Final Project Report – Database Management for Business

Husky Travel Agency

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About Us

Husky Travel Agency is a dynamic startup dedicated to revolutionizing the way students plan and embark on their travel adventures. At Husky Travel, we understand that students crave experiences beyond the classroom, and we're here to make those dreams a reality.

Our passion lies in crafting unforgettable travel experiences tailored to the unique interests and preferences of students. Whether you're a thrill-seeker looking for an adrenaline-packed getaway, a culture enthusiast eager to explore new landscapes, or someone simply seeking a break from the academic routine, Husky Travel has the perfect destination for you.

What sets us apart is our commitment to providing more than just travel packages – we offer a gateway to a world of possibilities. Our team is composed of avid travelers who share a common goal: to empower students to broaden their horizons, foster personal growth, and create lasting memories.

Husky Travel Agency prides itself on curating trips that combine adventure, education, and cultural immersion. From organizing group excursions to solo escapades, we've got you covered. Our carefully designed itineraries cater to various budgets, ensuring that every student can access the transformative power of travel.

In addition to seamless trip planning, our dedicated team is here to assist you at every step of your journey. We believe that travel should be stress-free, so we take care of the logistics, leaving you free to savor every moment of your adventure.

Join us at Husky Travel Agency, where we're not just planning trips; we're creating opportunities for exploration, learning, and self-discovery. Let your wanderlust guide you and let us be the compass that points you towards unforgettable experiences. Your adventure awaits – embark on it with Husky Travel Agency, and let the world become your classroom.

Objectives

Our primary focus is on empowering users to explore and find accessible flights, hotels, and car rentals, all with the ease of a user-friendly interface. Whether you're a seasoned traveler or embarking on your first journey, our database is designed to provide a seamless experience for planning your travel itinerary.

Key Features:

- **User-Friendly Interface**: Our travel booking system boasts an intuitive interface that allows users to effortlessly navigate through available options for flights, hotels,

and car rentals. The system is designed to be accessible and user-friendly, making the entire booking process a breeze.

- **Comprehensive Search Criteria**: Tailor your travel experience to your exact preferences with our comprehensive search criteria. Users can input specific dates, locations, and personal preferences to find the perfect combination of flights, accommodations, and transportation that suits their needs.
- **Real-Time Availability**: Our system is integrated with real-time data, ensuring that users have access to the most up-to-date information on flight schedules, hotel vacancies, and car rental availability. This feature enables users to make informed decisions based on current offerings.
- **Effortless Reservations**: Once you've found the ideal options, making reservations is just a click away. Our system streamlines the reservation process, allowing users to secure their bookings quickly and efficiently.
- **Automated Itinerary Generation**: Say goodbye to the hassle of organizing travel details manually. Our system automatically generates detailed itineraries for each user, consolidating all relevant information such as flight details, hotel reservations, and car rental information.
- **Personalized Recommendations**: To enhance your travel experience, our system provides personalized recommendations based on user preferences and travel history. This feature ensures that each trip is tailored to individual tastes, making every journey unique.
- **Customer Support**: At Husky Travel Agency, customer satisfaction is our priority. Our dedicated customer support team is ready to assist users with any queries or concerns, aiding with their travel planning and beyond.

Our Services

Flight and Booking Service:

Discover the convenience of reserving seats on your preferred flights and hotels seamlessly through our user-friendly interface. Our intuitive platform allows you to easily browse through a myriad of options, selecting the most suitable flights and accommodations that align with your travel preferences. From budget-conscious choices to premium selections, we've curated a diverse range of options to cater to every traveler's needs. With just a few clicks, you can secure your seats and accommodation, ensuring a stress-free booking experience.

Car Rental Service:

Explore your destination at your own pace with our comprehensive car rental service. Choose from a fleet of vehicles that spans compact cars for city exploration to spacious SUVs for adventurous road trips. Our platform provides detailed information about available models, pricing, and additional services, allowing you to select the perfect vehicle

that suits your travel needs. Experience the freedom of the open road with the confidence of a reliable and convenient car rental service.

Itinerary Generation:

Bid farewell to the complexities of organizing travel details manually. Our system takes care of the logistics by automatically generating comprehensive itineraries for your entire journey. These detailed itineraries include information on your booked flights, hotel reservations, and car rentals. This feature not only saves you time but also ensures that you have all the necessary details at your fingertips, making your travel experience organized and stress-free.

