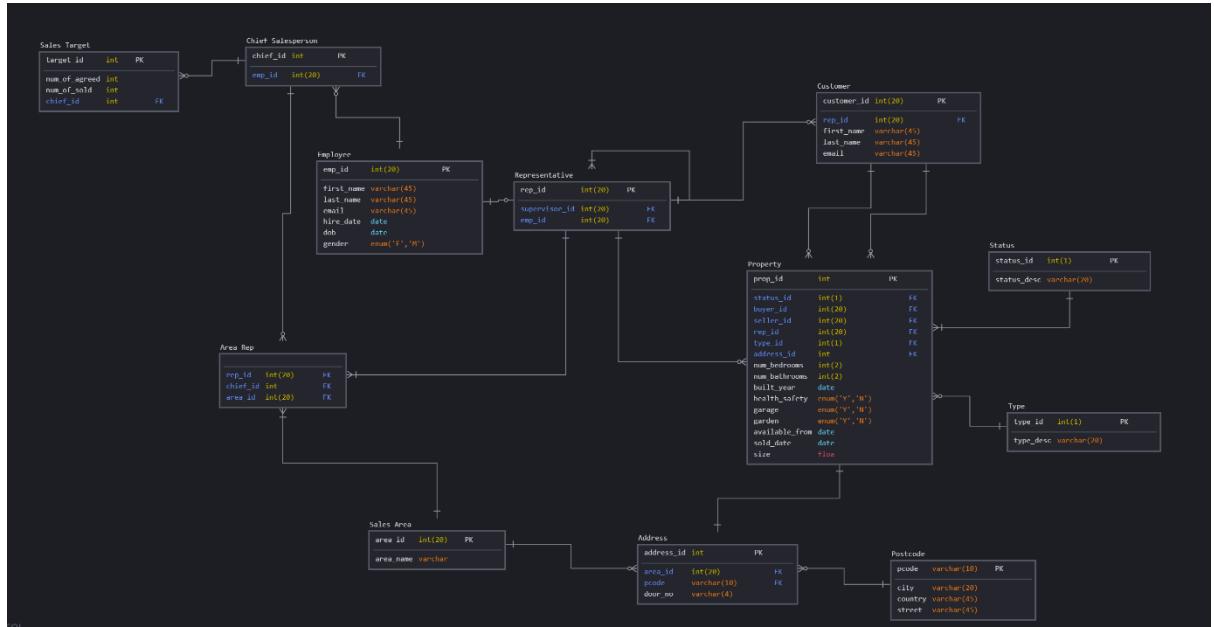


Part 1

A) Physical Model



B) Creating Tables

Creating database 'myhomes'

```
Setting environment for using XAMPP for Windows.
esraa@DESKTOP-ME1GRVL c:\xampp
# mysql -u root
Welcome to the MariaDB monitor. Commands end with ; or \g.
Your MariaDB connection id is 17
Server version: 10.4.22-MariaDB mariadb.org binary distribution

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

MariaDB [(none)]> DROP DATABASE IF EXISTS myhomes;
Query OK, 0 rows affected, 1 warning (0.001 sec)

MariaDB [(none)]> CREATE DATABASE myhomes;
Query OK, 1 row affected (0.001 sec)

MariaDB [(none)]> use myhomes;
Database changed
MariaDB [myhomes]>
```

```
MariaDB [myhomes]> DROP TABLE IF EXISTS employee,
-> representative,
-> customer,
-> property,
-> status,
-> type,
-> postcode,
-> address,
-> sales_area,
-> area_rep,
-> sales_target,
-> chief_salesperson
-> ;
```

Employee Table:

```
CREATE TABLE employee(emp_id int(20) NOT NULL,
first_name varchar(45) NOT NULL, last_name varchar(45) NOT NULL,
email varchar(45) NOT NULL, hire_date date NOT NULL,
dob date, gender ENUM ('F','M'),
PRIMARY KEY (emp_id));
```

```
MariaDB [myhomes]> CREATE TABLE employee(emp_id int(20) NOT NULL,
-> first_name varchar(45) NOT NULL,
-> last_name varchar(45) NOT NULL,
-> email varchar(45) NOT NULL,
-> hire_date date NOT NULL,
-> dob date,
-> gender ENUM ('F','M'),
-> PRIMARY KEY (emp_id));
Query OK, 0 rows affected (0.011 sec)

MariaDB [myhomes]> show tables;
+-----+
| Tables_in_myhomes |
+-----+
| employee |
+-----+
1 row in set (0.001 sec)

MariaDB [myhomes]> desc employee;
+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+
| emp_id | int(20) | NO | PRI | NULL |
| first_name | varchar(45) | NO | | NULL |
| last_name | varchar(45) | NO | | NULL |
| email | varchar(45) | NO | | NULL |
| hire_date | date | NO | | NULL |
| dob | date | YES | | NULL |
| gender | enum('F','M') | YES | | NULL |
+-----+-----+-----+-----+-----+
7 rows in set (0.016 sec)
```

Representative table:

```
CREATE TABLE representative(rep_id int(20) NOT NULL,
supervisor_id int(20), emp_id int(20) NOT NULL,
PRIMARY KEY(rep_id),
FOREIGN KEY (emp_id) REFERENCES employee (emp_id),
FOREIGN KEY (supervisor_id) REFERENCES representative (rep_id));
```

```
MariaDB [myhomes]> CREATE TABLE representative(rep_id int(20) NOT NULL,
-> supervisor_id int(20),
-> emp_id int(20) NOT NULL,
-> PRIMARY KEY(rep_id),
-> FOREIGN KEY (emp_id) REFERENCES employee (emp_id),
-> FOREIGN KEY (supervisor_id) REFERENCES representative (rep_id));
Query OK, 0 rows affected (0.016 sec)

MariaDB [myhomes]> desc representative;
+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+
| rep_id | int(20) | NO | PRI | NULL |
| supervisor_id | int(20) | YES | MUL | NULL |
| emp_id | int(20) | NO | MUL | NULL |
+-----+-----+-----+-----+-----+
3 rows in set (0.016 sec)
```

