INF10002 Database Analysis and Design

Task 5 – Credit Submission

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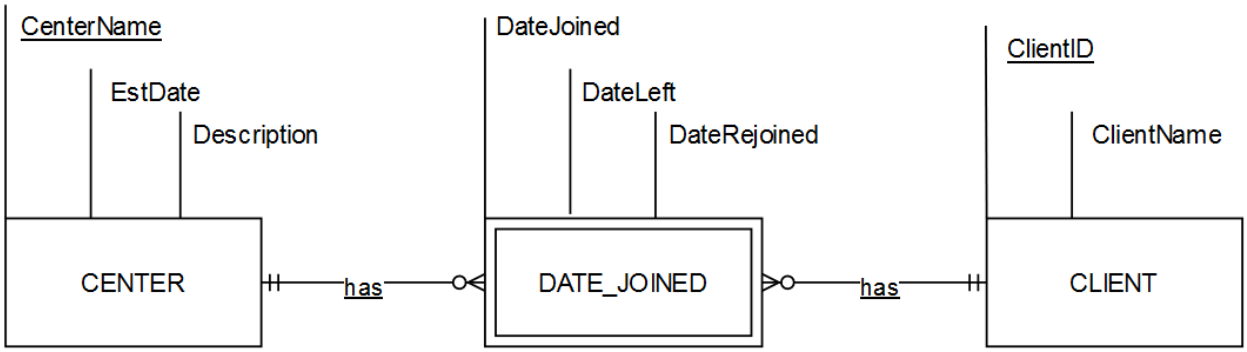
Step 1
Paste your screen capture(s) for this task here.



CENTER (CenterName, EstDate, Description)

PRIMARY KEY (CenterName)

CLIENT (ClientID, ClientName)

PRIMARY KEY (ClientID)

DATE_JOINED (DateJoined, DateLeft, DateRejoined, CenterName, ClientID)

PRIMARY KEY (CenterName, ClientID)

FOREIGN KEY (CenterName) REFERENCES CENTER

FOREIGN KEY (ClientID) REFERENCES CLIENT

CENTER

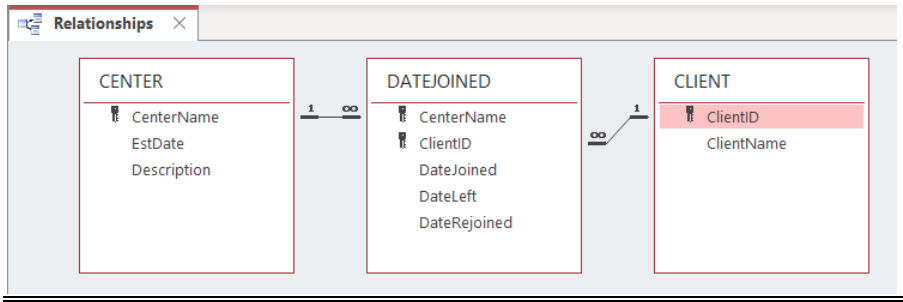
CenterName	EstDate	Description
Center 1	1/1/2020	Open year-round
Center 2	1/1/2021	Open in summer only
Center 3	1/1/2022	Open in spring and summer

CLIENT

ClientID	ClientName
1	Cristiano Ronaldo
2	Lionel Messi
3	Neymar Jr.

