SULTAN QABOOS UNIVERSITY

COLLEGE OF SCIENCE

DEPARTMENT OF COMPUTER SCIENCE

COMP3205: INTRODUCTION TO DATABASE SYSTEMS

Tourism Management Database System in Oman

Project Part 2

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Requirement Specification:

Based on our analysis and system needs, we have specified the following requirements:

1. The system allows users to register and manage accounts, enabling them to book and track their reservations.

2. A tourist must provide a username, password, nationality, email, full name, and phone number to create an account.

3. Each tourist can have multiple reservations, but a single reservation is linked to only one tour package at a time.

4. The system should support different types of users, including regular customers and administrators.

5. Reservations include details such as Booking ID, date and status (approved, waiting, canceled).

6. Each Tourist must be classified as a local or foreign tourist.

Constraints

1 .Usernames and emails must be unique.

2. A reservation cannot be confirmed without specifying all booking details.

3. Trip schedules must ensure that arrival times do not precede departure times.

4. User passwords must be stored securely using encryption.

5. Reservation status should be limited to "approved," "waiting," or "canceled."

Relations

1. A Tourist entity is related to the Booking entity by the Tourist ID.

2 .A Booking entity is associated with the Tour Package entity by the Tour Package ID.

3. A Tour Package entity is related to the Tour Guide by Tour Package ID.

4. A tourist office entity related to the tour package by Tourist office ID.

5. A Destination entity is related to Tour Package through Destination ID.

6. A Destination entity is related to Tourist by Destination ID.

7. A Review entity related to the Tourist by Review ID.

8. A Hotel entity is related to a Booking entity by Hotel ID.

Requirement Analysis:

Entities Table

Entity Name	Description	Justification
Tourist	Represents a traveler who makes hotel and tour package reservations through the system.	Essential for managing user data and identifying system users.
Destination	A variety of tourist destinations, including beaches, castles, mountains, museums, and traditional marketplaces.	Enables the administration and presentation of tourism attractions to guests.
Hotel	Hotels that are available for lodging, along with reviews and pricing information.	Help tourists find and book suitable accommodations.
Tour Guide	Tour guides who assist tourists during their trips.	Enables visitors to make use of guidance when they are in new locations.
Tour Package	Packages for tours that visit several different locations.	Organizes tourism offerings and provides different options for tourists.
Booking	Traveler-made hotel or tour package reservations.	Allows the system to assess availability and manage booking procedures.
Review	Ratings and feedback left by tourists for destinations, hotels, and tours.	Helps improve services by using feedback and ratings from visitors.

Attributes Table

Attribute Name	Entity	Data Type	Constraints
Tourist ID	Tourist	INT	Primary key, unique
Name	Tourist	VARCHAR (60)	Not Null
Nationality	Tourist	VARCHAR (60)	Not Null

