SQL Data Engineer Assessment (Module 2)

CONCEPTUAL, LOGICAL AND PHYSICAL DATABASE DESIGN

Entities & Attributes

Properties:

- Types
- Representative
- Area
- Regulations

Representatives/Employees:

- Properties
- Supervisor
- Customers
- Areas
- Whether supervisor or not
- Whether chief salesperson or not

Customers:

- Buying or selling
- Name
- Info
- Representative

Area:

- Customers
- Representative
- Chief salesperson
- Performance

Attributes & Datatypes:

Property:

- Prop_id CHAR(4) PK
- Prop_type_id CHAR(2) FK
- Prop_info
- Area_id CHAR(4) FK
- sales rep_no INT FK (one-to-one)

Employees:

- emp_no PK
- emp_info (one-to-one)

Teams:

- team_id PK
- emp_no (many-to-one)

Area:

- area_id PK
- area_name
- emp_id FK (area chief)
- performance
- Target

Customers:

- Cust_id PK
- Cust_name
- Cust_info
- Salesrep_no FK
- service_type (buy/sell)

Supervisor: (Lookup Table)

- Super_id PK
- supervisor_emp_no FK
- team_id
- from_date
- to_date

Lookup Table:

Regulations (Lookup Table)

- reg_id VARCHAR(6)
- reg_name VARCHAR(40) (one-to-one)

🟨 Safety first: the role of health and safety in property management

Commercial: 🔺 Guide to commercial landlord laws and regulations | Alan Boswell Group

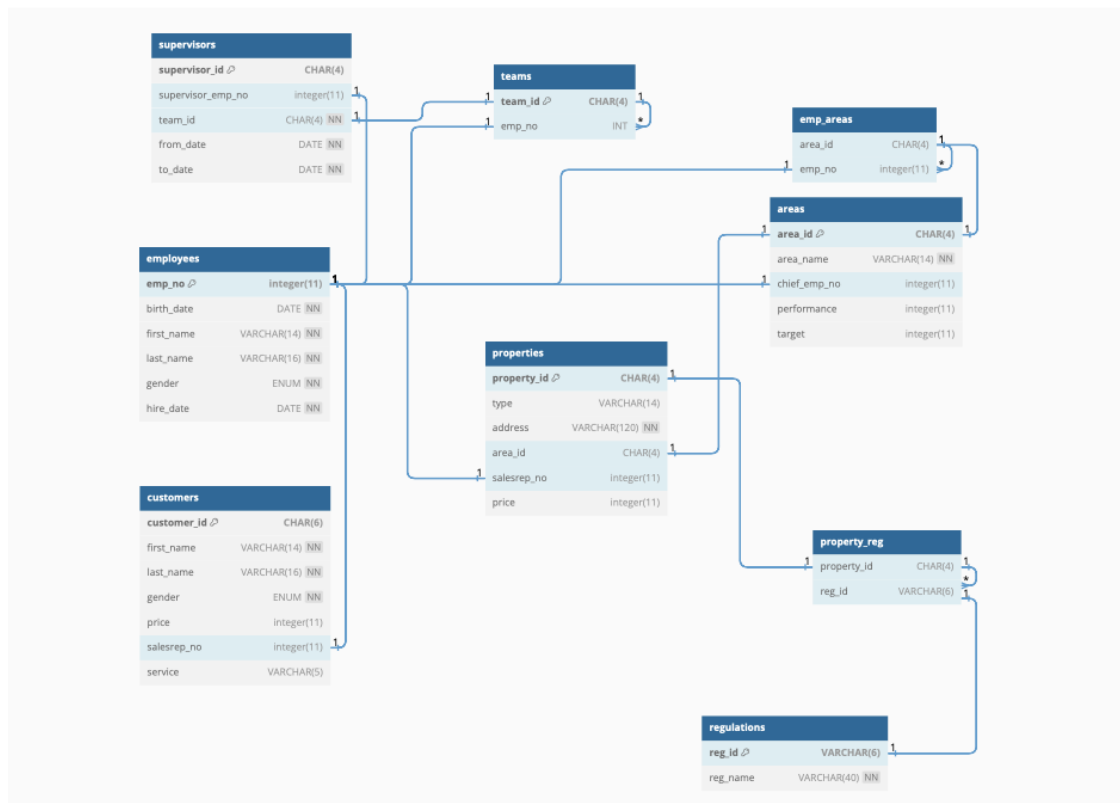⚠ Health and Safety - Leasehold Information Sheet

Bridge Table:

Emp_areas

- area_id FK
- emp_no FK (many-to-one)

Property_reg

- property_id FK
- reg_id FK (many-to-one)

Physical Data Model

The key symbol represents the primary key.

