

COEN 280

Database Systems

Winter 2023

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## Project Report

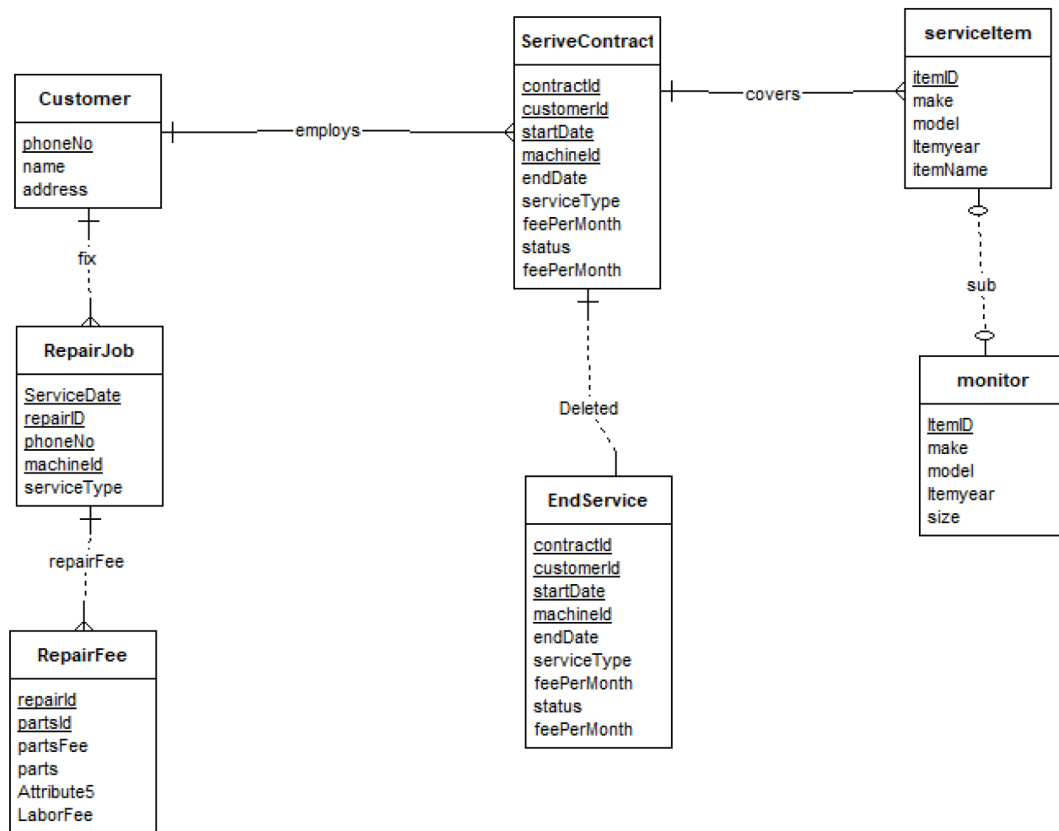
### 1. Introduction

Design and Develop a Record-maintenance System for MagicWand Inc, a company that provides computer repair and maintenance services.

