CPSC 3300 21SQ

Personal Database Project

Project Name

Melvin Cruise Line

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# Overview

## Purpose

This database will keep records of the customers who plan on taking a trip on the cruise line, detailed information about a customer, employees of the cruise line, employees’ certifications, the employees who will be working a trip, the departments that will handle a trip’s operations, information on ships, available trips, and information on the routes that are available.

## Key Users

List and describe each type of user of the database by role and actions they will perform

|  |  |
| --- | --- |
| Role (Who uses it) | Action (What they can do) |
| Reservation Officer | Create reservations for customers on the cruise line for those who need help making reservations, changing reservations, or cancelling reservations. |
| Customer | Create reservations for themselves and book rooms on a specific route and date of departure. Can view their trip information. |
| Hiring Manager | Add new employees and their information. |
| Certification Manager | Add new certifications for employees. |

## Key data to store

List and describe the key data and description.

What makes the data you store interesting, special, and worth storing in a database

|  |  |
| --- | --- |
| Data | Description |
| Customer | Data of the customers’ first/last name, birthday, origin, and email. |
| Customer Trips | Data collection of the trips that have been reserved by customers. |
| Employee | Data on employee information such as their first name and last name. |
| Route | Data on the routes that are available for the cruise line to establish trips. Departure and arrival locations are included in each route. |
| Ship | Data on the different ships that are available for use. |
| Trip | Data that shows which trips are available for customers to book. Information includes the route the trip will take, the ship that will be used, and the date of the trip. |
| Department | Data of the departments on the ship that will manage staff |
| Certification | Data of what departments employees are qualified to work in and the date of when an employee obtained the certification |
| Staff | Data of which department each employee will be working under during a specific trip |

## Key Features

|  |  |  |
| --- | --- | --- |
| ID | Feature | Description |
| KF1 | Customer Entry | Add a customer into the system with their personal information in order for them to reserve trips. |
| KF2 | Search for Customer and their Information | Search for a customer based on their first name, last name, to see data on their reservation information, place of origin, date of birth, etc. |
| KF3 | Search Ship | Search for a ship and give data on the route it will be sailing. |
| KF4 | Search for Employees | Search for an employee and see their information such as first/last name, certifications, etc. |
| KF5 | Search Route | Search for the trip that will be sailing a specific route and give information on its departure and arrival location. |

# Data Model

## Business Rules

|  |  |  |
| --- | --- | --- |
| Rule ID | Rule | Description |
| BR1 | Customers should be able to make their own reservations | Customer can choose the route they want to travel and the date they would want to sail on the cruise. |
| BR2 | Administrator can edit a customer’s reservation | Administrator will be allowed to access reservation information of a customer who needs help with changes or cancellations. |
| BR3 | Ships must have a route and originate from the US | A ship must be given a designated route it will sail. The departure and arrival ports must be within the US. |
| BR4 | Route must be named and contain one ship only. | A route the cruise line is allowed to sail in will have one ship assigned to it and one ship only. There may not be more than one ship sailing a given route. |
| BR5 | A customer must fill in all the information they are asked. | A customer must fill in all their information before making a reservation, including their first name, last name, email address, city of origin, and birth date. |
| BR6 | An employee must work for only one department per trip | An employee is allowed to work under only one department for a trip, but can have certification to work under multiple departments. |

## Relationships

### One to Many (Most tables are 1:M)

One cruise ship will sail many trips and many trips can be sailed by one ship.

### Many to Many (You must have 2 MM tables)

A customer can reserve many trips and a trip can be reserved by many customers.

An employee can be certified to work in many departments and a department certify many employees to work under it.

A trip employs many employees and an employee can work on many trips.

## Constraints

1. A customer must have one, unique ID number

2. A cruise ship must have one, unique ID number

3. An employee must have one, unique ID number

4. A route must have one, unique ID number or name

5. Customer information must not be NULL

6. Employee information must not be NULL

# Relational Database Model (RDM)

## Tables

|  |  |
| --- | --- |
| Table | Description |
| EMPLOYEE | Holds detailed information of an employee such as: First Name, Last Name, and their ID. |
| SHIP | Holds information of the ship ID and ship name. |
| CUSTOMER | Holds detailed information of a customer such as: First Name, Last Name, Birth Date, Place of Origin, Customer ID, and Email Address. |
| ROUTE | Holds information of the route a trip will take, routes will have an ID. |
| CUSTOMERTRIPS | Bridge table between CUSTOMER and TRIP. |
| TRIP | Holds information of the reservations for that trip, route the trip will take, the trip ID, and the ship a specific trip will have. |
| DEPARTMENT | Holds the information of different departments on the ship |
| CERTIFICATION | Bridge table between EMPLOYEES and DEPARTMENT |
| STAFF | Bridge table between TRIP and DEPARTMENT |