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🔀 A Free Database Designer for Developers and Analysts

CREATE DATABASE SCRIPT FOR MYHOMES DATABASE

```sql
1   DROP DATABASE IF EXISTS myhomes;
2   CREATE DATABASE IF NOT EXISTS myhomes;
3   USE myhomes;
4   SELECT 'CREATING DATABASE STRUCTURE' as 'INFO'; DROP TABLE IF EXISTS
5   employees,
6   teams,
7   supervisors,
8   areas,
9   emp_areas,
10  properties,
11  customers,
12  regulations,
13  property_reg;
14
15  CREATE TABLE employees (
16    emp_no INT NOT NULL,
17    birth_date DATE NOT NULL,
18    first_name VARCHAR(14) NOT NULL,
19    last_name VARCHAR(16) NOT NULL,
20    gender ENUM ('M','F') NOT NULL,
21    hire_date DATE NOT NULL,
22    PRIMARY KEY (emp_no)
23  );
24
25  CREATE TABLE teams (
26    team_id CHAR(4),
27    emp_no INT NOT NULL,
28    PRIMARY KEY (team_id, emp_no)
29  );
30
31  CREATE TABLE supervisors (
32    super_id CHAR(4),
33    super_emp_no INT NOT NULL,
34    team_id CHAR(4) NOT NULL,
35    from_date DATE NOT NULL,
36    to_date DATE NOT NULL,
37    PRIMARY KEY (super_id, super_emp_no, team_id)
38  );
39
40  CREATE TABLE areas (
41    area_id CHAR(4) NOT NULL,
42    area_name VARCHAR(14) NOT NULL,
43    chief_emp_no INT NOT NULL,
44    performance INT NOT NULL,
45    target INT NOT NULL,
46    PRIMARY KEY (area_id, chief_emp_no)
47  );
48
49  CREATE Table emp_areas (
50    area_id CHAR(4),
51    emp_no INT,
52    PRIMARY KEY (area_id, emp_no)
53  );
54
55  CREATE TABLE properties (
56    property_id CHAR(4) NOT NULL,
```

```sql
    type VARCHAR(20),
    address VARCHAR(120) NOT NULL,
    area_id CHAR(4) NOT NULL,
    salesrep_no INT NOT NULL,
    price INT,
    PRIMARY KEY (property_id, salesrep_no, area_id),
    UNIQUE KEY (address)
);

CREATE TABLE customers (
    customer_id CHAR(6) NOT NULL,
    first_name VARCHAR(14) NOT NULL,
    last_name VARCHAR(16) NOT NULL,
    gender ENUM ('M','F') NOT NULL,
    price INT,
    salesrep_no INT NOT NULL,
    service VARCHAR(5) NOT NULL,
    PRIMARY KEY (customer_id, salesrep_no)
);

CREATE TABLE regulations (
    reg_id VARCHAR(6) NOT NULL,
    reg_name VARCHAR(50) NOT NULL,
    PRIMARY KEY (reg_id),
    UNIQUE KEY (reg_name)
);

CREATE TABLE property_reg (
    property_id CHAR(4),
    reg_id VARCHAR(6),
    PRIMARY KEY (property_id, reg_id)
);

ALTER TABLE teams ADD FOREIGN KEY (emp_no) REFERENCES employees (emp_no);

ALTER TABLE supervisors ADD FOREIGN KEY (team_id) REFERENCES teams (team_id);

ALTER TABLE supervisors ADD FOREIGN KEY (super_emp_no) REFERENCES employees (emp_no);

ALTER TABLE areas ADD FOREIGN KEY (chief_emp_no) REFERENCES employees (emp_no);

ALTER TABLE emp_areas ADD FOREIGN KEY (area_id) REFERENCES areas (area_id);

ALTER TABLE emp_areas ADD FOREIGN KEY (emp_no) REFERENCES employees (emp_no);

ALTER TABLE properties ADD FOREIGN KEY (area_id) REFERENCES areas (area_id);

ALTER TABLE properties ADD FOREIGN KEY (salesrep_no) REFERENCES employees (emp_no);

ALTER TABLE customers ADD FOREIGN KEY (salesrep_no) REFERENCES employees (emp_no);

ALTER TABLE property_reg ADD FOREIGN KEY (property_id) REFERENCES properties (property_id);

ALTER TABLE property_reg ADD FOREIGN KEY (reg_id) REFERENCES regulations (reg_id);
```