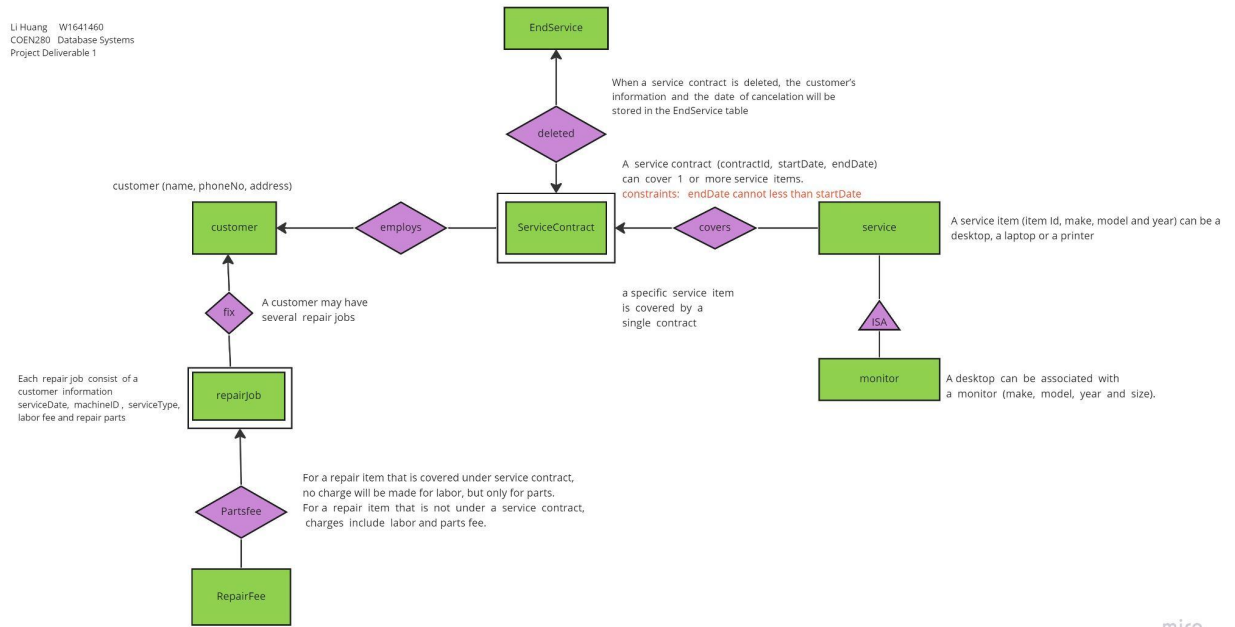
### 2. E-R model

The process of translating the E-R model into a relational model should be clearly shown with the resulting tables. Clearly identify the primary keys and foreign keys.

## 2.1 Cowfoot



## 2.2 E-R Model Diagram



miro

## 2.3 Relational Model with Tables

customer(phoneNo, name, address)

serviceItem (itemId, itemType, make, model, year)

monitor(itemId, make, model, year and size)

ServiceContract(contractId,customerId,startDate,endDate,machineId,serviceType,feePerMonth,status)

*foreign Key (customerId) refer to table customer (phoneNo)*

RepairJob(repairId, phoneNo, serviceDate,machineId,serviceType)

*foreign Key (phoneNo) refer to table customer (phoneNo)*

RepairFee(repairId, partsId, partsFee, LaborFee)

## 3. script files

a) create the tables

step 1:

Capture the session (queries and output):



```
spool 'D:\APP\Oracle\SQL\project\creatingTable.log';
```

Step 2: EXECUTE the belowing SQL command

```
@'D:\APP\Oracle\SQL\project\creatingTable.sql';
```

Step 3:

```
spool off;
```

| This PC > Documents (D:) > APP > Oracle > SQL > project   |                    |                                |      |
|---|--------------------|--------------------------------|------|
| <input type="checkbox"/> Name   | Date modified      | Type                           | Size |
|  creatingTable.log | 3/22/2023 10:45 AM | Text Document                  | 1 KB |
|  creatingTable.sql | 3/22/2023 10:51 AM | Structured Query Language file | 3 KB |

b) Create a service contract for a given customer and a machine(s):

Write a PLSQL procedure to create a service contract and add it to the SeriveContract table.

Each service contract should consist of a customer id, service contract id (a unique number), start date of service, end date of service, id of the machine covered, type of service (hardware or software), fee charged per month. This information should be passed into the procedure via parameters. The service contract, when created, has an active status. The status may be updated to inactive.

The procedure creates an instance of the contract and stores it in the appropriate table.

Creating customers and at least three service contracts. One of the service contracts should include multiple service items (a laptop, desktop etc).

step 1:

Capture the session (queries and output):



```
spool 'D:\APP\Oracle\SQL\project\servicePL.log';
```

Step 2: EXECUTE the belowing SQL command

```
@'D:\APP\Oracle\SQL\project\servicePL.sql';
```

Step 3:

```
spool off;
```

|   |                    |                                |      |
|---|--------------------|--------------------------------|------|
|  servicePL.log | 3/22/2023 10:46 AM | Text Document                  | 1 KB |
|  servicePL.sql | 3/13/2023 2:38 PM  | Structured Query Language file | 3 KB |

```
SQL> @'D:\APP\Oracle\SQL\project\servicePL.sql';
```

```
Procedure created.
```

```
PL/SQL procedure successfully completed.
```

c) Create a repair job

Write a PLSQL procedure to create a repair job.

