INF10025 Data Management and Analytics

Task 5 – Credit Submission

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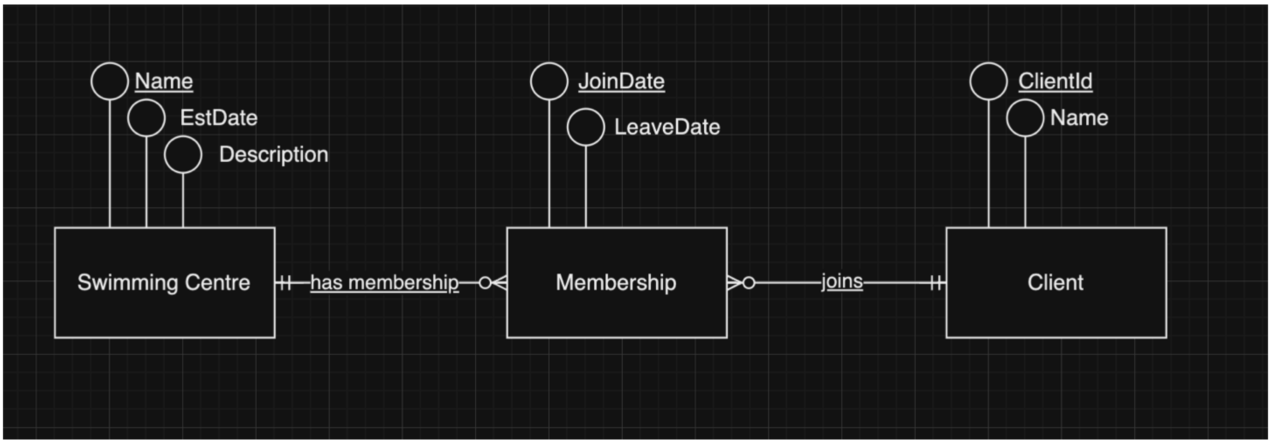
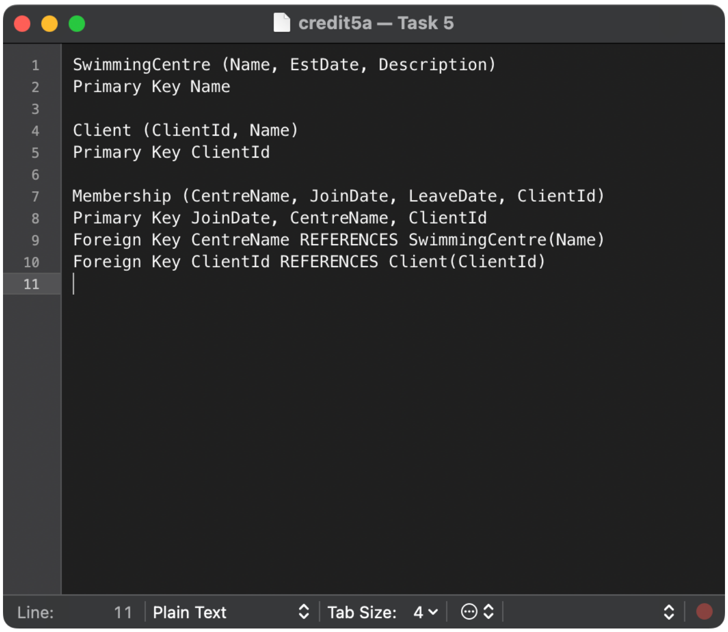
Credit 5a