INSERT INTO SCRIPT FOR MYHOMES DATABASE

```sql
1  INSERT INTO employees VALUES (10001, '1988-06-28', 'Oscar', 'Smith', 'M', '2008-01-02'),
2  (10002, '1990-10-10', 'Angela', 'James', 'F', '2018-12-01'),
3  (10003, '1983-06-06', 'Aidah', 'McMit', 'F', '1998-12-01'),
4  (10004, '1998-07-01', 'Sarah', 'Williams', 'F', '2019-09-21'),
5  (10005, '1992-05-12', 'Emma', 'Khan', 'F', '2013-10-04'),
6  (10006, '1989-01-08', 'Paul', 'Waters', 'M', '2004-09-16'),
7  (10007, '1991-09-14', 'Teddy', 'Do', 'F', '2009-06-28'),
8  (10008, '1997-07-08', 'Carlos', 'Santana', 'M', '2016-09-12'),
9  (10009, '1985-11-11', 'Salvatore', 'Gotti', 'M', '2000-03-10'),
10 (10010, '1999-02-14', 'Daire', "O'Conner", 'F', '2020-09-16');
11
12 INSERT INTO teams VALUES ('t001', 10001),
13 ('t001', 10004),
14 ('t002', 10005),
15 ('t002', 10007),
16 ('t002', 10008),
17 ('t003', 10002),
18 ('t003', 10010);
19
20 INSERT INTO supervisors VALUES ('s001', 10003, 't001', '2011-12-01', '9999-01-01'),
21 ('s002', 10006, 't002', '2012-12-10', '2015-10-10'),
22 ('s003', 10009, 't003', '2009-07-01', '2022-12-10');
23
24 INSERT INTO areas VALUES ('a001', 'Rotherhithe', 10003, 5000000, 6000000),
25 ('a002', 'Peckham', 10001, 2500000, 2000000),
26 ('a003', 'Deptford', 10004, 2000000, 3500000),
27 ('a004', 'Lewisham', 10007, 3500000, 2000000),
28 ('a005', 'Bermondsey', 10010, 500000, 300000),
29 ('a006', 'Surrey Quays', 10005, 6000000, 6000000),
30 ('a007', 'New Cross', 10008, 4550000, 6000000),
31 ('a008', 'East Dulwich', 10002, 6000000, 4000000);
32
33 INSERT INTO emp_areas VALUES ('a001', 10002),
34 ('a001', 10003),
35 ('a002', 10001),
36 ('a003', 10004),
37 ('a004', 10007),
38 ('a004', 10010),
39 ('a005', 10010),
40 ('a005', 10006),
41 ('a005', 10002),
42 ('a006', 10005),
43 ('a007', 10009),
44 ('a007', 10008),
45 ('a008', 10002);
46
47 INSERT INTO properties VALUES ('p001', 'house', 'Eleanor Close, SE16 7JE','a001', 10002, 550000),