Customer table:

```
CREATE TABLE customer(customer_id int(20) NOT NULL,
rep_id int(20) NOT NULL, first_name varchar(45) NOT NULL,
last_name varchar(45) NOT NULL, email varchar(45) NOT NULL,
PRIMARY KEY(customer_id), FOREIGN KEY (rep_id) REFERENCES representative(rep_id));
```

```
MariaDB [myhomes]> CREATE TABLE customer(customer_id int(20) NOT NULL,
-> rep_id int(20) NOT NULL,
-> first_name varchar(45) NOT NULL,
-> last_name varchar(45) NOT NULL,
-> email varchar(45) NOT NULL,
-> PRIMARY KEY(customer_id),
-> FOREIGN KEY (rep_id) REFERENCES representative(rep_id));
Query OK, 0 rows affected (0.023 sec)

MariaDB [myhomes]> desc customer;
+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+
| customer_id | int(20) | NO | PRI | NULL |
| rep_id | int(20) | NO | MUL | NULL |
| first_name | varchar(45) | NO | | NULL |
| last_name | varchar(45) | NO | | NULL |
| email | varchar(45) | NO | | NULL |
+-----+-----+-----+-----+-----+
5 rows in set (0.016 sec)
```

Status table:

```
CREATE TABLE status(status_id int(1) NOT NULL,
status_desc varchar(20) NOT NULL, PRIMARY KEY (status_id));
```

```
MariaDB [myhomes]> CREATE TABLE status(status_id int(1) NOT NULL,
-> status_desc varchar(20) NOT NULL,
-> PRIMARY KEY (status_id));
Query OK, 0 rows affected (0.026 sec)

MariaDB [myhomes]> desc status;
+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+
| status_id | int(1) | NO | PRI | NULL |
| status_desc | varchar(20) | NO | | NULL |
+-----+-----+-----+-----+
2 rows in set (0.015 sec)
```

Type table:

```
CREATE TABLE type(type_id int(1) NOT NULL, type_desc varchar(20) NOT NULL,
PRIMARY KEY (type_id));
```

```
MariaDB [myhomes]> CREATE TABLE type(type_id int(1) NOT NULL,
-> type_desc varchar(20) NOT NULL,
-> PRIMARY KEY (type_id));
Query OK, 0 rows affected (0.025 sec)

MariaDB [myhomes]> desc type;
+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+
| type_id | int(1) | NO | PRI | NULL |
| type_desc | varchar(20) | NO | | NULL |
+-----+-----+-----+-----+
2 rows in set (0.005 sec)
```

Postcode table:

```
CREATE TABLE postcode(pcode varchar(10) NOT NULL, city varchar(20) NOT NULL, country
varchar(45) NOT NULL, street varchar(45) NOT NULL,
PRIMARY KEY (pcode));
```

```
MariaDB [myhomes]> CREATE TABLE postcode(pcode varchar(10) NOT NULL,
-> city varchar(20) NOT NULL,
-> country varchar(45) NOT NULL,
-> street varchar(45) NOT NULL,
-> PRIMARY KEY (pcode));
Query OK, 0 rows affected (0.025 sec)

MariaDB [myhomes]> desc postcode;
+-----+-----+-----+-----+
| Field | Type  | Null | Key | Default | Extra |
+-----+-----+-----+-----+
| pcode | varchar(10) | NO  | PRI | NULL   |       |
| city  | varchar(20)  | NO  |     | NULL   |       |
| country | varchar(45) | NO  |     | NULL   |       |
| street | varchar(45) | NO  |     | NULL   |       |
+-----+-----+-----+-----+
4 rows in set (0.016 sec)
```

Sales_area table:

```
CREATE TABLE sales_area(area_id int(20) NOT NULL,
area_name varchar(45) NOT NULL,
PRIMARY KEY (area_id));
```

```
MariaDB [myhomes]> CREATE TABLE sales_area(area_id int(20) NOT NULL,
-> area_name varchar(45) NOT NULL,
-> PRIMARY KEY (area_id));
Query OK, 0 rows affected (0.027 sec)

MariaDB [myhomes]> desc sales_area;
+-----+-----+-----+-----+
| Field | Type  | Null | Key | Default | Extra |
+-----+-----+-----+-----+
| area_id | int(20) | NO  | PRI | NULL   |       |
| area_name | varchar(45) | NO  |     | NULL   |       |
+-----+-----+-----+-----+
2 rows in set (0.015 sec)
```

Chief_salesperson table:

```
CREATE TABLE chief_salesperson(chief_id int NOT NULL,
emp_id int(20) NOT NULL, PRIMARY KEY (chief_id),
FOREIGN KEY (emp_id) REFERENCES employee(emp_id));
```

```
MariaDB [myhomes]> CREATE TABLE chief_salesperson(chief_id int NOT NULL,
-> emp_id int(20) NOT NULL,
-> PRIMARY KEY (chief_id),
-> FOREIGN KEY (emp_id) REFERENCES employee(emp_id));
Query OK, 0 rows affected (0.015 sec)

MariaDB [myhomes]> desc chief_salesperson;
+-----+-----+-----+-----+
| Field | Type  | Null | Key | Default | Extra |
+-----+-----+-----+-----+
| chief_id | int(11) | NO  | PRI | NULL   |       |
| emp_id  | int(20)  | NO  | MUL | NULL   |       |
+-----+-----+-----+-----+
2 rows in set (0.016 sec)
```