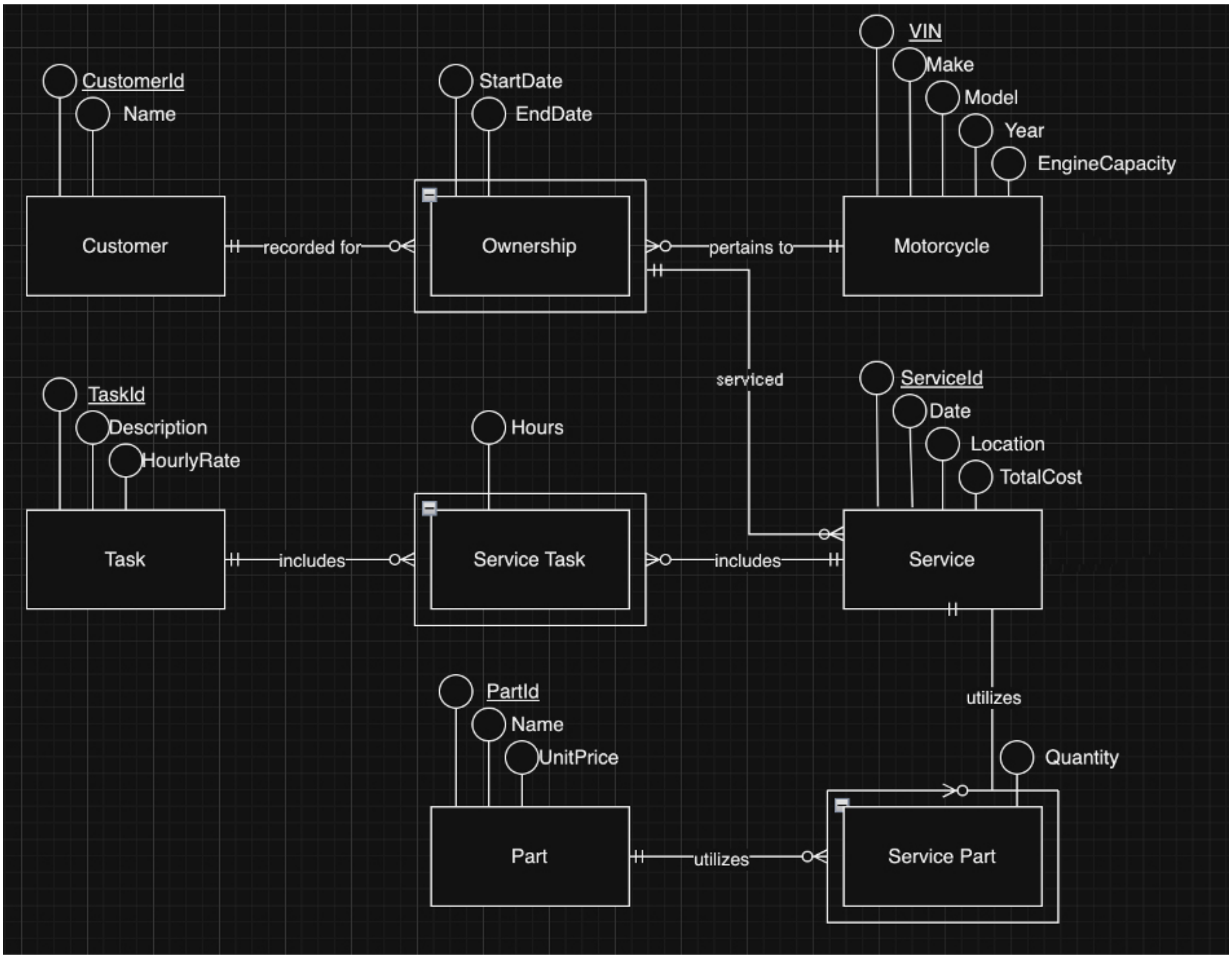
```
SwimmingCentre (Name, EstDate, Description)
Primary Key Name

Client (ClientId, Name)
Primary Key ClientId

Membership (CentreName, JoinDate, LeaveDate, ClientId)
Primary Key JoinDate, CentreName, ClientId
Foreign Key CentreName REFERENCES SwimmingCentre(Name)
Foreign Key ClientId REFERENCES Client(ClientId)
```

Centre Name	**EstablishmentDate**	**Description**
Blue Lagoon	2015-01-15	Olympic size pool
Aqua Fun	2018-05-20	Fun activities pool
Deep Dive	2020-11-05	Diving training pool