Each repair job should consist of a customer information (name, phone, a ddress), date of service, id of the machine covered, type of service (hardware or software), if it is a service item covered and an itemized list of charges.

Creating at least two repair jobs, where one repair job has a repair item that is included in a service contract and one repair job that has a repair item with no service contract.

step 1:

Capture the session (queries and output):



```
spool 'D:\APP\Oracle\SQL\project\repairJobPL.log';
```

Step 2: EXECUTE the belowing SQL command

```
@'D:\APP\Oracle\SQL\project\repairJobPL.sql';
```

Step 3:

```
spool off;
```

|   |                    |                                |      |
|---|--------------------|--------------------------------|------|
|  repairJobPL.log | 3/22/2023 10:48 AM | Text Document                  | 1 KB |
|  repairJobPL.sql | 3/13/2023 10:36 AM | Structured Query Language file | 4 KB |

```
SQL> @'D:\APP\Oracle\SQL\project\repairJobPL.sql';  
  
PL/SQL procedure successfully completed.  
  
SQL> spool off;
```

For a repair item that is covered under service contract, no charge will be made for labor, but only for parts (if they are required). For a repair item that is not under a service contract, charges include labor and parts.

```
FOR i IN 1..parts_v.COUNT LOOP  
  IF (serv_Num > 0) THEN  
    --if the repair item under service contract,no charge will be made for labor.  
    INSERT into RepairFee(repairId, partsId, parts, partsFee, LaborFee)  
    VALUES  
    (repairId_v,i, parts_v(i),partsFee_v(i),0);  
  ELSE  
    INSERT into RepairFee(repairId, partsId, parts, partsFee, LaborFee)  
    VALUES  
    (repairId_v,i, parts_v(i),partsFee_v(i),LaborFee_v(i));  
  end If;  
END LOOP;
```



## 4. Spool File

a) Display a service contract by contract id.

EXECUTE the belowing SQL command

```
@'D:\APP\Oracle\SQL\project\serviceContractByID.sql';
```

Get a report in 'D:\APP\Oracle\SQL\project\serviceContractByID.html'

|  |                   |                                |      |
|--|-------------------|--------------------------------|------|
|  serviceContractByID.html | 3/13/2023 2:58 PM | Chrome HTML Document           | 3 KB |
|  serviceContractByID.sql  | 3/13/2023 2:58 PM | Structured Query Language file | 2 KB |

| Service Contract Report |             |                       |                     |                       |                 |                       |
|-------------------------|-------------|-----------------------|---------------------|-----------------------|-----------------|-----------------------|
| Service Contract_id     | Customer Id | Start_Date of_Service | End_Date of_Service | id_of_Machine Covered | Type_of Service | Fee_Charged Per_Month |
| SC000001                | 6503502234  | 01-JAN-22             | 31-DEC-22           | T001                  | hardware        | 15.00                 |
|                         | 6503502234  | 01-JAN-22             | 31-DEC-22           | T002                  | software        | 10.00                 |
|                         | 6503502234  | 01-JAN-22             | 31-DEC-22           | T003                  | hardware        | 15.00                 |
| SC000002                | 6504502235  | 01-JAN-22             | 31-DEC-22           | T001                  | hardware        | 15.00                 |
|                         | 6504502235  | 01-JAN-22             | 31-DEC-22           | T001                  | software        | 10.00                 |
| SC000003                | 8504502236  | 01-JAN-23             | 31-DEC-23           | T001                  | hardware        | 15.00                 |
| SC000004                | 6504502235  | 01-JAN-23             | 31-DEC-23           | T002                  | hardware        | 15.00                 |
| For Management Only     |             |                       |                     |                       |                 |                       |



b) Display all the service contracts for a specific customer (by phone).