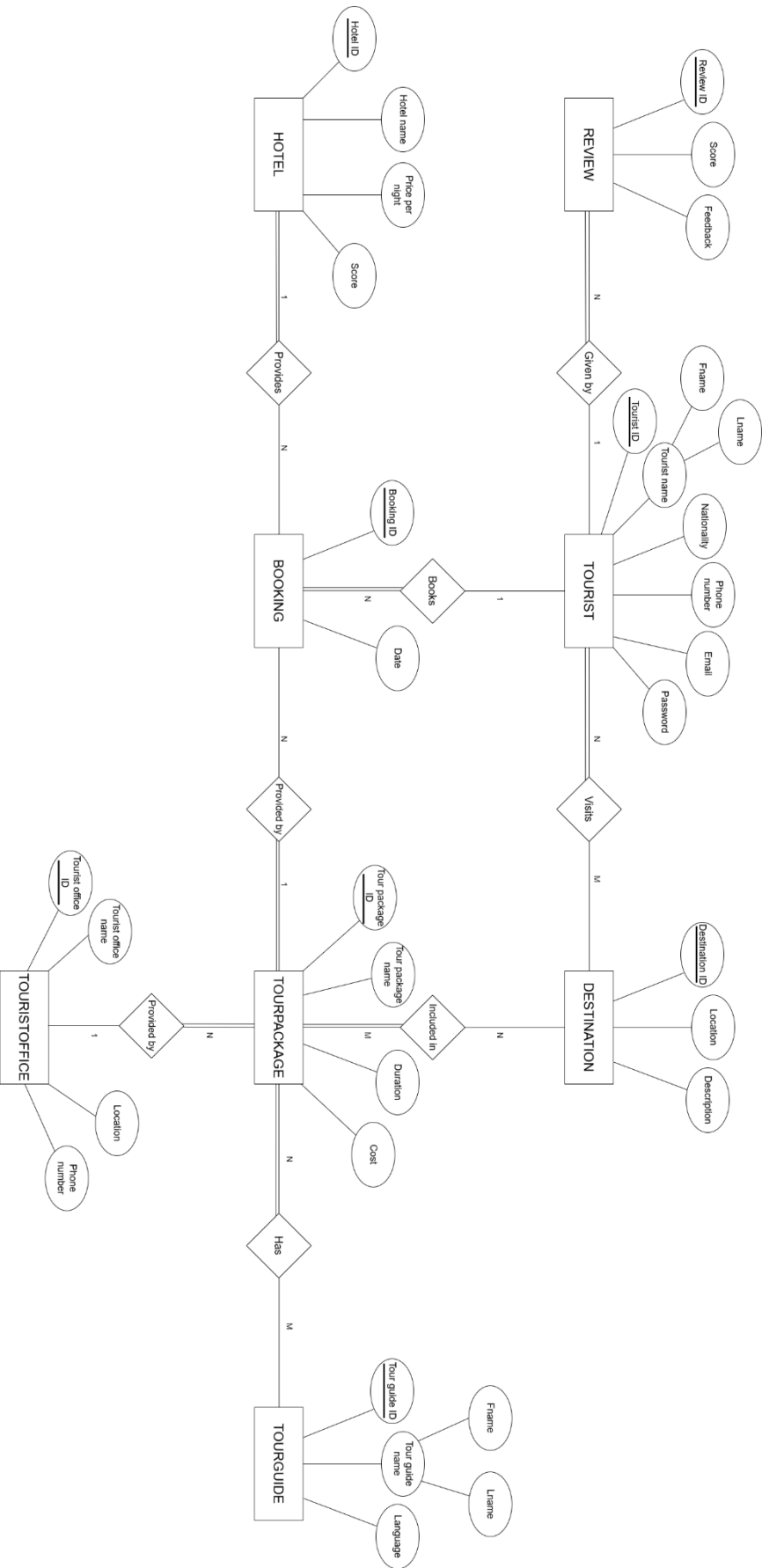| Email	Tourist	VARCHAR (100)	It must be distinct
Phone Number	Tourist	VARCHAR (15)	It must be distinct
Destination ID	Destination	INT	Primary key and unique for each destination
Location	Destination	VARCHAR (100)	Not Null
Description	Destination	TEXT	Not Null
Hotel ID	Hotel	INT	Each hotel's primary key and unique
Hotel Name	Hotel	VARCHAR (100)	Not Null
Price Per Night	Hotel	DECIMAL (10,2)	The number must be positive.
Score	Hotel	FLOAT	The number must be between 1 and 5.
Tour Guide ID	Tour Guide	INT	Each guide's primary key and unique
Name	Tour Guide	VARCHAR (100)	Not Null
Language	Tour Guide	VARCHAR (50)	lists the languages that the guide speaks.
Tour Package ID	Tour Package	INT	Primary key and unique for each package
Package Name	Tour Package	VARCHAR (100)	Not Null