Address table:

```
CREATE TABLE address(address_id int(30) NOT NULL,
area_id int(20) NOT NULL, pcode varchar(10) NOT NULL,
door_no varchar(4) NOT NULL, PRIMARY KEY (address_id),
FOREIGN KEY (area_id) REFERENCES sales_area (area_id),
FOREIGN KEY (pcode) REFERENCES postcode (pcode));
```

```
MariaDB [myhomes]> CREATE TABLE address(address_id int(30) NOT NULL,
-> area_id int(20) NOT NULL,
-> pcode varchar(10) NOT NULL,
-> door_no varchar(4) NOT NULL,
-> PRIMARY KEY (address_id),
-> FOREIGN KEY (area_id) REFERENCES sales_area (area_id),
-> FOREIGN KEY (pcode) REFERENCES postcode (pcode));
Query OK, 0 rows affected (0.024 sec)

MariaDB [myhomes]> desc address;
+-----+-----+-----+-----+-----+
| Field      | Type       | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+
| address_id | int(30)    | NO   | PRI | NULL    |       |
| area_id    | int(20)    | NO   | MUL | NULL    |       |
| pcode       | varchar(10) | NO   | MUL | NULL    |       |
| door_no    | varchar(4) | NO   |      | NULL    |       |
+-----+-----+-----+-----+-----+
4 rows in set (0.016 sec)
```

Property table:

```
CREATE TABLE property(property_id int NOT NULL, status_id int(1) NOT NULL,
buyer_id int(20), seller_id int(20) NOT NULL, rep_id int(20) NOT NULL,
type_id int(1) NOT NULL, address_id int(30) NOT NULL,
num_bedrooms int(2) NOT NULL, num_bathrooms int(2) NOT NULL,
built_year date, health_safety ENUM('Y', 'N') NOT NULL,
garage ENUM('Y', 'N') NOT NULL, garden ENUM('Y', 'N') NOT NULL,
available_from date NOT NULL, sold_date date, size float NOT NULL,
PRIMARY KEY (property_id), FOREIGN KEY (status_id) REFERENCES status(status_id),
FOREIGN KEY (buyer_id) REFERENCES customer(customer_id),
FOREIGN KEY (seller_id) REFERENCES customer(customer_id),
FOREIGN KEY (rep_id) REFERENCES representative(rep_id),
FOREIGN KEY (type_id) REFERENCES type(type_id),
FOREIGN KEY (address_id) REFERENCES address(address_id));
```

```
MariaDB [myhomes]> CREATE TABLE property(property_id int NOT NULL, status_id int(1) NOT NULL,
buyer_id int(20), seller_id int(20) NOT NULL, rep_id int(20) NOT NULL,
-> type_id int(1) NOT NULL, address_id int(30) NOT NULL,
-> num_bedrooms int(2) NOT NULL, num_bathrooms int(2) NOT NULL,
-> built_year date, health_safety ENUM('Y', 'N') NOT NULL,
-> garage ENUM('Y', 'N') NOT NULL, garden ENUM('Y', 'N') NOT NULL,
-> available_from date NOT NULL, sold_date date,
-> size float NOT NULL, PRIMARY KEY (property_id),
-> FOREIGN KEY (status_id) REFERENCES status(status_id),
-> FOREIGN KEY (buyer_id) REFERENCES customer(customer_id),
-> FOREIGN KEY (seller_id) REFERENCES customer(customer_id),
-> FOREIGN KEY (rep_id) REFERENCES representative(rep_id),
-> FOREIGN KEY (type_id) REFERENCES type(type_id),
-> FOREIGN KEY (address_id) REFERENCES address(address_id));
Query OK, 0 rows affected (0.042 sec)
```

```
MariaDB [myhomes]> desc property;
+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+
| property_id | int(11) | NO | PRI | NULL |
| status_id | int(1) | NO | MUL | NULL |
| buyer_id | int(20) | YES | MUL | NULL |
| seller_id | int(20) | NO | MUL | NULL |
| rep_id | int(20) | NO | MUL | NULL |
| type_id | int(1) | NO | MUL | NULL |
| address_id | int(30) | NO | MUL | NULL |
| num_bedrooms | int(2) | NO | NULL |
| num_bathrooms | int(2) | NO | NULL |
| built_year | date | YES | NULL |
| health_safety | enum('Y','N') | NO | NULL |
| garage | enum('Y','N') | NO | NULL |
| garden | enum('Y','N') | NO | NULL |
| available_from | date | NO | NULL |
| sold_date | date | YES | NULL |
| size | float | NO | NULL |
+-----+-----+-----+-----+-----+
16 rows in set (0.014 sec)
```

Area_rep Table:

```
CREATE TABLE area_rep(rep_id int(20) NOT NULL,
chief_id int(11) NOT NULL, area_id int(20) NOT NULL,
FOREIGN KEY (rep_id) REFERENCES representative(rep_id),
FOREIGN KEY (chief_id) REFERENCES chief_salesperson(chief_id),
FOREIGN KEY (area_id) REFERENCES sales_area(area_id));
```

```
MariaDB [myhomes]> CREATE TABLE area_rep(rep_id int(20) NOT NULL,
-> chief_id int(11) NOT NULL,
-> area_id int(20) NOT NULL,
-> FOREIGN KEY (rep_id) REFERENCES representative(rep_id),
-> FOREIGN KEY (chief_id) REFERENCES chief_salesperson(chief_id),
-> FOREIGN KEY (area_id) REFERENCES sales_area(area_id));
Query OK, 0 rows affected (0.012 sec)

MariaDB [myhomes]> desc area_rep;
+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+
| rep_id | int(20) | NO | MUL | NULL |
| chief_id | int(11) | NO | MUL | NULL |
| area_id | int(20) | NO | MUL | NULL |
+-----+-----+-----+-----+
3 rows in set (0.016 sec)
```

Sales_target table:

```
CREATE TABLE sales_target(target_id int NOT NULL,
num_of_agreed int,num_of_sold int,chief_id int(11) NOT NULL, PRIMARY KEY (target_id),
FOREIGN KEY (chief_id) REFERENCES chief_salesperson(chief_id));
```

```
MariaDB [myhomes]> CREATE TABLE sales_target(target_id int NOT NULL,
-> num_of_agreed int,
-> num_of_sold int,
-> chief_id int(11) NOT NULL,
-> PRIMARY KEY (target_id),
-> FOREIGN KEY (chief_id) REFERENCES chief_salesperson(chief_id));
Query OK, 0 rows affected (0.024 sec)

MariaDB [myhomes]> desc sales_target;
+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+
| target_id | int(11) | NO | PRI | NULL |
| num_of_agreed | int(11) | YES | | NULL |
| num_of_sold | int(11) | YES | | NULL |
| chief_id | int(11) | NO | MUL | NULL |
+-----+-----+-----+-----+
4 rows in set (0.014 sec)
```

```
MariaDB [myhomes]> show tables;
+-----+
| Tables_in_myhomes |
+-----+
| address
| area_rep
| chief_salesperson
| customer
| employee
| postcode
| property
| representative
| sales_area
| sales_target
| status
| type
+-----+
12 rows in set (0.001 sec)
```