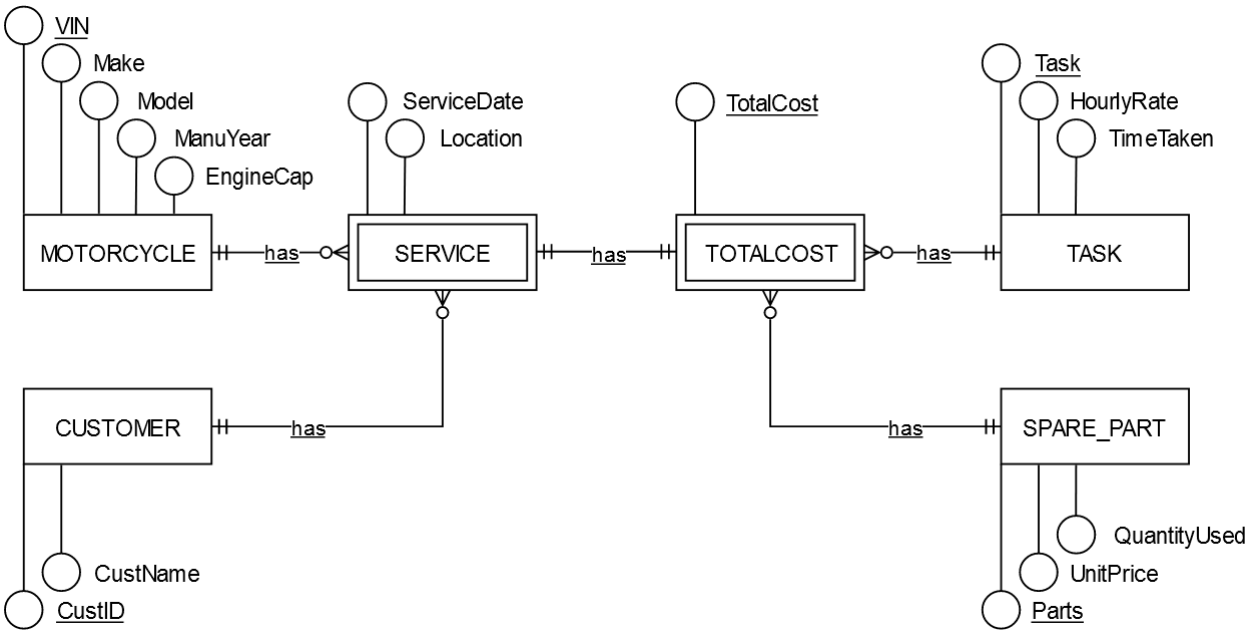
DATEJOINED

CenterName	ClientID	DateJoined	DateLeft	DateRejoinec
Center 1	1	1/1/2022		
Center 2	2	1/2/2022	2/28/2022	
Center 3	3	1/3/2022	3/31/2022	4/1/2022



Step 2

Paste your screen capture(s) for this task here.



Step 3

Paste your screen capture(s) for this task here.

MOTORCYCLE (VIN, Make, Model, ManuYear, EngineCap)

PRIMARY KEY (VIN)

CUSTOMER (CustID, CustName)

PRIMARY KEY (CustID)

TASK (Task, HourlyRate, TimeTaken)

PRIMARY KEY (Task)

SPARE_PART (Parts, UnitPrice, QuantityUsed)

PRIMARY KEY (Parts)

TOTALCOST (TotalCost, Task, Parts)

PRIMARY KEY (TotalCost, Task, Parts)

FOREIGN KEY (Task) REFERENCES TASK

FOREIGN KEY (Parts) REFERENCES SPARE_PART

SERVICE (ServiceDate, Location, VIN, CustID, TotalCost, Task, Parts)

PRIMARY KEY (VIN, CustID, TotalCost, Task, Parts)

FOREIGN KEY (VIN) REFERENCES MOTORCYCLE

FOREIGN KEY (CustID) REFERENCES CUSTOMER

FOREIGN KEY (TotalCost) REFERENCES TOTALCOST

FOREIGN KEY (Task) REFERENCES TOTALCOST

FOREIGN KEY (Parts) REFERENCES TOTALCOST

Step 4

Paste your screen capture(s) for this task here.

```
CREATE TABLE MOTORCYCLE (
   VIN NUMERIC,
   MAKE VARCHAR(30),
   MODEL VARCHAR (30),
   MANUYEAR DATE,
   ENGINECAP NUMERIC,
   PRIMARY KEY (VIN)
);
```

```
CREATE TABLE CUSTOMER (
    CUSTID NUMERIC,
    CUSTNAME VARCHAR(30),
    PRIMARY KEY (CUSTID)
);

CREATE TABLE TASK (
    TASK VARCHAR(20),
    HOURLYRATE NUMERIC,
    TIMETAKEN NUMERIC,
    PRIMARY KEY (TASK)
);

CREATE TABLE SPARE_PART (
    PARTS VARCHAR(20),
    UNITPRICE NUMERIC,
    QUANTITYUSED NUMERIC,
    PRIMARY KEY (PARTS)
);

CREATE TABLE TOTALCOST (
    TOTALCOST NUMERIC,
    TASK VARCHAR(30),
    PARTS VARCHAR (20),
    PRIMARY KEY (TOTALCOST, TASK, PARTS),
    FOREIGN KEY (TASK) REFERENCES TASK,
    FOREIGN KEY (PARTS) REFERENCES SPARE_PART
);

CREATE TABLE SERVICE (
    SERVICEDATE DATE,
```