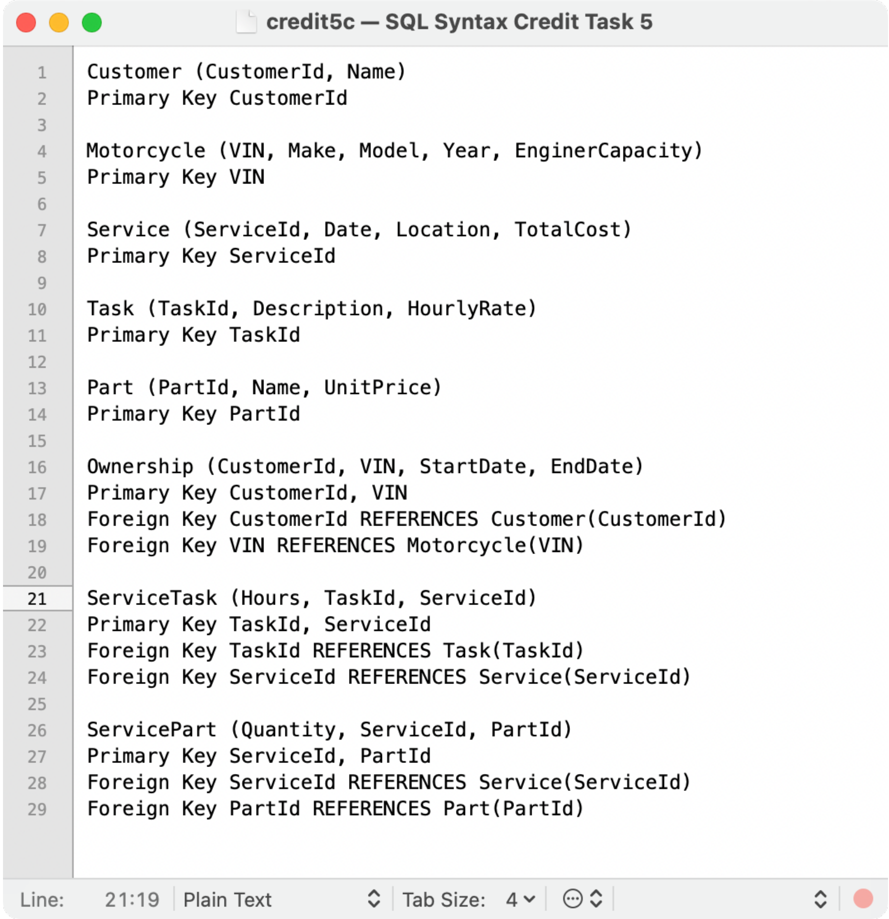
ClientId	**Name**
1	John Doe
2	Marco Giacoppo
3	Corey Santarossa

CentreName	**ClientId**	**JoinDate**	**LeaveDate**
Blue Lagoon	1	2022-04-12	2022-06-01
Blue Lagoon	1	2023-01-10	NULL
Aqua Fun	2	2022-07-15	2022-09-15
Deep Dive	3	2023-04-01	NULL

Credit 5b



Credit 5c



```
Customer (CustomerId, Name)
Primary Key CustomerId

Motorcycle (VIN, Make, Model, Year, EnginerCapacity)
Primary Key VIN

Service (ServiceId, Date, Location, TotalCost)
Primary Key ServiceId

Task (TaskId, Description, HourlyRate)
Primary Key TaskId

Part (PartId, Name, UnitPrice)
Primary Key PartId

Ownership (CustomerId, VIN, StartDate, EndDate)
Primary Key CustomerId, VIN
Foreign Key CustomerId REFERENCES Customer(CustomerId)
Foreign Key VIN REFERENCES Motorcycle(VIN)

ServiceTask (Hours, TaskId, ServiceId)
Primary Key TaskId, ServiceId
Foreign Key TaskId REFERENCES Task(TaskId)
Foreign Key ServiceId REFERENCES Service(ServiceId)

ServicePart (Quantity, ServiceId, PartId)
Primary Key ServiceId, PartId
Foreign Key ServiceId REFERENCES Service(ServiceId)
Foreign Key PartId REFERENCES Part(PartId)
```

Credit 5d

Creating the Customer table

```
CREATE TABLE Customer (
    CustomerId INT PRIMARY KEY,
    Name VARCHAR(255)
);
```

Creating the Motorcycle table

```
CREATE TABLE Motorcycle (
    VIN VARCHAR(255) PRIMARY KEY,
    Make VARCHAR(100),
    Model VARCHAR(100),
    Year INT,
    EngineCapacity INT
);
```