Group Travels:

Enhance your travel adventures by organizing group trips with friends or joining existing travel communities for a truly social experience. Our platform facilitates group travel arrangements, making it easy to coordinate plans, share itineraries, and create lasting memories together. Whether you're planning a getaway with your closest friends or looking to connect with like-minded travelers, Husky Travel Agency provides the perfect platform for creating shared travel experiences.

24/7 Support:

Your journey is our priority, which is why our dedicated support team is available around the clock to assist you with any questions or concerns. Whether you need guidance during the booking process, have inquiries about your itinerary, or encounter unexpected situations during your travels, our support team is just a message or call away. Travel with confidence, knowing that assistance is readily available whenever you need it. At Husky Travel Agency, your satisfaction is our commitment, and we strive to provide unparalleled support throughout your entire travel experience.

Market background

Exploring the Market Niche: Uniting Travel Services in a Unified Super App

Husky Travel Agency is set to make its mark in the competitive landscape of the Online Travel Agency (OTA) sector within the expansive travel and hospitality market. In this dynamic industry, OTAs play a pivotal role, serving as digital platforms that empower users to effortlessly search, compare, and book a wide array of travel services online, including flights, hotels, and car rentals.

OTAs: Transforming Travel Planning

Online Travel Agencies have become indispensable tools for modern travelers, providing a convenient and efficient way to plan and organize trips. They offer users the ability to explore a multitude of options, ensuring a personalized and tailored travel experience. From cost-effective choices to luxurious accommodations, OTAs serve as comprehensive hubs for individuals seeking seamless travel solutions.

Identifying Market Gaps: A Unified Super App

Husky Travel Agency is not just entering the OTA sector—it's poised to revolutionize it. Through keen market analysis, we have identified a notable gap in the existing landscape: the absence of a unified super app. While numerous platforms specialize in one aspect of travel—be it flights, hotels, or car rentals—our vision is to bring these services together under one virtual roof.

The Power of Integration: A Seamless Travel Experience

Our unified super app goes beyond conventional OTA offerings by consolidating car rental, hotel booking, and flight reservations into a singular, user-friendly platform. This integration simplifies the travel planning process, allowing users to seamlessly transition from exploring flights to booking accommodations and arranging transportation—all within a cohesive and intuitive interface.

Community-Centric Approach: Connecting Travel Enthusiasts

But we're not just about transactions; we're about building a community. Husky Travel Agency aims to cultivate a space where travel enthusiasts can connect, share experiences, and even embark on journeys together. Our platform is not merely a transactional tool; it's a social space that celebrates the spirit of exploration and the joy of shared adventures.

The Future of Travel: Innovation and Connection

As we step into the OTA sector, our commitment is to redefine the way individuals plan and experience travel. By addressing the market gap and introducing a unified super app, Husky Travel Agency is not just entering the market; it's shaping the future of travel by combining innovation, convenience, and community connection. Welcome to a new era of seamless, integrated, and community-driven travel experiences with Husky Travel Agency.

Entities

Flight:

flight_id, airline, departure_city, arrival_city, departure_date, arrival_date, available_seats, price_per_seat, Num_OF_packages, Price_per_package

HOTEL:

HOTEL_ID, NAME, LOCATION, AVAILABLE_ROOMS, PRICE_PER_NIGHT.

BOOKING:

BOOKING_ID, BOOKING_DATE, TOTAL_FLIGHT

Car Rental:

car_id, car_type, location, available_cars, price_per_day.

User:

user_id, name, email, password, payment_info.

Relationships & Cardinality:

Users can make multiple bookings for flights, hotels, and car rentals. Each booking is associated with a user and contains details about the specific flight, hotel, or car rental.

User - Booking Relationship:

Cardinality: One-to-Many (1:N)

Explanation: A user can make multiple bookings (1 User → N Bookings), but each booking is associated with only one user.

User_flight - Flight Relationship:

Cardinality: Many-to-One (N:1)

Explanation: Each booking can be associated with one flight (N Bookings → 1 Flight), but a flight can have multiple bookings.

User_hotel - Hotel Relationship:

Cardinality: Many-to-One (N:1)

Explanation: Similarly, each booking can be associated with one hotel (N Bookings → 1 Hotel), but a hotel can have multiple bookings.