Cost	Tour Package	DECIMAL (10,2)	The number must be positive.
Booking ID	Booking	INT	Primary key, unique for each booking
Tourist ID	Booking	INT	Foreign key referring to the tourist making the booking
Hotel ID	Booking	INT	Foreign key referring to the booked hotel
Tour Package ID	Booking	INT	acts as the foreign key linking to the booked tour package.
Date	Booking	DATE	Not Null
Review ID	Review	INT	Primary key, unique for each review
Tourist ID	Review	INT	acts as the foreign key linking to the tourist who provided the review.
Score	Review	FLOAT	The number must be between 1 and 5
feedback	Review	TEXT	Not Null

Relationships Table

Relationship Name	Participating Entities	Role	Justification
Visits	Tourist - Destination	The tourist visits a tourist destination.	displays the locations that a traveler has been to.
has	Tour Package - Tour Guide	Tour package has tour guide.	Determines the guide assigned to lead the group during the tour.
Books	Tourist - Booking	The tourists make a booking for a hotel or tour.	displays the hotel and tour reservation details.

Guides	Tour Guide - Tourist	The tour guide helps visitors.	connects visitors with tour guides.
Provides	Hotel - Booking	Tourists can make reservations at the hotel.	lists the hotels that have been reserved.
Includes	Tour Package - Destination	Certain locations are included in the tour package.	defines the places that are part of every package.
Reviews	Tourist - Review	The tourist writes a review about a place or hotel.	enables visitors to provide reviews of lodging and attractions.

ER Diagram

Relationship	Entities Involved	Cardinality	Justification
Visits	Tourist - Destination	N:M	A Tourist can visit multiple destinations. While a destination can have many visitors.
Books	Tourist - Booking	1:N	Tourist books bookings for hotels or tours. While a booking is associated with one tourist.
Provides	Hotel - Booking	1:N	Hotels provide many bookings. While a booking is provided by one hotel.
Provided by	Booking - Tour Package	N:1	A booking is provided by one tour package. While the tour package provides many bookings.
Included in	Destination - Tour Package	N:M	A destination can be included in many tour packages. While a tour package includes multiple destinations.
Given by	Review - Tourist	N:1	A review is given by one tourist. While a tourist can review many reviews.
Has	Tour Package - Tour Guide	N:M	A tour package can have many tour guides. And a tour guide can be assigned to many tour packages.
Provided by	Tour Package - Tourist Office	N:1	A tour package is provided by one tourist office. While a tourist office provides many tour packages.

Relationship	Participation
Every review is given by a tourist.	Total
Not every tourist gives a review.	Partial

Every tourist visits a destination.	Total
Some destinations are not visited by any tourists.	Partial
All hotels provide bookings.	Total
Some bookings are not provided by hotels.	Partial
All tour packages provide bookings.	Total
Some bookings are not provided by tour packages.	Partial
Every tour package has a tour guide.	Total
Some tour guides are not assigned for any tour package.	Partial
Some tourists do not make any bookings.	Partial
All bookings are booked by tourists.	Total
Every tour package includes destinations.	Total
Some destinations are not included in any tour package.	Partial
Every tour package is provided by tourist offices.	Total
Some tourist offices do not provide tour packages.	Partial

EER Diagram

Superclasses and Subclasses:

1. Tourist as a superclass with local and foreign as subclasses where the tourist type is the defining attribute.

2. Booking as a superclass with approved, waiting, and cancelled as a subclass where the booking status is the defining attribute. For approved booking entities we have the local attribute "cost" and for the cancelled booking we have the attribute "reason" (ex: technical issues, payment fail, …).

The Need for the New Classes:

The addition of subclasses for **Tourist** (Local and Foreign) helps in better categorization, allowing personalized services based on nationality, language

preferences, and special requirements. Similarly, the **Booking** status subclasses (Approved, Waiting, and Canceled) improve booking management by tracking reservation progress and automating updates. These classifications enhance efficiency, streamline operations, and provide a more tailored experience for users.

EER Diagram