EXECUTE the belowing SQL command to generate a report

@'D:\APP\Oracle\SQL\project\serviceContractByPhone.sql';

Enter the prompt: 6504502235,

Get a report in 'D:\APP\Oracle\SQL\project\serviceContractByPhone.html'

|   |                   |                                |      |
|---|-------------------|--------------------------------|------|
|  serviceContractByPhone.html | 3/13/2023 2:59 PM | Chrome HTML Document           | 2 KB |
|  serviceContractByPhone.sql  | 3/13/2023 2:37 PM | Structured Query Language file | 2 KB |



| Enter customer phone number: 6504502235 |                     |                       |                     |                       |                 |                       |
|---|---------------------|-----------------------|---------------------|-----------------------|-----------------|-----------------------|
| Service Contract Report                 |                     |                       |                     |                       |                 |                       |
| Customer Id                             | Service Contract_id | Start_Date of_Service | End_Date of_Service | id_of_Machine Covered | Type_of Service | Fee_Charged Per_Month |
| 6504502235                              | SC000002            | 01-JAN-22             | 31-DEC-22           | T001                  | hardware        | 15.00                 |
| 6504502235                              | SC000002            | 01-JAN-22             | 31-DEC-22           | T001                  | software        | 10.00                 |
| 6504502235                              | SC000004            | 01-JAN-23             | 31-DEC-23           | T002                  | hardware        | 15.00                 |
| For Management Only                     |                     |                       |                     |                       |                 |                       |

c) Display a repair job. This should include all the information about customer, each repair item and the itemized bill.

EXECUTE the belowing SQL command

@'D:\APP\Oracle\SQL\project\repairJobReport.sql';

Get a report in 'D:\APP\Oracle\SQL\project\repairJobReport.html'

|  |                   |                                |      |
|--|-------------------|--------------------------------|------|
|  repairJobReport.html | 3/13/2023 3:05 PM | Chrome HTML Document           | 4 KB |
|  repairJobReport.sql  | 3/13/2023 3:05 PM | Structured Query Language file | 2 KB |



| Repair Job Report   |               |                  |             |              |            |              |              |           |           |
|---------------------|---------------|------------------|-------------|--------------|------------|--------------|--------------|-----------|-----------|
| Customer Phone      | Customer Name | Customer Address | RepairId Id | Service Date | Machine Id | Service Type | Repair Parts | Parts Fee | Labor Fee |
| 6503502234          | Mike          | San Jose         | RJ000001    | 01-MAY-22    | T002       | software     | CPU          | 300.00    | .00       |
|                     | Mike          | San Jose         | RJ000001    | 01-MAY-22    | T002       | software     | Memory       | 200.00    | .00       |
|                     | Mike          | San Jose         | RJ000001    | 01-MAY-22    | T002       | software     | Screen       | 100.00    | .00       |
| 6503502238          | Rose          | Santa Clara      | RJ000002    | 01-APR-22    | T002       | software     | OS           | 250.00    | 200.00    |
|                     | Rose          | Santa Clara      | RJ000002    | 01-APR-22    | T002       | software     | Processes    | 500.00    | 300.00    |
| 6503502239          | Lucy          | Santa Clara      | RJ000003    | 10-MAY-22    | T001       | Hardware     | Speaker      | 150.00    | 100.00    |
|                     | Lucy          | Santa Clara      | RJ000003    | 10-MAY-22    | T001       | Hardware     | Camera       | 150.00    | 100.00    |
| For Management Only |               |                  |             |              |            |              |              |           |           |

d) Display the number of active service contracts and the total revenue generated each month by these contracts.

EXECUTE the belowing SQL command

@'D:\APP\Oracle\SQL\project\serviceContractTotal.sql';

Get a report in'D:\APP\Oracle\SQL\project\serviceContractTotal.html'

|   |                   |                                |      |
|---|-------------------|--------------------------------|------|
|  serviceContractTotal.html | 3/13/2023 3:21 PM | Chrome HTML Document           | 4 KB |
|  serviceContractTotal.sql  | 3/13/2023 3:20 PM | Structured Query Language file | 2 KB |