Part 2

A) Populating tables with some data

Employee:

```
INSERT INTO employee(emp_id, first_name, last_name, email, hire_date, dob, gender)
VALUES(1,'Esra','Aynali','eaynali@myhomes.com','2022-01-17','1992-04-23','F'),
(2,'John','Green','jgreen@myhomes.com','2000-05-14','1988-07-23','M'),
(3,'Alex','Turner','aturner@myhomes.com','2008-01-27','1990-06-05','M'),
(4,'Eva','Doe','edoe@myhomes.com','2021-04-23','1984.03.04','F'),
(5,'Kemal','Araz','karaz@myhomes.com','2021-07-05','1991-05-29','M'),
(6,'Bill','Joe','bjoe@myhomes.com','1999-06-05','1968-01-08','M'),
(7,'Susan','Doyle','sdoyle@myhomes.com','2000-04-06','1970-03-06','F'),
(8,'Bezalel','Simmel','bsimmel@myhomes.com','1985-11-21','1964-06-02','F'),
(9,'Georgi','Facello','gfacello@myhomes.com','1986-06-26','1953-09-02','M'),
(10,'Parto','Bamford','pbamford@myhomes.com','2002-05-01','1986-12-01','M'),
(11,'Chirstian','Koblick','ckoblick@myhomes.com','2017-05-12','1989-04-25','M'),
(12,'Anneke','Preu','apreu@myhomes.com','1989-06-02','1953-04-20','F'),
(13,'Freddy','Jason','fjason@myhomes.com','2015-05-04','1982-09-14','M'),
(14,'Sue','Reeves','sreeves@myhomes.com','2022-02-10','1981-05-26','F'),
(15,'Jenny','Dion','jdion@myhomes.com','2011-05-06','1958-01-02','F');
```

```
MariaDB [myhomes]> INSERT INTO employee(emp_id, first_name, last_name, email, hire_date, dob, gender)
-> VALUES(1,'Esra','Aynali','eaynali@myhomes.com','2022-01-17','1992-04-23','F'),
-> (2,'John','Green','jgreen@myhomes.com','2000-05-14','1988-07-23','M'),
-> (3,'Alex','Turner','aturner@myhomes.com','2008-01-27','1990-06-05','M'),
-> (4,'Eva','Doe','edoe@myhomes.com','2021-04-23','1984.03.04','F'),
-> (5,'Kemal','Araz','karaz@myhomes.com','2021-07-05','1991-05-29','M'),
-> (6,'Bill','Joe','bjoe@myhomes.com','1999-06-05','1968-01-08','M'),
-> (7,'Susan','Doyle','sdoyle@myhomes.com','2000-04-06','1970-03-06','F'),
-> (8,'Bezalel','Simmel','bsimmel@myhomes.com','1985-11-21','1964-06-02','F'),
-> (9,'Georgi','Facello','gfacello@myhomes.com','1986-06-26','1953-09-02','M'),
-> (10,'Parto','Bamford','pbamford@myhomes.com','2002-05-01','1986-12-01','M'),
-> (11,'Chirstian','Koblick','ckoblick@myhomes.com','2017-05-12','1989-04-25','M'),
-> (12,'Anneke','Preu','apreu@myhomes.com','1989-06-02','1953-04-20','F'),
-> (13,'Freddy','Jason','fjason@myhomes.com','2015-05-04','1982-09-14','M'),
-> (14,'Sue','Reeves','sreeves@myhomes.com','2022-02-10','1981-05-26','F'),
-> (15,'Jenny','Dion','jdion@myhomes.com','2011-05-06','1958-01-02','F');

Query OK, 15 rows affected (0.018 sec)
Records: 15  Duplicates: 0  Warnings: 0
```

```
MariaDB [myhomes]> select * from employee;
+-----+-----+-----+-----+-----+-----+-----+
| emp_id | first_name | last_name | email | hire_date | dob | gender |
+-----+-----+-----+-----+-----+-----+-----+
| 1 | Esra | Aynali | eaynali@myhomes.com | 2022-01-17 | 1992-04-23 | F |
| 2 | John | Green | jgreen@myhomes.com | 2000-05-14 | 1988-07-23 | M |
| 3 | Alex | Turner | aturner@myhomes.com | 2008-01-27 | 1990-06-05 | M |
| 4 | Eva | Doe | edoe@myhomes.com | 2021-04-23 | 1984-03-04 | F |
| 5 | Kemal | Araz | karaz@myhomes.com | 2021-07-05 | 1991-05-29 | M |
| 6 | Bill | Joe | bjoe@myhomes.com | 1999-06-05 | 1968-01-08 | M |
| 7 | Susan | Doyle | sdoyle@myhomes.com | 2000-04-06 | 1970-03-06 | F |
| 8 | Bezalel | Simmel | bsimmel@myhomes.com | 1985-11-21 | 1964-06-02 | F |
| 9 | Georgi | Facello | gfacello@myhomes.com | 1986-06-26 | 1953-09-02 | M |
| 10 | Parto | Bamford | pbamford@myhomes.com | 2002-05-01 | 1986-12-01 | M |
| 11 | Chirstian | Koblick | ckoblick@myhomes.com | 2017-05-12 | 1989-04-25 | M |
| 12 | Anneke | Preu | apreu@myhomes.com | 1989-06-02 | 1953-04-20 | F |
| 13 | Freddy | Jason | fjason@myhomes.com | 2015-05-04 | 1982-09-14 | M |
| 14 | Sue | Reeves | sreeves@myhomes.com | 2022-02-10 | 1981-05-26 | F |
| 15 | Jenny | Dion | jdion@myhomes.com | 2011-05-06 | 1958-01-02 | F |
+-----+-----+-----+-----+-----+-----+
15 rows in set (0.001 sec)
```