## Table Definition

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| SHIP | Attribute | Description | Type | Constraint | Nullable |
|  | SHIP\_ID | Unique identifier for each ship | INT | PK, Auto-Increment | No |
|  | SHIP\_NAME | Name of the ship | VARCHAR(30) | 30 characters | No |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| EMPLOYEE | Attribute | Description | Type | Constraint | Nullable |
|  | EMPLOYEE\_ID | Unique identifier for each employee | INT | PK, Auto-Increment | No |
|  | EMPLOYEE\_FIRST\_NAME | First name of the employee | VARCHAR(30) | 30 characters | No |
|  | EMPLOYEE\_LAST\_NAME | Last name of the employee | VARCHAR(30) | 30 characters | No |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| CUSTOMER | Attribute | Description | Type | Constraint | Nullable |
|  | CUSTOMER\_ID | Unique identifier for each employee | INT | PK, Auto-Increment | No |
|  | CUSTOMER\_FIRST\_NAME | First name of the customer | VARCHAR(30) | 30 characters | No |
|  | CUSTOMER\_LAST\_NAME | Last name of the customer | VARCHAR(30) | 30 characters | No |
|  | CUSTOMER\_BDAY | Customer’s birth date | Date | Mm/dd/yyyy | No |
|  | CUSTOMER\_ORIGIN | Customer’s city of origin | VARCHAR(30) | 30 characters | No |
|  | CUSTOMER\_EMAIL | Customer’s email address | VARCHAR(50) | 50 characters | No |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| ROUTE | Attribute | Description | Type | Constraint | Nullable |
|  | ROUTE\_ID | Unique identifier for each route | INT | PK, Auto-Increment | No |
|  | ROUTE\_DEPARTURE | Departure location of a certain cruise route | VARCHAR(20) | 20 characters | No |
|  | ROUTE\_ARRIVAL | Arrival location of a certain cruise route | VARCHAR(20) | 20 characters | No |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| TRIP | Attribute | Description | Type | Constraint | Nullable |
|  | TRIP\_ID | Unique identifier for each trip | INT | PK, Auto-Increment | No |
|  | ROUTE\_ID | Unique identifier for the route the trip take | INT | FK | No |
|  | SHIP\_ID | Unique identifier for the ship the trip will take | INT | FK | No |
|  | TRIP\_DATE | The date that the trip will start on | DATE | Date format | No |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| CUSTOMERTRIPS | Attribute | Description | Type | Constraint | Nullable |
|  | TRIP\_ID | Unique identifier for the trip the reservation will be for | INT | PK, FK | No |
|  | CUSTOMER\_ID | Unique identifier for the customer who is making the reservation | INT | PK, FK | No |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| DEPARTMENT | Attribute | Description | Type | Constraint | Nullable |
|  | DEPARTMENT\_ID | Unique identifier for each department | INT | PK, Auto-Increment | No |
|  | DEPARTMENT\_NAME | Name of each department | VARCHAR(20) | 20 characters | No |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| CERTIFICATION | Attribute | Description | Type | Constraint | Nullable |
|  | DEPARTMENT\_ID | Unique identifier for the department the job type is in | INT | PK, FK | No |
|  | EMPLOYEE\_ID | Unique identifier for the employee working in that job type | INT | PK, FK | No |
|  | CERTIFICATION\_DATE | The date that an employee became certified to work in a department | DATE | Date format | No |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| STAFF | Attribute | Description | Type | Constraint | Nullable |
|  | TRIP\_ID | Unique identifier for the trip the staff will be working for | INT | PK, FK | No |
|  | EMPLOYEE\_ID | Unique identifier for the staff that will be working for a trip | INT | PK, FK | No |
|  | DEPARTMENT\_ID | Unique identifier for the department the staff will be working under for a trip | INT | FK | No |

# Entity Relationship Diagram (ERD)



# Queries

Text

Description automatically generated1. What is the number of customers that will be sailing from Anchorage to Honolulu?

VIEW\_CUSTOMERSTOTAL\_ANCHORAGETOHONOLULU

Text

Description automatically generated2. What is the number of trips Daisy Chang is not going to be on?

## Select Query with Inner Join across at least three tables

Text

Description automatically generated 3. Which of the customers will be on the trip from San Diego to Seattle?

