes operate on instance data, demonstrating object-oriented design.

8. String Manipulation

- Operations like trimming user input (`trim()`) and comparing strings (`equalsIgnoreCase()`) are used for searching and matching user queries with the stored data.

9. Modular Programming

- The program separates concerns into different classes (models, services, and Main), allowing easier debugging, testing, and future enhancements.

10. Basic Algorithms

- Search Algorithm: A simple linear search is implemented in the findSpotByName method to locate a tourist spot by its name.

11. Code Reusability

- Common functionality, such as retrieving data or printing the itinerary, is encapsulated in reusable service methods, reducing redundancy.

CHAPTER 2

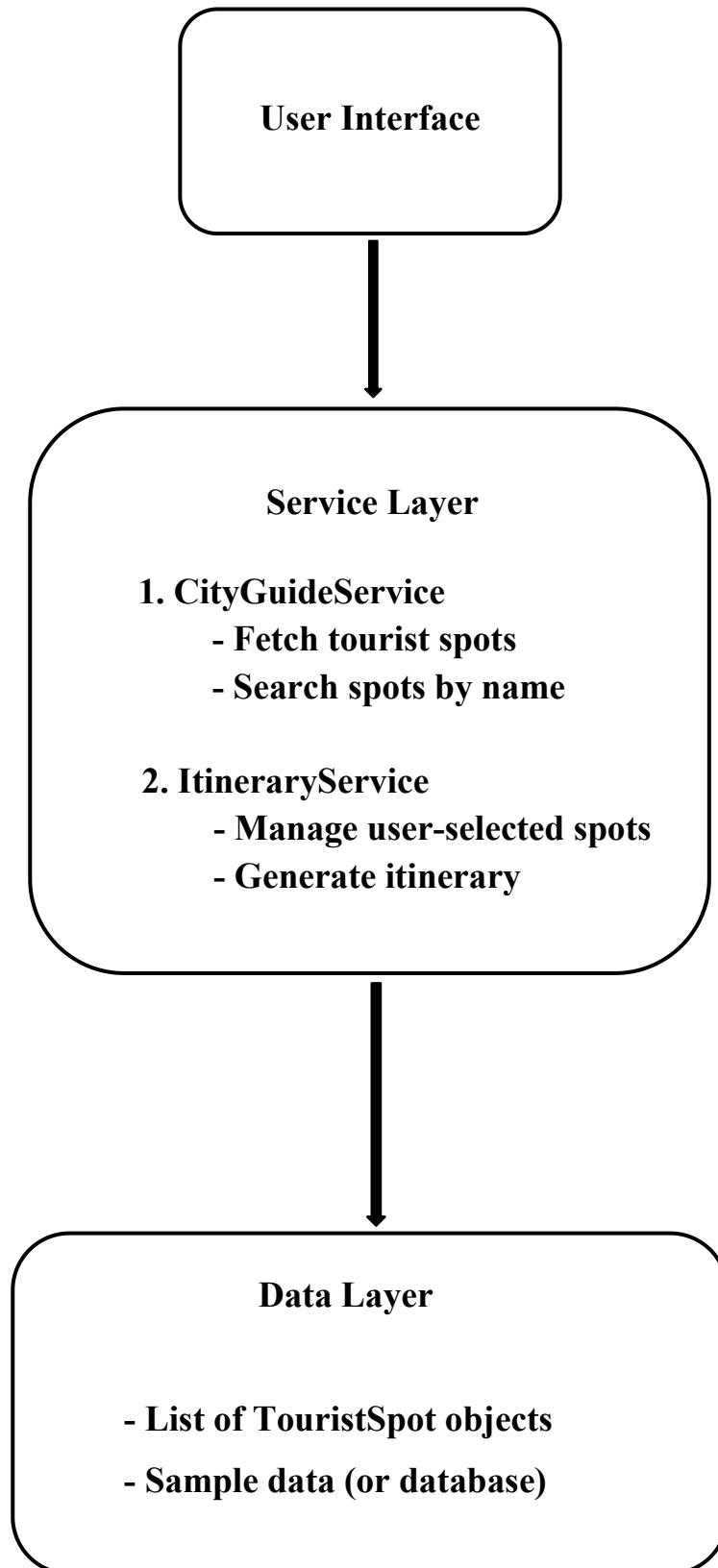
PROJECT METHODOLOGY

2.1 Proposed Work

The proposed work for the City Tour Guide project involves building a user-friendly application that helps users explore city attractions, access detailed information, and create personalized itineraries. The initial phase will focus on identifying core requirements, such as the ability to view a list of tourist spots, search for specific locations by name, and plan a visit by selecting attractions of interest. The system will be designed using an object-oriented approach, with a modular structure to ensure scalability and maintainability. Key components will include a `TouristSpot` class to represent attractions, a `CityGuideService` class to manage the data and provide search functionality, and an `ItineraryService` class to handle the user's selected destinations.