Representative:

```
INSERT INTO representative(rep_id,supervisor_id,emp_id)
VALUES(1,NULL,1), (3,NULL,2),(4,NULL,3), (5,NULL,4),
(6,NULL,8), (7,NULL,12), (8,NULL,9), (9,NULL,7),(10,NULL,6), (11,NULL,5);
```

```
lvc \rep_id ''
MariaDB [myhomes]> INSERT INTO representative(rep_id,supervisor_id,emp_id)
-> VALUES(1,NULL,1),
-> (3,NULL,2),
-> (4,NULL,3),
-> (5,NULL,4),
-> (6,NULL,8),
-> (7,NULL,12),
-> (8,NULL,9),
-> (9,NULL,7),
-> (10,NULL,6),
-> (11,NULL,5);
Query OK, 10 rows affected (0.019 sec)
Records: 10  Duplicates: 0  Warnings: 0

MariaDB [myhomes]> select * from representative
-> ;
+-----+-----+-----+
| rep_id | supervisor_id | emp_id |
+-----+-----+-----+
| 1      |      NULL    | 1      |
| 3      |      NULL    | 2      |
| 4      |      NULL    | 3      |
| 5      |      NULL    | 4      |
| 6      |      NULL    | 8      |
| 7      |      NULL    | 12     |
| 8      |      NULL    | 9      |
| 9      |      NULL    | 7      |
| 10     |      NULL    | 6      |
| 11     |      NULL    | 5      |
+-----+-----+-----+
10 rows in set (0.001 sec)
```

```
# representatives : 1,2,3,4,5,6,7,8,9,12,10 - supervisors 6,7,8,9,12
UPDATE representative SET supervisor_id = 6 WHERE rep_id = 1;
UPDATE representative SET supervisor_id = 7 WHERE rep_id = 3;
UPDATE representative SET supervisor_id = 8 WHERE rep_id = 4;
UPDATE representative SET supervisor_id = 9 WHERE rep_id = 5;
UPDATE representative SET supervisor_id = 10 WHERE rep_id = 11;
```

```
MariaDB [myhomes]> INSERT INTO representative(rep_id,supervisor_id,emp_id)
-> VALUES(2,8,10);
Query OK, 1 row affected (0.003 sec)

MariaDB [myhomes]> select * from representative;
+-----+-----+-----+
| rep_id | supervisor_id | emp_id |
+-----+-----+-----+
| 1      |      6        | 1      |
| 2      |      8        | 10     |
| 3      |      7        | 2      |
| 4      |      8        | 3      |
| 5      |      9        | 4      |
| 6      |      NULL     | 8      |
| 7      |      NULL     | 12     |
| 8      |      NULL     | 9      |
| 9      |      NULL     | 7      |
| 10     |      NULL     | 6      |
| 11     |      10       | 5      |
+-----+-----+-----+
11 rows in set (0.000 sec)
```

Type:

```
INSERT INTO type(type_id, type_desc)
VALUES(1,'house'),
(2,'flat/apartment'),
(3,'bungallow'),
(4,'land'),
(5,'commercial property');
```

```
MariaDB [myhomes]> INSERT INTO type(type_id, type_desc)
-> VALUES(1,'house'),
-> (2,'flat/apartment'),
-> (3,'bungallow'),
-> (4,'land'),
-> (5,'commercial property');
Query OK, 5 rows affected (0.016 sec)
Records: 5  Duplicates: 0  Warnings: 0

MariaDB [myhomes]> select * from type;
+-----+-----+
| type_id | type_desc      |
+-----+-----+
|      1 | house          |
|      2 | flat/apartment |
|      3 | bungallow       |
|      4 | land            |
|      5 | commercial prop |
+-----+-----+
5 rows in set (0.001 sec)
```

Status:

```
INSERT INTO status(status_id, status_desc)
VALUES(1,'For Sale'),
(2,'Sale Agreed'),
(3,'Sold');
```

```
MariaDB [myhomes]> INSERT INTO status(status_id, status_desc)
-> VALUES(1,'For Sale'),
-> (2,'Sale Agreed'),
-> (3,'Sold');
Query OK, 3 rows affected (0.014 sec)
Records: 3  Duplicates: 0  Warnings: 0

MariaDB [myhomes]> select * from status;
+-----+-----+
| status_id | status_desc   |
+-----+-----+
|      1 | For Sale     |
|      2 | Sale Agreed |
|      3 | Sold          |
+-----+-----+
3 rows in set (0.001 sec)
```