User_car - Car Rental Relationship:

Cardinality: Many-to-One (N:1)

Explanation: Each booking can be associated with one car rental (N Bookings → 1 Car Rental), but a car rental can have multiple bookings.

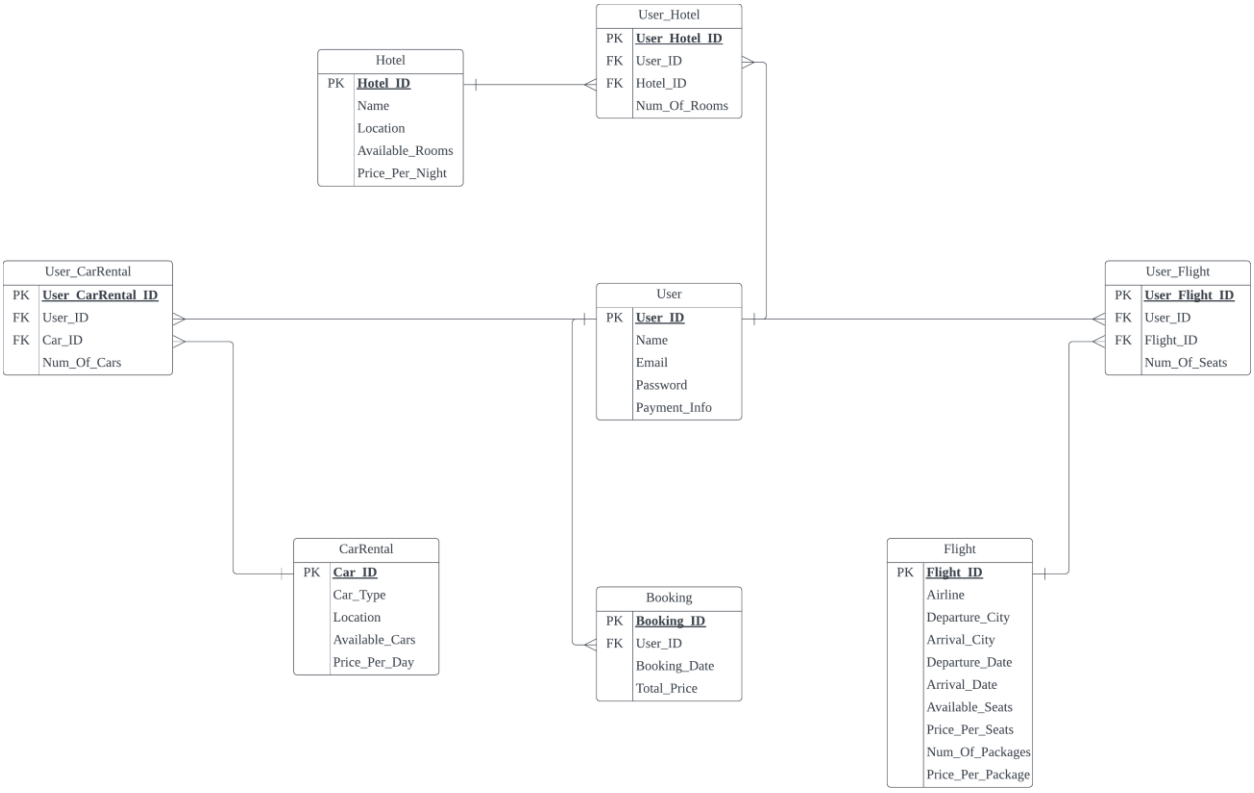
ERD Diagram

The proposed entity-relationship diagram (ERD) models a comprehensive travel reservation system with tables representing Flights, Hotels, Car Rentals, Users, Bookings, and intermediate junction tables connecting Users with their respective booked services. The Flight Table includes crucial flight details such as airline, departure, and arrival information, while the Hotel Table captures essential lodging information like name, location, and availability. The Car Rental Table encompasses details on available car types, locations, and prices. The User Table records user information, including name, email, password, and payment details. The Booking Table serves as a central point for recording user bookings, linking to Users and aggregating the total price. Junction tables such as User_Flight, User_Hotel, and User_Car_Rental establish relationships between Users and their booked services, capturing specific details like the number of seats, rooms, and cars. The interconnected relations between tables reflect the complex interactions within the travel reservation system, providing a comprehensive foundation for managing user reservations across flights, hotels, and car rentals.