Creating the Service table

```
CREATE TABLE Service (
    ServiceId INT PRIMARY KEY,
    Date DATE,
    Location VARCHAR(255),
    TotalCost DECIMAL(10, 2)
);
```

Creating the Task table

```
CREATE TABLE Task (
    TaskId INT PRIMARY KEY,
    Description VARCHAR(255),
    HourlyRate DECIMAL(10, 2)
);
```

Creating the Part table

```
CREATE TABLE Part (
    PartId INT PRIMARY KEY,
    Name VARCHAR(255),
    UnitPrice DECIMAL(10, 2)
);
```

Creating the Ownership table

```
CREATE TABLE Ownership (
    CustomerId INT,
    VIN VARCHAR(255),
    StartDate DATE,
    EndDate DATE,
    PRIMARY KEY (CustomerId, VIN),
    FOREIGN KEY (CustomerId) REFERENCES Customer(CustomerId),
    FOREIGN KEY (VIN) REFERENCES Motorcycle(VIN)
);
```

Creating the ServiceTask table

```
CREATE TABLE ServiceTask (
    TaskId INT,
    ServiceId INT,
    Hours DECIMAL(10, 2),
    PRIMARY KEY (TaskId, ServiceId),
    FOREIGN KEY (TaskId) REFERENCES Task(TaskId),
    FOREIGN KEY (ServiceId) REFERENCES Service(ServiceId)
);
```

Creating the ServicePart table

```
CREATE TABLE ServicePart (
    Quantity INT,
    ServiceId INT,
    PartId INT,
    PRIMARY KEY (ServiceId, PartId),
    FOREIGN KEY (ServiceId) REFERENCES Service(ServiceId),
    FOREIGN KEY (PartId) REFERENCES Part(PartId)
);
```

Credit 5e

Customer Table

CustId	Name	Phone
125	John Coles	0401112233
278	Erin Trump	0466121455
721	Emma Knox	0423544117

Car Table

CarRego	**MakeModel**
1AU8HK	Mazda 3
1LM3AB	Hyundai i30
1KA2CA	Toyota Camry
1CZ8JK	Mazda 3

Rental Table

CustId	**CarRego**	**StartDate**	**ReturnDate**
125	1AU8HK	2020-08-31	2020-09-07
125	1LM3AB	2020-11-14	2020-11-21
278	1AU8HK	2020-09-12	2020-09-19
278	1KA2CA	2020-10-01	2020-10-08
278	1CZ8JK	2020-11-10	2020-11-12
278	1AU8HK	2020-11-26	2020-12-01
721	1LM3AB	2020-09-10	2020-09-13

Credit 5f

```
*start transaction for the purchase

START TRANSACTION;


UPDATE Product

SET QtyInStock = QtyInStock – 2

WHERE ProdID = ‘G43546’;

*check if the update was successful

SELECT QtyInStock FROM Product WHERE ProdId = ‘G43546’;

COMMIT;
```

```
*start transaction for the return

START TRANSACTION;

UPDATE Product

SET QtyInStock – QtyInStock + 1

WHERE ProdID = ‘G43546’;

*check if the update was successful

SELECT QtyInStock FROM Product WHERE ProdID = ‘G43546’;

COMMIT;
```

Explanation of Transaction Commit and Rollback:

1. **Transaction Committed:**
   A transaction is committed when all the operations within the transaction are successfully completed without any errors. Committing the transaction writes all changes made during the transaction to the database. This means that these changes become permanent and visible to other users.
2. **Transaction Rollback:**
   A transaction is rolled back if any operation within the transaction fails or if a condition is met that invalidates the transaction (like insufficient stock). Rolling back a transaction undoes all changes made during the transaction, returning the database to its previous state before the transaction began.

Smooth Operation (Commit): If the update operations for both purchasing and returning the product adjust the ‘**QtyInStock’** correctly without violating any constraints (like inventory going below 0), the transactions are committed, making these changes permanent.

Problematic Operation (Rollback): If there’s an issue during the transaction, such as attempting to sell more units than are available in stock, the transaction should be rolled back to avoid corrupting the database state.