## Select Query with Left Outer Join finding missing data from the left table

4. Which departments do not have any staff on any of the trips?

What tables will it join

This query will join the DEPARTMENT table with the STAFF AND TRIP tables.

What is the data null data you will look for?

Text

Description automatically generated The TRIP.TRIP\_DATE will be the null data I will look for.

Text

Description automatically generated5. Query to return the number of ships that will be sailing before 2021-05-24

Text

Description automatically generated 6. Query to return how many employees are certified to work in the PERFORMANCE department

# Views

Your project must have at least 1 view that de-normalizes data as part of a select from the view

All data return in the result must come exclusively from views

## SQL to create the View

Describe at least one View you will need that de-normalizes the data for your final report

Text

Description automatically generated 1. A view that shows the employees and their employment information.

Text

Description automatically generated 2. A view that shows all customers and their trip information.

Text

Description automatically generated 3. A view that shows which employees are working in which department on each trip. The staff on each trip.

Text

Description automatically generated 4. A view that shows all trips available and the trip information.

# Stored Procedures

All data must be inserted exclusively with Stored Procedures using natural values (not IDs)

## SQL for Stored Procedure

List the names of the stored procedures to add data with the parameters

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# Wrapping Stored Procedures (Create and Show Result)

Your database will wrap all commands inside two stored procedures.

F) Data Result:  You will create a single Stored Procedure named:SP\_SHOW\_RESULT that will run all the proper select queries exclusively from your Views to generate a data visualization that matches the interesting features you database supports

## SP\_CREATE\_DATA

This single Stored Procedure will call other stored procedures to do the following:

SP\_CREATE\_DATA

Drop Tables: SP\_DROP\_TABLES

Create Tables: SP\_CREATE\_TABLES

Create Views: SP\_CREATE\_VIEWS

Populate Data: SP\_POPULATE\_DATA

## SP\_SHOW\_RESULT

This Stored Procedure will return results from your interesting views. It will not call any tables directly only views.

SP\_SHOW\_RESULT

SELECT \* from VIEW\_CUSTOMERS\_ALL;

SELECT \* FROM VIEW\_EMPLOYEES\_ALL;

SELECT \* FROM VIEW\_STAFF\_ALL;

SELECT \* FROM VIEW\_TRIP\_ALL;

SELECT \* FROM VIEW\_CUSTOMERS\_SANDIEGOTOSEATTLE;

SELECT \* FROM VIEW\_CUSTOMERSTOTAL\_ANCHORAGETOHONOLULU;

SELECT \* FROM VIEW\_TOTALTRIPS\_WITHOUTDAISYCHANG;

SELECT \* FROM VIEW\_NOSTAFF\_DEPARTMENTS;

SELECT \* FROM VIEW\_TOTALSHIPSSAIL\_BEFOREDATE;

SELECT \* FROM VIEW\_EMPLOYEECERTIFIED\_PERFORMANCE;

# Final Project Requirements

## Document Requirements

1. Document must be well written, formatted, and professional
2. Your system must have a minimum of 6 required tables in 4NF form
3. Must have at least two M:M relationships
4. Must use Views for all data returned in the final result

## SQL Scripts

A) SQL Script: You will submit fully functioning SQL script for the Database design. All commands must be wrapped inside a stored procedures. The overall stored procedure that will execute the commands shall be named: SP\_CREATE\_DATA

B) Data Views:  You will create Views that will show the denormalized data from the proposal document using natural values. (Mike instead of Person\_ID etc.) These views should be interesting views, and must be used in your report for Data Result (F), and the only way data is gathered for Data Result (F)

C) Stored Procedures: You will create Stored Procedures that will Insert and Update data in all tables using natural values (Mike instead of Person\_ID etc.)

D) Data Population:  You will Populate all data in the database exclusively using Stored Procedures. Each table must have at least two rows, and all attributes populated.

E) Calling Data population: You will create a stored procedure that populates all the data.  This stored procedure will call all other data population stored procedures using only natural values.

F) Data Result:  You will create a single Stored Procedure named:SP\_SHOW\_RESULT that will run all the proper select queries exclusively from your Views to generate results

G) All SQL Scripts will run to completion, with no errors

H) All SQL Scripts will contain comments for documentation

## Grading of SQL

Grading of the execution of the SQL will be the following procedure

1. Open the single SQL file
2. Execute the entire loaded SQL
3. Run SP\_CREATE\_DATA
4. Run SP\_SHOW\_RESULT
5. Review the SQL