LOCATION VARCHAR(50),

VIN NUMERIC,

CUSTID NUMERIC,

TOTALCOST NUMERIC,

TASK VARCHAR(20),

PARTS VARCHAR(20),

PRIMARY KEY (VIN, CUSTID, TOTALCOST, TASK, PARTS),

FOREIGN KEY (VIN) REFERENCES MOTORCYCLE,

FOREIGN KEY (CUSTID) REFERENCES CUSTOMER,

FOREIGN KEY (TOTALCOST) REFERENCES TOTALCOST,

FOREIGN KEY (TASK) REFERENCES TOTALCOST,

FOREIGN KEY (PARTS) REFERENCES TOTALCOST

);

Step 5

Paste your screen capture(s) for this task here.

1NF

CustId	Name	Phone	CarReg	MakeModel	StartDate	ReturnDate
125	John Coles	0401112233	1AU8HK	Mazda 3	31/08/2020	7/09/2020
125	John Coles	0401112233	1LM3AB	Hyundai i30	14/11/2020	21/11/2020
278	Erin Trump	0466121455	1AU8HK	Mazda 3	12/09/2020	19/09/2020
278	Erin Trump	0466121455	1KA2CA	Toyota Camry	1/10/2020	8/10/2020
278	Erin Trump	0466121455	1CZ8JK	Mazda 3	10/11/2020	12/11/2020
278	Erin Trump	0466121455	1AU8HK	Mazda 3	26/11/2020	1/12/2020
721	Emma Knox	0423544117	1LM3AB	Hyundai i30	10/09/2020	13/09/2020

2NF

Customer

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

Car

CustId	CarReg	MakeModel	StartDate	ReturnDate
125	1AU8HK	Mazda 3	31/08/2020	7/09/2020
125	1LM3AB	Hyundai i30	14/11/2020	21/11/2020
278	1AU8HK	Mazda 3	12/09/2020	19/09/2020
278	1KA2CA	Toyota Camry	1/10/2020	8/10/2020
278	1CZ8JK	Mazda 3	10/11/2020	12/11/2020
278	1AU8HK	Mazda 3	26/11/2020	1/12/2020
721	1LM3AB	Hyundai i30	10/09/2020	13/09/2020

3NF

Customer

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

Car Model

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

Car Registration

CustId	CarReg	StartDate	ReturnDate
125	1AU8HK	31/08/2020	7/09/2020
125	1LM3AB	14/11/2020	21/11/2020
278	1AU8HK	12/09/2020	19/09/2020
278	1KA2CA	1/10/2020	8/10/2020

278	1CZ8JK	10/11/2020	12/11/2020
278	1AU8HK	26/11/2020	1/12/2020
721	1LM3AB	10/09/2020	13/09/2020

Step 6

Paste your screen capture(s) for this task here.

6.2 Write SQL statements

INSERT INTO Action (ActionId, ActionDateTime, Action, ProdID, ProdQty, ProdCost)

VALUES (1008, '21/01/2021', 'Purchase', 'G43546', 2, '2100.00');

UPDATE Product

SET QtyInStock = QtyInStock – 2

WHERE ProdID = 'G43546' ;

INSERT INTO Action (ActionId, ActionDateTime, Action, ProdID, ProdQty, ProdCost)

VALUES (1008, '21/01/2021', 'Return, 'G43546', -1, '2100.00');

UPDATE Product

SET QtyInStock = QtyInStock + 1

WHERE ProdID = 'G43546' ;

6.3 Explain

The sale or refund operation can go smoothly when:

- All of the operations of the transaction, including inserting a row into the Action table and updating the Product table accordingly
- The data is committed
    - All changes made by the transaction are permanent

The sale or refund operation can go wrong when:

- None of the operations of that transaction are committed, meaning no new row is inserted into the Action table and the Product table is not updated
- The data is rolled back (not committed)

The DBMS ensures that every transaction is either committed or rolled-back.

- Committing a transaction means making permanent the changes performed by the SQL statements within the transaction. The changes made by the SQL statement(s) of a transaction become permanent and visible to other users only after that transaction commits.
- A rollback is the operation of restoring a database to a previous state by cancelling a specific transaction or transaction set. Rollbacks are either performed automatically by database systems or manually by users.