48 ('p002', 'flat', 'Flat 12 Amber House, SE16 4RT', 'a005', 10010, 450000),
49 ('p003', 'bunglow', 'Silvester Road, SE22 9PF', 'a008', 10002, 700000),
50 ('p004', 'land', '70-72 Pentonville Road, SE14 5AG', 'a007', 10009, 1500000),
51 ('p005', 'commercial_property','Unit 6, Elizabeth Industrial Estate, SE14 5RW' , 'a006', 10005, 1000000),
52 ('p006', 'house', 'Pepys Road, SE14 5SE', 'a007', 10009, 650000),
53 ('p007', 'flat', 'Elm Grove, SE15 5DE', 'a002', 10001, 475000),
54 ('p008', 'commercial_property', '901-903 Upland Road, SE22 0DP' , 'a008', 10002, 1200000);
55
56 INSERT INTO customers VALUES
```

```
57  ('c0001', 'Beyonce', 'Knowles', 'F', 450000, 10002, 'buy'),
58  ('c0002', 'Rihanna', 'Fenty', 'F', NULL, 10006, 'sell'),
59  ('c0003', 'Lebron', 'James', 'M', NULL, 10004, 'sell'),
60  ('c0004', 'Cristiano', 'Ronaldo', 'M', 1000000, 10008, 'buy'),
61  ('c0005', 'Kylian', 'Mbappe', 'F', 3000000, 10005, 'buy'),
62  ('c0006', 'Bukayo', 'Saka', 'M', NULL, 10010, 'sell'),
63  ('c0007', 'Ed', 'Sheeran', 'M', NULL, 10007, 'sell'),
64  ('c0008', 'Zayn', 'Malik', 'F', NULL, 10009, 'sell');
65
66  INSERT INTO regulations VALUES ('BS22', 'Building Safety Act'),
67  ('FS22', 'Fire Safety Act'),
68  ('WS', 'Water Safety'),
69  ('ES', 'Electrical Safety'),
70  ('GSIU', 'Gas Safety (Installation & Use) Regulation 1998'),
71  ('MEES', 'Minimum Energy Efficiency Standard'),
72  ('RRFS', 'Regulatory Reform (Fire Safety) Order 2005');
73
74  INSERT INTO property_reg VALUES ('p001', 'BS22'),
75  ('p001', 'FS22'),
76  ('p002', 'FS22'),
77  ('p002', 'WS'),
78  ('p002', 'ES'),
79  ('p003', 'BS22'),
80  ('p003', 'FS22'),
81  ('p003', 'WS'),
82  ('p005', 'ES'),
83  ('p005', 'MEES'),
84  ('p005', 'RRFS'),
85  ('p005', 'GSIU'),
86  ('p007', 'BS22'),
87  ('p007', 'GSIU'),
88  ('p007', 'ES'),
89  ('p008', 'MEES'),
90  ('p008', 'RRFS'),
91  ('p008', 'GSIU');
92
```