Relational Schema

The relational schema presented encompasses a comprehensive database design for managing travel-related information. The schema includes tables such as Flight, Hotel, Car Rental, User, Booking, User_Flight, User_Hotel, and User_Car_Rental. Each table is meticulously structured, with primary keys uniquely identifying records within each entity. Relationships are established through foreign keys, creating connections between tables. For instance, the User table serves as a central hub, and foreign keys in the Booking,

User_Flight, User_Hotel, and User_Car_Rental tables link specific bookings, flights, hotel reservations, and car rentals to individual users. This relational schema provides a robust foundation for organizing and querying information related to flights, accommodations, users, and bookings within a travel management system.



SQL Queries

Queries

Retrieve all users

SELECT * From User;

SELECT * From Hotel;

SELECT * FROM CarRental;

SELECT * FROM Flight;

Retrieve all user bookings with hotel details:

```
 SELECT Booking.Booking_ID, Booking.User_ID, Booking.Booking_Date,
Booking.Total_Price,
    User.Name AS User_Name, User.Email AS User_Email,
    Hotel.Name AS Hotel_Name, Hotel.Location AS Hotel_Location
FROM Booking
JOIN User ON Booking.User_ID = User.User_ID
JOIN User_Hotel ON Booking.User_ID = User_Hotel.User_ID
JOIN Hotel ON User_Hotel.Hotel_ID = Hotel.Hotel_ID;
```

Retrieve all user bookings with flight details:

```
SELECT Booking.Booking_ID, Booking.User_ID, Booking.Booking_Date, Booking.Total_Price,
    User.Name AS User_Name, User.Email AS User_Email,
    Flight.Airline AS Flight_Airline, Flight.Departure_City, Flight.Arrival_City,
    Flight.Departure_Date, Flight.Arrival_Date
FROM Booking
JOIN User ON Booking.User_ID = User.User_ID
JOIN User_Flight ON Booking.User_ID = User_Flight.User_ID
JOIN Flight ON User_Flight.Flight_ID = Flight.Flight_ID;
```

Retrieve all bookings with total price greater than a specific amount:

```
SELECT * FROM Booking WHERE Total_Price > 100.00;
```

Retrieve users who have made a booking:

```
SELECT DISTINCT User.User_ID, User.Name, User.Email
FROM User
JOIN Booking ON User.User_ID = Booking.User_ID;
```

Retrieve hotels with available rooms greater than 10:

```
SELECT * FROM Hotel WHERE Available_Rooms > 10;
```

Retrieve users who have booked a car and a hotel:

```
SELECT DISTINCT User.User_ID, User.Name, User.Email
FROM User
JOIN User_Hotel ON User.User_ID = User_Hotel.User_ID
JOIN User_CarRental ON User.User_ID = User_CarRental.User_ID;
```

Retrieve users who have booked a flight with more than 3 seats:

```
SELECT DISTINCT User.User_ID, User.Name, User.Email
FROM User
JOIN User_Flight ON User.User_ID = User_Flight.User_ID
WHERE User_Flight.Num_Of_Seats > 3;
```

Retrieve bookings made after a specific date:

```
SELECT * FROM Booking WHERE STR_TO_DATE(Booking_Date, '%Y-%m-%d') > '2023-01-01';
```

Retrieve users and their bookings, ordered by booking date in descending order:

```
SELECT User.User_ID, User.Name, User.Email, Booking.Booking_ID, Booking.Booking_Date
FROM User
JOIN Booking ON User.User_ID = Booking.User_ID
ORDER BY Booking.Booking_Date DESC;
```

Retrieve car rentals with prices per day greater than $50, ordered by price in ascending order:

```
SELECT * FROM CarRental WHERE Price_Per_Day > 50.00 ORDER BY Price_Per_Day ASC;
```

Retrieve users who have booked a flight to a city starting with 'New':

```
SELECT DISTINCT User.User_ID, User.Name, User.Email
FROM User
JOIN User_Flight ON User.User_ID = User_Flight.User_ID
JOIN Flight ON User_Flight.Flight_ID = Flight.Flight_ID
WHERE Flight.Arrival_City LIKE 'New%';
```

Retrieve flights with available seats less than 100, ordered by available seats in ascending order:

```
SELECT * FROM Flight WHERE Available_Seats < 100 ORDER BY Available_Seats ASC;
```