| Service Contract Report |             |                       |                     |                       |                 |                       |
|-------------------------|-------------|-----------------------|---------------------|-----------------------|-----------------|-----------------------|
| Service Contract_id     | Customer Id | Start_Date of_Service | End_Date of_Service | id_of_Machine Covered | Type_of Service | Fee_Charged Per_Month |
| SC000001                | 6503502234  | 01-JAN-22             | 31-DEC-22           | T001                  | hardware        | 15.00                 |
| SC000001                | 6503502234  | 01-JAN-22             | 31-DEC-22           | T002                  | software        | 10.00                 |
| SC000001                | 6503502234  | 01-JAN-22             | 31-DEC-22           | T003                  | hardware        | 15.00                 |
| SC000002                | 6504502235  | 01-JAN-22             | 31-DEC-22           | T001                  | hardware        | 15.00                 |
| SC000002                | 6504502235  | 01-JAN-22             | 31-DEC-22           | T001                  | software        | 10.00                 |
| SC000003                | 8504502236  | 01-JAN-23             | 31-DEC-23           | T001                  | hardware        | 15.00                 |
| SC000004                | 6504502235  | 01-JAN-23             | 31-DEC-23           | T002                  | hardware        | 15.00                 |
|                         |             |                       |                     |                       |                 | -----                 |
| count                   |             |                       |                     |                       |                 | 7                     |
| sum                     |             |                       |                     |                       |                 | 95.00                 |
| For Management Only     |             |                       |                     |                       |                 |                       |

e) Display the total revenue generated in a specific month by all the repair jobs.



EXECUTE the belowing SQL command

@'D:\APP\Oracle\SQL\project\RevenueReport.sql';

Enter the prompt: 2022-05



Get a report in 'D:\APP\Oracle\SQL\project\RevenueReport.html'

|  |                   |                                |      |
|--|-------------------|--------------------------------|------|
|  RevenueReport.html | 3/13/2023 3:25 PM | Chrome HTML Document           | 3 KB |
|  RevenueReport.sql  | 3/13/2023 3:25 PM | Structured Query Language file | 2 KB |

Enter year and month yyyy-mm: 2022-05

| Repair Revenue Report |             |              |            |              |              |           |           |
|-----------------------|-------------|--------------|------------|--------------|--------------|-----------|-----------|
| Customer Phone        | RepairId Id | Service Date | Machine Id | Service Type | Repair Parts | Parts Fee | Labor Fee |
| 6503502234            | RJ000001    | 01-MAY-22    | T002       | software     | CPU          | 300.00    | .00       |
| 6503502234            | RJ000001    | 01-MAY-22    | T002       | software     | Memory       | 200.00    | .00       |
| 6503502234            | RJ000001    | 01-MAY-22    | T002       | software     | Screen       | 100.00    | .00       |
| 6503502239            | RJ000003    | 10-MAY-22    | T001       | Hardware     | Speaker      | 150.00    | 100.00    |
| 6503502239            | RJ000003    | 10-MAY-22    | T001       | Hardware     | Camera       | 150.00    | 100.00    |
|                       |             |              |            |              |              |           |           |
| TOTAL                 |             |              |            |              |              | 900.00    | 200.00    |

For Management Only

## 5. Constraints

- a) In the service contract, the end date cannot be less than the start date of the contract.

```

CREATE TABLE ServiceContract (
  customerId char(10),
  contractId char(10),
  startDate DATE,
  endDate DATE,
  machineId char(10),
  serviceType VARCHAR(20),
  feePerMonth REAL,
  status VARCHAR(20) DEFAULT 'active',
  PRIMARY Key(customerId, contractId, machineId, serviceType),
  CHECK (endDate >= startDate)
);

```

When creating the table ServiceContract, add CHECK (endDate >= startDate)

- b) When a service contract is deleted, the customer's information and the date of cancelation, should be recorded (in a separate table) automatically.



step 1:

Capture the session (queries and output):

spool 'D:\APP\Oracle\SQL\project\trigger.log';

Step 2: EXECUTE the belowing SQL command  
`@'D:\APP\Oracle\SQL\project\trigger.sql';`

Step 3:  
`spool off;`

|   |                    |                                |      |
|---|--------------------|--------------------------------|------|
|  trigger.log | 3/22/2023 10:50 AM | Text Document                  | 1 KB |
|  trigger.sql | 3/11/2023 10:31 PM | Structured Query Language file | 1 KB |

```
SQL> @'D:\APP\Oracle\SQL\project\trigger.sql';
```

```
Table dropped.
```

```
Table created.
```

```
Trigger created.
```