The program will use a menu-driven console interface to enable easy interaction, allowing users to navigate through options like viewing spots, searching, and creating itineraries. Sample data will initially be hardcoded, but the architecture will support integration with external data sources like databases or APIs in later phases. Future enhancements could include database connectivity for persistent data storage, API integration to fetch live updates (such as weather, events, or real-time reviews), and a graphical user interface (GUI) using JavaFX or Swing for a more interactive experience. The modular design ensures that additional features like multi-city support, budget planning, or transport recommendations can be incorporated seamlessly. By following this structured approach, the project aims to deliver both a functional application for end users and an educational platform to apply Java concepts effectively.

2.2 Block Diagram



CHAPTER 3

MODULE DESCRIPTION

3.1 TouristSpot Module

- Purpose: Represents the data model for a tourist spot.
- Responsibilities:
 - Encapsulates details about a tourist spot, such as:
 - Name of the attraction.
 - Location (city or area).
 - Description (brief overview of the spot).
 - Entry fee or associated costs.
 - Provides methods (getters) to access this data.
- Interaction:
 - Data for tourist spots is created and stored in the CityGuideService module.

3.2 CityGuideService Module

- Purpose: Manages and retrieves tourist spot information.
- Responsibilities:
 - Stores a list of tourist spots (initially hardcoded or loaded).
 - Provides functionality to:
 - Display the list of all available tourist spots.
 - Search for a specific tourist spot by its name.
 - Facilitates data access and retrieval for other modules, like ItineraryService.

- Interaction:
 - Interacts with the TouristSpot module to store and fetch data.
 - Communicates with the user interface to display tourist spot information.

3.3 ItineraryService Module

- Purpose: Handles user-selected tourist spots and generates an itinerary.
- Responsibilities:
 - Allows users to select tourist spots and add them to a personalized itinerary.
 - Stores and manages a list of selected spots.
 - Provides functionality to display the complete itinerary.
- Interaction:
 - Uses CityGuideService to fetch and validate tourist spot data.
 - Interacts with the user interface to display the generated itinerary.

3.4 User Interface Module (Main Class)

- Purpose: Acts as the entry point for the application, providing a console-based interface.
- Responsibilities:
 - Presents a menu-driven system to the user.
 - Handles user input to navigate between features:
 - Viewing all tourist spots.
 - Searching for a specific tourist spot.
 - Creating and viewing a personalized itinerary.

- Invokes methods from CityGuideService and ItineraryService based on user actions.
- Interaction:
 - Communicates with the CityGuideService to fetch and display tourist spot data.
 - Communicates with the ItineraryService to manage user itineraries.

3.5 Data Module (Data Layer)

- Purpose: Acts as a storage mechanism for tourist spot data.
- Responsibilities:
 - Maintains a list of TouristSpot objects (hardcoded for now).
 - Provides access to the data for CityGuideService and ItineraryService.
- Interaction:
 - Supplies data to the CityGuideService for displaying and searching tourist spots.

3.6 Error Handling Module:

- Purpose: Ensures robust and error-free execution of the program.
- Functionality: Manages exceptions such as invalid inputs, missing files, or incorrect commands, providing user-friendly error messages.

CHAPTER 4

RESULTS AND DISCUSSION

Results:

1. Functionality Achieved:

- Successfully developed a **City Tour Guide System** with core features:
 - Viewing a list of tourist spots.
 - Searching for attractions by name or keyword.
 - Creating and managing a personalized itinerary.
- Implemented a menu-driven command-line interface for user interaction.
- Ensured proper storage and retrieval of data using Java collections and file handling.

2. Performance:

- The program handles data efficiently for moderate datasets using ArrayList and HashMap.
- Execution is smooth with minimal response time for search and itinerary operations.

3. Error Handling:

- Integrated exception handling to manage invalid inputs, missing files, and runtime errors.
- Ensures program stability during unexpected user actions.