Customer:

```
INSERT INTO customer(customer_id,rep_id,first_name,last_name,email)
VALUES(1,1,'Alex','Blee','alexb@gmail.com'), (2,3,'David','Bold','david@hotmail.com'),
(3,2,'Felix','Gun','fgun@gmail.com'), (4,1,'Simon','Harg','simon@yahoo.com'),
(5,3,'Elieen','Murray','elieenm@gmail.com'),(6,2,'Andrea','Cult','andrea.cult@gmail.com'),
(7,4,'Brendon','Flow','brendonf@gmail.com),(8,4,'Sean','Connor','sconner@gmail.com'),
(9,6,'Sam','Butler','samb@gmail.com'),(10,5,'Lola','Snow','lola@yahoo.com'),
(11,6,'Kate','Viny','kateviny@gmail.com'),(12,5,'Matt','Helders','mhelders@gmail.com'),
(13,7,'Jamie','Cook','jcook@gmail.com'),(14,9,'Natalie','Iris','nataliris@gmail.com'),
(15,8,'Nick','Suv','nicko@yahoo.com'),(16,8,'Alexa','Simon','alexasimon@gmail.com'),
(17,7,'Hazel','March','hmarch@gmail.com'),(18,9,'Tom','Anderson','tomanderson@gmail.com'),
(19,12,'Andy','Philip','andyo@hotmail.com'),(20,12,'Bob','Bean','beanbob@gmail.com');
```

```
MariaDB [myhomes]> INSERT INTO customer(customer_id,rep_id,first_name,last_name,email)
-> VALUES
-> (1,1,'Alex','Blee','alexb@gmail.com'),
-> (2,3,'David','Bold','david@hotmail.com'),
-> (3,2,'Felix','Gun','fgun@gmail.com'),
-> (4,1,'Simon','Harg','simon@yahoo.com'),
-> (5,3,'Elieen','Murray','elieenm@gmail.com'),
-> (6,2,'Andrea','Cult','andrea.cult@gmail.com'),
-> (7,4,'Brendon','Flow','brendonf@gmail.com'),
-> (8,4,'Sean','Connor','sconner@gmail.com'),
-> (9,6,'Sam','Butler','samb@gmail.com'),
-> (10,5,'Lola','Snow','lola@yahoo.com'),
-> (11,6,'Kate','Viny','kateviny@gmail.com'),
-> (12,5,'Matt','Helders','mhelders@gmail.com'),
-> (13,7,'Jamie','Cook','jcook@gmail.com'),
-> (14,9,'Natalie','Iris','nataliris@gmail.com'),
-> (15,8,'Nick','Suv','nicko@yahoo.com'),
-> (16,8,'Alexa','Simon','alexasimon@gmail.com'),
-> (17,7,'Hazel','March','hmarch@gmail.com'),
-> (18,9,'Tom','Anderson','tomanderson@gmail.com'),
-> (19,11,'Andy','Philip','andyo@hotmail.com'),
-> (20,11,'Bob','Bean','beanbob@gmail.com');
Query OK, 20 rows affected (0.015 sec)
Records: 20  Duplicates: 0  Warnings: 0
```

```
MariaDB [myhomes]> select * from customer;
+-----+-----+-----+-----+
| customer_id | rep_id | first_name | last_name | email
+-----+-----+-----+-----+
| 1 | 1 | Alex | Blee | alexb@gmail.com |
| 2 | 3 | David | Bold | david@hotmail.com |
| 3 | 2 | Felix | Gun | fgun@gmail.com |
| 4 | 1 | Simon | Harg | simon@yahoo.com |
| 5 | 3 | Elieen | Murray | elieenm@gmail.com |
| 6 | 2 | Andrea | Cult | andrea.cult@gmail.com |
| 7 | 4 | Brendon | Flow | brendonf@gmail.com |
| 8 | 4 | Sean | Connor | sconner@gmail.com |
| 9 | 6 | Sam | Butler | samb@gmail.com |
| 10 | 5 | Lola | Snow | lola@yahoo.com |
| 11 | 6 | Kate | Viny | kateviny@gmail.com |
| 12 | 5 | Matt | Helders | mhleders@gmail.com |
| 13 | 7 | Jamie | Cook | jcook@gmail.com |
| 14 | 9 | Natalie | Iris | nataliris@gmail.com |
| 15 | 8 | Nick | Suv | nicko@yahoo.com |
| 16 | 8 | Alexa | Simon | alexasimon@gmail.com |
| 17 | 7 | Hazel | March | hmarch@gmail.com |
| 18 | 9 | Tom | Anderson | tomanderson@gmail.com |
| 19 | 11 | Andy | Philip | andyo@hotmail.com |
| 20 | 11 | Bob | Bean | beanbob@gmail.com |
+-----+-----+-----+-----+
20 rows in set (0.001 sec)
```

Postcode:

```
INSERT INTO postcode(pcode,city,country,street)
VALUES('D04P8X4','Dublin','Ireland','Herbert Cottages'),
('D01KD63','Dublin','Ireland','Upper Dorset Street'),
('35530','Izmir','Turkey','2040'), ('D09P3T4','Dublin','Ireland','Iona Drive'),
('34460','Istanbul','Turkey','Kevser'), ('T12YFV0','Cork','Ireland','Princes Street'),
('T12T2X2','Cork','Ireland','Hillside Grove'), ('V94D7YD','Limerick','Ireland','Oakland Drive'),
('06589','Ankara','Turkey','Birlik'), ('WC2R0NT','London','UK','Strand'),
('W1T3NF','London','UK','Barners Street'), ('1012','Amsterdam','Netherlands','Noord-Holland'),
('00118','Rome','Italy','Acquaformosa'), ('H91TFY2','Galway','Ireland','Tuam Road');
```

```
MariaDB [myhomes]> INSERT INTO postcode(pcode,city,country,street)
-> VALUES
-> ('D04P8X4','Dublin','Ireland','Herbert Cottages'),
-> ('D01KD63','Dublin','Ireland','Upper Dorset Street'),
-> ('35530','Izmir','Turkey','2040'),
-> ('D09P3T4','Dublin','Ireland','Iona Drive'),
-> ('34460','Istanbul','Turkey','Kevser'),
-> ('T12YFV0','Cork','Ireland','Princes Street'),
-> ('T12T2X2','Cork','Ireland','Hillside Grove'),
-> ('V94D7YD','Limerick','Ireland','Oakland Drive'),
-> ('06589','Ankara','Turkey','Birlik'),
-> ('WC2R0NT','London','UK','Strand'),
-> ('W1T3NF','London','UK','Barners Street'),
-> ('1012','Amsterdam','Netherlands','Noord-Holland'),
-> ('00118','Rome','Italy','Acquaformosa'),
-> ('H91TFY2','Galway','Ireland','Tuam Road');
Query OK, 14 rows affected (0.019 sec)
Records: 14  Duplicates: 0  Warnings: 0

MariaDB [myhomes]> select * from postcode;
+-----+-----+-----+-----+
| pcode | city  | country | street |
+-----+-----+-----+-----+
| 00118 | Rome   | Italy   | Acquaformosa
| 06589 | Ankara | Turkey  | Birlik
| 1012  | Amsterdam | Netherlands | Noord-Holland
| 34460 | Istanbul | Turkey  | Kevser
| 35530 | Izmir   | Turkey  | 2040
| D01KD63 | Dublin  | Ireland | Upper Dorset Street
| D04P8X4 | Dublin  | Ireland | Herbert Cottages
| D09P3T4 | Dublin  | Ireland | Iona Drive
| H91TFY2 | Galway  | Ireland | Tuam Road
| T12T2X2 | Cork    | Ireland | Hillside Grove
| T12YFV0 | Cork    | Ireland | Princes Street
| V94D7YD | Limerick | Ireland | Oakland Drive
| W1T3NF  | London  | UK      | Barners Street
| WC2R0NT | London  | UK      | Strand
+-----+-----+-----+-----+
14 rows in set (0.001 sec)
```