Retrieve users who have booked a hotel or a car rental, ordered by user name:

```
SELECT DISTINCT User.User_ID, User.Name, User.Email
FROM User
LEFT JOIN User_Hotel ON User.User_ID = User_Hotel.User_ID
LEFT JOIN User_CarRental ON User.User_ID = User_CarRental.User_ID
WHERE User_Hotel.User_Hotel_ID IS NOT NULL OR User_CarRental.User_CarRental_ID IS NOT NULL
ORDER BY User.Name;
```

Aggregate Functions

Calculate the total number of available rooms in all hotels:

```
SELECT SUM(Available_Rooms) AS TotalAvailableRooms FROM Hotel;
```

Calculate the average price per night for all hotels:

```
SELECT AVG(Price_Per_Night) AS AveragePricePerNight FROM Hotel;
```

Count the number of bookings made by each user:

```
SELECT User.User_ID, User.Name, COUNT(Booking.Booking_ID) AS NumberOfBookings
FROM User
```

```
LEFT JOIN Booking ON User.User_ID = Booking.User_ID
GROUP BY User.User_ID;
```

Find the highest price per day for car rentals:

```
SELECT MAX(Price_Per_Day) AS HighestPricePerDay FROM CarRental;
```

Calculate the total number of seats available in all flights:

```
SELECT SUM(Available_Seats) AS TotalAvailableSeats FROM Flight;
```

Calculate the average number of rooms booked per user in hotels:

```
SELECT User.User_ID, User.Name, AVG(User_Hotel.Num_Of_Rooms) AS AvgRoomsBooked
FROM User
JOIN User_Hotel ON User.User_ID = User_Hotel.User_ID
GROUP BY User.User_ID;
```

Calculate the total price of all bookings made by a specific user:

```
SELECT User.User_ID, User.Name, SUM(Booking.Total_Price) AS TotalSpent
FROM User
JOIN Booking ON User.User_ID = Booking.User_ID
GROUP BY User.User_ID;
```

Join Queries

Retrieve users along with their booked hotels (including those with no bookings):

```
SELECT User.User_ID, User.Name, User.Email, Hotel.Name AS Hotel_Name
FROM User
LEFT JOIN User_Hotel ON User.User_ID = User_Hotel.User_ID
LEFT JOIN Hotel ON User_Hotel.Hotel_ID = Hotel.Hotel_ID;
```

Retrieve users who have booked both a hotel and a car rental:

```
SELECT DISTINCT User.User_ID, User.Name, User.Email
FROM User
JOIN User_Hotel ON User.User_ID = User_Hotel.User_ID
JOIN User_CarRental ON User.User_ID = User_CarRental.User_ID;
```

Retrieve users who have booked a flight along with flight details (inner join):

```
SELECT User.User_ID, User.Name, User.Email, Flight.Flight_ID, Flight.Airline,
Flight.Departure_City, Flight.Arrival_City
FROM User
JOIN User_Flight ON User.User_ID = User_Flight.User_ID
JOIN Flight ON User_Flight.Flight_ID = Flight.Flight_ID;
```

Retrieve hotels and their bookings along with user details (inner join):

```
SELECT Hotel.Hotel_ID, Hotel.Name AS Hotel_Name, Hotel.Location, Booking.Booking_ID,
Booking.Booking_Date, User.Name AS User_Name
FROM Hotel
JOIN User_Hotel ON Hotel.Hotel_ID = User_Hotel.Hotel_ID
JOIN Booking ON User_Hotel.User_ID = Booking.User_ID
JOIN User ON Booking.User_ID = User.User_ID;
```

Retrieve hotels and their bookings along with user details (inner join):

```
SELECT Hotel.Hotel_ID, Hotel.Name AS Hotel_Name, Hotel.Location, Booking.Booking_ID,
Booking.Booking_Date, User.Name AS User_Name
FROM Hotel
JOIN User_Hotel ON Hotel.Hotel_ID = User_Hotel.Hotel_ID
JOIN Booking ON User_Hotel.User_ID = Booking.User_ID
JOIN User ON Booking.User_ID = User.User_ID;
```

Retrieve flights with no bookings:

```
SELECT Flight.Flight_ID, Flight.Airline, Flight.Departure_City, Flight.Arrival_City
FROM Flight
LEFT JOIN User_Flight ON Flight.Flight_ID = User_Flight.Flight_ID
WHERE User_Flight.User_Flight_ID IS NULL;
```