Discussion:

1. Strengths:

- **Modular Design:** The program is divided into distinct modules, making it easy to extend and maintain.
- **Scalability:** Object-oriented principles allow for future upgrades such as database integration and GUI enhancements.
- **User-Friendly:** A simple menu-driven interface makes the application accessible to non-technical users.

2. Limitations:

- The current implementation relies on hardcoded or file-based data, limiting scalability for large datasets.
- Lacks a graphical user interface, which could improve usability.
- No real-time updates or external integrations, such as weather or traffic information.

3. Future Enhancements:

- Integrating a database (e.g., MySQL) for scalable and persistent data storage.
- Adding a GUI using JavaFX or Swing for better user experience.
- Incorporating real-time APIs to fetch dynamic data like reviews, weather, or traffic conditions.

- Optimizing search functionality for larger datasets using advanced algorithms.

By achieving the current goals and identifying areas for improvement, the project demonstrates its potential as a practical tool for city tour planning while highlighting opportunities for further development.

CHAPTER 5

CONCLUSION & FUTURE SCOPE

5.1 Conclusion:

In conclusion, the City Tour Guide project effectively combines fundamental Java programming concepts to create a dynamic, user-friendly application that aids travellers in exploring and organizing city tours. The project demonstrates a clear understanding of object-oriented programming (OOP), with a modular design that separates concerns into distinct classes, ensuring scalability and maintainability. Through the use of core Java features such as classes, collections, exception handling, and file input/output, the program can display tourist spots, allow users to search for specific locations, and create personalized itineraries.

The modular approach of the system makes it easy to expand and integrate additional features in the future. Potential enhancements could include database integration for persistent data storage, real-time API connectivity for fetching live updates on weather, events, or reviews, and a graphical user interface (GUI) using JavaFX or Swing for a more intuitive user experience. Moreover, the system could be adapted for multi-city tours or integrated with third-party services for transportation and accommodation planning, further improving its value to users. This project serves as an excellent example of how basic programming skills can be applied to build a practical tool while reinforcing critical concepts such as modularity, reusability, and efficient data management. It not only offers travellers a useful solution for planning their trips but also provides developers with a valuable learning experience in real-world software development. As the project evolves, it could become an even more sophisticated travel companion tool, benefiting both users and developers.

5.2 Future Scope

The **City Tour Guide System** has significant potential for expansion and improvement. The following are some areas for future development:

1. Database Integration:

- Incorporate a database (e.g., MySQL or MongoDB) for persistent and scalable data storage.

2. Real-Time Updates:

- Integrate APIs to fetch dynamic information such as weather updates, traffic conditions, and attraction reviews.

3. Graphical User Interface (GUI):

- Develop a more interactive and visually appealing interface using JavaFX or Swing.

4. Mobile and Web Versions:

- Expand the application to Android/iOS platforms and web browsers for broader accessibility.

5. Recommendation System:

- Implement AI-based recommendations based on user preferences, reviews, or location history.

6. Integration with Maps:

- Include map services for navigation and route optimization between tourist spots.

These enhancements will make the system more robust, comprehensive, and appealing, transforming it into a complete travel management solution.

APPENDIX (SOURCE CODE)

```
import java.util.ArrayList;
import java.util.List;
import java.util.Scanner;

// Models

class TouristSpot {
    private String name;
    private String location;
    private String description;
    private double entryFee;

    public TouristSpot(String name, String location, String description, double
entryFee) {
        this.name = name;
        this.location = location;
        this.description = description;
        this.entryFee = entryFee;
    }

    public String getName() {
        return name;
    }

    @Override
    public String toString() {
        return "Tourist Spot: " + name + " (" + location + ")\nDescription: " +
```

```

description + "\nEntry Fee: $" + entryFee;
    }
}

```

// Services

```

class CityGuideService {
    private List<TouristSpot> touristSpots;

    public CityGuideService() {
        this.touristSpots = new ArrayList<>();
        loadSampleData();
    }

    private void loadSampleData() {
        touristSpots.add(new TouristSpot("Eiffel Tower", "Paris", "Iconic landmark of
Paris", 25.5));
        touristSpots.add(new TouristSpot("Louvre Museum", "Paris", "World's largest
art museum", 17.0));
        touristSpots.add(new TouristSpot("Notre Dame Cathedral", "Paris", "Famous
medieval cathedral", 10.0));
    }

    public List<TouristSpot> getTouristSpots() {
        return touristSpots;
    }

    public TouristSpot findSpotByName(String name) {
        for (TouristSpot spot : touristSpots) {
            if (spot.getName().equalsIgnoreCase(name)) {