Sales_area:

```
INSERT INTO sales_area(area_id,area_name)
VALUES(1,'D04'),(2,'D01'),(3,'Karsiyaka'),(4,'D09'),(5,'Sisli'),
(6,'T12'),(7,'Greystones'),(8,'Gaziosmanpasa'),(9,'Westminster'),
(10,'Covent'),(11,'De Wallen'),(12,'Casal Morena'),(13,'Ballybane');
```

```
MariaDB [myhomes]> INSERT INTO sales_area(area_id,area_name)
-> VALUES(1,'D04'),(2,'D01'),(3,'Karsiyaka'),(4,'D09'),(5,'Sisli'),
-> (6,'T12'),(7,'Greystones'),(8,'Gaziosmanpasa'),(9,'Westminster'),
-> (10,'Covent'),(11,'De Wallen'),(12,'Casal Morena'),(13,'Ballybane');
Query OK, 13 rows affected (0.013 sec)
Records: 13  Duplicates: 0  Warnings: 0

MariaDB [myhomes]> select * from sales_area;
+-----+-----+
| area_id | area_name |
+-----+-----+
|      1 | D04      |
|      2 | D01      |
|      3 | Karsiyaka |
|      4 | D09      |
|      5 | Sisli     |
|      6 | T12      |
|      7 | Greystones |
|      8 | Gaziosmanpasa |
|      9 | Westminster |
|     10 | Covent    |
|     11 | De Wallen   |
|     12 | Casal Morena |
|     13 | Ballybane   |
+-----+-----+
13 rows in set (0.001 sec)
```

Chief_salesperson:

```
# supervisor=6,7,8,9,12 - chief = 6,7,9,12)
INSERT INTO chief_salesperson(chief_id,emp_id)
VALUES(1,6),(2,7),(3,9),(4,12);
```

```
MariaDB [myhomes]> INSERT INTO chief_salesperson(chief_id,emp_id)
-> VALUES
-> (1,6),
-> (2,7),
-> (3,9),
-> (4,12);
Query OK, 4 rows affected (0.014 sec)
Records: 4  Duplicates: 0  Warnings: 0

MariaDB [myhomes]> select * from chief_salesperson;
+-----+-----+
| chief_id | emp_id |
+-----+-----+
|      1 |      6 |
|      2 |      7 |
|      3 |      9 |
|      4 |     12 |
+-----+-----+
4 rows in set (0.001 sec)
```

Area_rep:

```
INSERT INTO area_rep(rep_id,chief_id,area_id)
VALUES(1,1,1),(1,1,2),(5,3,3),(1,4,4),(2,2,5),(3,2,6),(4,4,7),(5,4,8),(11,3,9),
(11,3,10),(6,2,11),(6,2,12),(2,4,13);
```

```
MariaDB [myhomes]> INSERT INTO area_rep(rep_id,chief_id,area_id)
-> VALUES
-> (1,1,1),
-> (1,1,2),
-> (5,3,3),
-> (1,4,4),
-> (2,2,5),
-> (3,2,6),
-> (4,4,7),
-> (5,4,8),
-> (11,3,9),
-> (11,3,10),
-> (6,2,11),
-> (6,2,12),
-> (2,4,13);
Query OK, 13 rows affected (0.020 sec)
Records: 13  Duplicates: 0  Warnings: 0

MariaDB [myhomes]> select * from area_rep;
+-----+-----+-----+
| rep_id | chief_id | area_id |
+-----+-----+-----+
|      1 |        1 |       1 |
|      1 |        1 |       2 |
|      5 |        3 |       3 |
|      1 |        4 |       4 |
|      2 |        2 |       5 |
|      3 |        2 |       6 |
|      4 |        4 |       7 |
|      5 |        4 |       8 |
|     11 |        3 |       9 |
|    11 |        3 |      10 |
|      6 |        2 |      11 |
|      6 |        2 |      12 |
|      2 |        4 |      13 |
+-----+-----+-----+
13 rows in set (0.001 sec)
```

Sales_target:

```
INSERT INTO sales_target(target_id,num_of_agreed,num_of_sold,chief_id)
VALUES(1,5,3,1),(2,12,10,2),(3,7,7,3),(4,8,10,3),(5,7,5,4),
(6,NULL,NULL,2),(7,15,10,1),(8,1,0,3),(9,8,6,2),(10,NULL,NULL,4);
```

```
MariaDB [myhomes]> INSERT INTO sales_target(target_id,num_of_agreed,num_of_sold,chief_id)
-> VALUES(1,5,3,1),(2,12,10,2),(3,7,7,3),(4,8,10,3),(5,7,5,4),
-> (6,NULL,NULL,2),(7,15,10,1),(8,1,0,3),(9,8,6,2),(10,NULL,NULL,4);
Query OK, 10 rows affected (0.020 sec)
Records: 10  Duplicates: 0  Warnings: 0

MariaDB [myhomes]> select * from sales_target;
+-----+-----+-----+-----+
| target_id | num_of_agreed | num_of_sold | chief_id |
+-----+-----+-----+-----+
|      1 |         5 |         3 |        1 |
|      2 |        12 |        10 |        2 |
|      3 |         7 |         7 |        3 |
|      4 |         8 |        10 |        3 |
|      5 |         7 |         5 |        4 |
|      6 |        NULL |        NULL |        2 |
|      7 |        15 |        10 |        1 |
|      8 |         1 |          0 |        3 |
|      9 |         8 |         6 |        2 |
|     10 |        NULL |        NULL |        4 |
+-----+-----+-----+-----+
10 rows in set (0.001 sec)
```