Questions

1. Display names of representatives, details of the properties they represent, and names of their supervisors.

```
1   WITH emp_prop AS
2   (SELECT CONCAT(e.first_name, ' ', e.last_name) AS full_name, p.*
3   FROM employees e
4   LEFT JOIN properties p ON p.salesrep_no = e.emp_no),
5   super_name AS
6   (SELECT s.super_id, CONCAT(e.first_name, ' ', e.last_name) AS full_name, s.team_id
7   FROM supervisors s
8   INNER JOIN employees e ON e.emp_no = s.super_emp_no),
9   team_details AS
10  (SELECT sn.super_id, sn.full_name AS supervisor_name, CONCAT(e.first_name, ' ', e.last_name) AS team_full_name
11  FROM super_name sn
12  INNER JOIN teams t ON t.team_id= sn.team_id
13  INNER JOIN employees e ON e.emp_no = t.emp_no)
14
15  SELECT ep.*, td.supervisor_name FROM emp_prop ep
```

```
16  LEFT JOIN team_details td ON td.team_full_name = ep.full_name
17  ORDER BY full_name;
```

```
+----------------+-------------+---------------------+----------------------------------------------+---------+------------+---------+----------------+
| full_name      | property_id | type                | address                                      | area_id | salesrep_no | price  | supervisor_name |
+----------------+-------------+---------------------+----------------------------------------------+---------+------------+---------+----------------+
| Aidah McMit    | NULL        | NULL                | NULL                                         | NULL    | NULL       | NULL    | NULL           |
| Angela James   | p001        | house               | Eleanor Close, SE16 7JE                      | a001    | 10002      | 550000  | Salvatore Gotti |
| Angela James   | p003        | bunglow             | Silvester Road, SE22 9PF                     | a008    | 10002      | 700000  | Salvatore Gotti |
| Angela James   | p008        | commercial_property | 901-903 Upland Road, SE22 0DP                | a008    | 10002      | 1200000 | Salvatore Gotti |
| Carlos Santana | NULL        | NULL                | NULL                                         | NULL    | NULL       | NULL    | Paul Waters    |
| Daire O'Conner | p002        | flat                | Flat 12 Amber House, SE16 4RT                | a005    | 10010      | 450000  | Salvatore Gotti |
| Emma Khan      | p005        | commercial_property | Unit 6, Elizabeth Industrial Estate, SE14 5RW | a006    | 10005      | 1000000 | Paul Waters    |
| Oscar Smith    | p007        | flat                | Elm Grove, SE15 5DE                          | a002    | 10001      | 475000  | Aidah McMit    |
| Paul Waters    | NULL        | NULL                | NULL                                         | NULL    | NULL       | NULL    | NULL           |
| Salvatore Gotti | p004       | land                | 70-72 Pentonville Road, SE14 5AG             | a007    | 10009      | 1500000 | NULL           |
| Salvatore Gotti | p006       | house               | Pepys Road, SE14 5SE                         | a007    | 10009      | 650000  | NULL           |
| Sarah Williams | NULL        | NULL                | NULL                                         | NULL    | NULL       | NULL    | Aidah McMit    |
| Teddy Do       | NULL        | NULL                | NULL                                         | NULL    | NULL       | NULL    | Paul Waters    |
+----------------+-------------+---------------------+----------------------------------------------+---------+------------+---------+----------------+
13 rows in set (0.025 sec)
```

2. Display details of customers together with details of their areas and names of the managers of their areas.

```
1   WITH area_info AS
2   (SELECT c.*, a.*
3   FROM customers c
4   LEFT JOIN employees e ON e.emp_no = c.salesrep_no
5   INNER JOIN emp_areas ea ON ea.emp_no = e.emp_no
6   INNER JOIN areas a ON a.area_id = ea.area_id)
7
8   SELECT ai.*, CONCAT(e.first_name, ' ', e.last_name) AS chief_full_name
9   FROM area_info ai
10  INNER JOIN employees e ON e.emp_no = ai.chief_emp_no;
```

customer_id	first_name	last_name	gender	price	salesrep_no	service	area_id	area_name	chief_emp_no	performance	target	chief_full_name
c0001	Beyonce	Knowles	F	450000	10002	buy	a001	Rotherhithe	10003	5000000	6000000	Aidah McMit
c0001	Beyonce	Knowles	F	450000	10002	buy	a005	Bermondsey	10010	500000	300000	Daire O'Conner
c0001	Beyonce	Knowles	F	450000	10002	buy	a008	East Dulwich	10002	6000000	4000000	Angela James
c0002	Rihanna	Fenty	F	NULL	10006	sell	a005	Bermondsey	10010	500000	300000	Daire O'Conner
c0003	Lebron	James	M	NULL	10004	sell	a003	Deptford	10004	2000000	3500000	Sarah Williams
c0004	Cristiano	Ronaldo	M	1000000	10008	buy	a007	New Cross	10008	4550000	6000000	Carlos Santana
c0005	Kylian	Mbappe	F	3000000	10005	buy	a006	Surrey Quays	10005	6000000	6000000	Emma Khan
c0006	Bukayo	Saka	M	NULL	10010	sell	a004	Lewisham	10007	3500000	2000000	Teddy Do
c0006	Bukayo	Saka	M	NULL	10010	sell	a005	Bermondsey	10010	500000	300000	Daire O'Conner
c0007	Ed	Sheeran	M	NULL	10007	sell	a004	Lewisham	10007	3500000	2000000	Teddy Do
c0008	Zayn	Malik	F	NULL	10009	sell	a007	New Cross	10008	4550000	6000000	Carlos Santana