Retrieve users who have made a booking with their total spending (using a subquery):

```
SELECT User.User_ID, User.Name, User.Email, (
   SELECT SUM(Booking.Total_Price)
   FROM Booking
   WHERE Booking.User_ID = User.User_ID
) AS TotalSpent
FROM User;
```

Retrieve hotels and car rentals booked by a specific user:

```
SELECT User.Name AS User_Name, User_Hotel.Hotel_ID, Hotel.Name AS Hotel_Name,
     User_CarRental.Car_ID, CarRental.Car_Type
FROM User
LEFT JOIN User_Hotel ON User.User_ID = User_Hotel.User_ID
LEFT JOIN Hotel ON User_Hotel.Hotel_ID = Hotel.Hotel_ID
LEFT JOIN User_CarRental ON User.User_ID = User_CarRental.User_ID
LEFT JOIN CarRental ON User_CarRental.Car_ID = CarRental.Car_ID;
```

Future Challenges

Our database model appears to be a reasonable representation for managing bookings related to hotels, car rentals, and flights. However, like any database model, it may face certain challenges. Here are some potential future challenges and considerations:

Scalability:

As the amount of data in the database grows, scalability could become an issue. It's important to ensure that the database design can handle a larger volume of transactions and data without significant performance degradation.

Normalization and Denormalization:

Our database model follows normalization principles but depending on the specific use cases and query requirements, you might need to balance normalization and denormalization. Denormalization could be considered for improving query performance in certain scenarios.

Data Integrity:

Ensuring data integrity is crucial. The model relies on foreign key constraints to maintain relationships between tables. Care should be taken to handle data insertion, updates, and deletions to prevent orphaned records and maintain referential integrity.

Security:

Implementing proper security measures to protect sensitive data, especially user information, is crucial. This includes encrypting passwords, implementing secure authentication, and restricting access to sensitive information.

Optimizing Queries:

As the database grows, the need for optimizing queries may arise. This involves creating appropriate indexes, analyzing query performance, and potentially denormalizing certain data to meet specific performance requirements.

Backup and Recovery:

Establishing robust backup and recovery procedures is essential to protect against data loss. Regularly backing up the database and ensuring that recovery processes are in place can mitigate risks associated with data corruption or accidental deletions.

Regulatory Compliance:

Depending on the nature of the data stored in the database, ensuring compliance with relevant data protection and privacy regulations (e.g., GDPR, HIPAA) is important. This may involve implementing features like data anonymization and auditing.

User Experience and Business Logic:

Adapting the database model to changes in business logic and user requirements over time may be necessary. This includes introducing new features, modifying existing ones, and ensuring a positive user experience.

Cross-Platform Compatibility:

If the application using the database is deployed across different platforms or devices, ensuring cross-platform compatibility and performance can be a challenge.

Regularly reviewing and updating the database model based on evolving business needs and technological advancements can help address these challenges. Additionally, performance monitoring and optimization are ongoing processes to ensure the continued efficiency of the database system.

Conclusion:

Husky Travel Agency emerges not just as an innovative startup in the travel industry but as a transformative force reshaping how students engage with their wanderlust. Our commitment extends far beyond providing travel packages; we're dedicated to empowering students, nurturing personal growth, and facilitating experiences that transcend the traditional classroom setting.

Through a seamless, user-friendly interface, we have curated an extensive database that simplifies the travel planning process, making it accessible to both seasoned travelers and those venturing out for the first time. Our platform integrates real-time data, ensuring up-to-date information for flights, accommodations, and car rentals, allowing users to make informed decisions effortlessly.

What truly sets us apart is our community-centric approach. We don't just facilitate transactions; we foster connections. By bridging the gap in the market with a unified super app, we aim not only to streamline travel planning but also to create a space where travel enthusiasts can connect, share experiences, and embark on journeys together.

The future of travel lies in innovation, convenience, and community connection, and at Husky Travel Agency, we are at the forefront of this evolution. As we continue on this journey, we invite you to join us in redefining travel experiences, making exploration, learning, and self-discovery integral parts of every adventure. With Husky Travel Agency, let the world be your classroom, and let your wanderlust guide you towards unforgettable experiences.