```

```

        return spot;
    }
}
return null;
}
}

```

```

class ItineraryService {
    public void printItinerary(List<TouristSpot> spots) {
        System.out.println("\nYour Itinerary:");
        if (spots.isEmpty()) {
            System.out.println("No spots added to your itinerary.");
        } else {
            for (TouristSpot spot : spots) {
                System.out.println(spot);
            }
        }
    }
}

```

// Main Class

```

public class CityTourGuide {
    public static void main(String[] args) {
        CityGuideService guideService = new CityGuideService();
        ItineraryService itineraryService = new ItineraryService();
        Scanner scanner = new Scanner(System.in);

        System.out.println("Welcome to the City Tour Guide!");
    }
}

```

```

while (true) {
    System.out.println("\nMenu:");
    System.out.println("1. View Tourist Spots");
    System.out.println("2. Search Tourist Spot by Name");
    System.out.println("3. Create Itinerary");
    System.out.println("4. Exit");
    System.out.print("Enter your choice: ");
    int choice = scanner.nextInt();
    scanner.nextLine(); // Consume newline
    switch (choice) {
        case 1:
            List<TouristSpot> spots = guideService.getTouristSpots();
            System.out.println("\nAvailable Tourist Spots:");
            for (TouristSpot spot : spots) {
                System.out.println(spot);
            }
            break;
        case 2:
            System.out.print("Enter the name of the tourist spot: ");
            String name = scanner.nextLine();
            TouristSpot spot = guideService.findSpotByName(name);
            if (spot != null) {
                System.out.println("\nDetails:\n" + spot);
            } else {
                System.out.println("\nTourist spot not found.");
            }
            break;
        case 3:
            System.out.println("Enter names of spots for your itinerary (comma-

```

```

separated:");
        String[] selectedSpots = scanner.nextLine().split(",");
        List<TouristSpot> itinerary = new ArrayList<>();
        for (String spotName : selectedSpots) {
            TouristSpot selectedSpot =
guideService.findSpotByName(spotName.trim());
            if (selectedSpot != null) {
                itinerary.add(selectedSpot);
            }
        }
        itineraryService.printItinerary(itinerary);
        break;
    case 4:
        System.out.println("Thank you for using the City Tour Guide!");
        scanner.close();
        return;
    default:
        System.out.println("Invalid choice. Please try again.");
    }
}
}
}
}

```


APPENDIX B SCREENSHOTS

Viewing tourist spots:

```
Welcome to the City Tour Guide!

Menu:
1. View Tourist Spots
2. Search Tourist Spot by Name
3. Create Itinerary
4. Exit
Enter your choice: 1

Available Tourist Spots:
Tourist Spot: Eiffel Tower (Paris)
Description: Iconic landmark of Paris
Entry Fee: $25.5
Tourist Spot: Louvre Museum (Paris)
Description: World's largest art museum
Entry Fee: $17.0
Tourist Spot: Notre Dame Cathedral (Paris)
Description: Famous medieval cathedral
Entry Fee: $10.0
```

Search Tourist Spot by name:

Menu:

1. View Tourist Spots
2. Search Tourist Spot by Name
3. Create Itinerary
4. Exit

Enter your choice: 2

Enter the name of the tourist spot: Eiffel Tower

Details:

Tourist Spot: Eiffel Tower (Paris)

Description: Iconic landmark of Paris

Entry Fee: \$25.5

Create Itinerary:

```
Menu:
1. View Tourist Spots
2. Search Tourist Spot by Name
3. Create Itinerary
4. Exit
Enter your choice: 3
Enter names of spots for your itinerary (comma-separated):
Eiffel Tower, Louvre Museum, Notre Dame Cathedral

Your Itinerary:
Tourist Spot: Eiffel Tower (Paris)
Description: Iconic landmark of Paris
Entry Fee: $25.5
Tourist Spot: Louvre Museum (Paris)
Description: World's largest art museum
Entry Fee: $17.0
Tourist Spot: Notre Dame Cathedral (Paris)
Description: Famous medieval cathedral
Entry Fee: $10.0
```

Exit:

```
Menu:
1. View Tourist Spots
2. Search Tourist Spot by Name
3. Create Itinerary
4. Exit
Enter your choice: 4
Thank you for using the City Tour Guide!
```

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