Address:

```
INSERT INTO address(address_id,area_id,pcode,door_no)
VALUES(1,1,'D04P8X4','3'),
(2,1,'D04P8X4','4'), (3,3,'35530','36'),
(4,5,'34460','9'), (5,6,'T12T2X2','12'),
(6,6,'T12T2X2','35'),
(7,6,'T12YFV0','9B'),
(8,8,'06589','9'),
(9,2,'D01KD63','98'),
(10,2,'D01KD63','94'),
(11,4,'D09P3T4','9'),
(12,1,'D04P8X4','12'),
(13,10,'W1T3NF','221B'),
(14,7,'H91TFY2','102'),
(15,11,'1012','103'),
(16,12,'00118','0'),
(17,5,'34460','67'),
(18,13,'V94D7YD','87B'),
(19,3,'35530','0'),
(20,5,'T12YFV0','3');
```

```
MariaDB [myhomes]> select * from address;
+-----+-----+-----+-----+
| address_id | area_id | pcode | door_no |
+-----+-----+-----+-----+
| 1 | 1 | D04P8X4 | 3 |
| 2 | 1 | D04P8X4 | 4 |
| 3 | 3 | 35530 | 36 |
| 4 | 5 | 34460 | 9 |
| 5 | 6 | T12T2X2 | 12 |
| 6 | 6 | T12T2X2 | 35 |
| 7 | 6 | T12YFV0 | 9B |
| 8 | 8 | 06589 | 9 |
| 9 | 2 | D01KD63 | 98 |
| 10 | 2 | D01KD63 | 94 |
| 11 | 4 | D09P3T4 | 9 |
| 12 | 1 | D04P8X4 | 12 |
| 13 | 10 | W1T3NF | 221B |
| 14 | 7 | H91TFY2 | 102 |
| 15 | 11 | 1012 | 103 |
| 16 | 12 | 00118 | 0 |
| 17 | 5 | 34460 | 67 |
| 18 | 13 | V94D7YD | 87B |
| 19 | 3 | 35530 | 0 |
| 20 | 5 | T12YFV0 | 3 |
+-----+-----+-----+-----+
20 rows in set (0.001 sec)
```

Property:

```
MariaDB [myhomes]> ALTER TABLE property
    -> drop column available_from;
Query OK, 0 rows affected (0.010 sec)
Records: 0  Duplicates: 0  Warnings: 0

MariaDB [myhomes]> ALTER TABLE property
    -> drop column size;
Query OK, 0 rows affected (0.017 sec)
Records: 0  Duplicates: 0  Warnings: 0

MariaDB [myhomes]> desc property;
+-----+-----+-----+-----+-----+
| Field      | Type       | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+
| property_id | int(11)    | NO   | PRI | NULL    |       |
| status_id   | int(1)     | NO   | MUL | NULL    |       |
| buyer_id    | int(20)    | YES  | MUL | NULL    |       |
| seller_id   | int(20)    | NO   | MUL | NULL    |       |
| rep_id      | int(20)    | NO   | MUL | NULL    |       |
| type_id     | int(1)     | NO   | MUL | NULL    |       |
| address_id  | int(30)    | NO   | MUL | NULL    |       |
| num_bedrooms | int(2)    | NO   |       | NULL    |       |
| num_bathrooms | int(2)   | NO   |       | NULL    |       |
| built_year  | date       | YES  |       | NULL    |       |
| health_safety | enum('Y','N') | NO   |       | NULL    |       |
| garage      | enum('Y','N') | NO   |       | NULL    |       |
| garden       | enum('Y','N') | NO   |       | NULL    |       |
| sold_date   | date       | YES  |       | NULL    |       |
+-----+-----+-----+-----+-----+
14 rows in set (0.004 sec)
```

```
INSERT INTO property(property_id,status_id,buyer_id,seller_id,rep_id,type_id,
address_id,num_bedrooms,num_bathrooms,built_year,health_safety,garage,garden)
VALUES (1,1,NULL,4,1,1,11,2,1,'1874-01-06','N','Y','Y'),
(2,1,NULL,6,1,2,10,1,1,'1950-01-01','Y','N','N'), (3,1,NULL,7,2,1,17,3,2,'2021-03-25','Y','Y','N'),
(4,2,NULL,9,3,2,7,2,1,'2000-06-12','Y','N','N'),
(5,2,NULL,11,2,5,18,1,1,'2017-11-26','Y','N','N'),
(6,1,NULL,12,1,1,1,2,2,'2018-02-14','Y','Y','Y'),
(7,3,3,13,4,1,14,2,1,'1980-04-25','Y','N','Y'),
(8,3,8,14,5,2,3,1,1,'2000-02-08','Y','Y','N'),
(9,3,18,15,6,2,15,1,1,NULL,'Y','Y','N'),
(10,3,1,17,6,3,16,1,1,'2022-01-12','Y','N','Y'),
(11,3,16,19,3,5,6,1,1,NULL,'Y','N','N'),
(12,1,NULL,13,1,2,9,2,2,'1957-03-26','Y','N','N'),
(13,1,NULL,14,2,2,4,2,1,'1960-05-24','Y','N','N'),
(14,2,NULL,15,11,5,13,2,4,'2000-07-07','Y','N','N'),
(15,2,NULL,17,1,1,2,3,2,'2018-06-29','Y','Y','Y'),
(16,1,NULL,19,5,1,8,2,1,'2002-12-23','Y','Y','Y'),
(17,3,2,9,2,1,20,1,1,'1963-02-01','N','Y','N'),
(18,3,10,6,3,5,5,3,2,'1990-01-01','Y','N','N'),
(19,3,10,4,1,2,12,1,1,'1992-04-23','Y','Y','N'),
(20,3,5,11,5,4,19,0,0,'O','N','N','Y');
```

```
MariaDB [myhomes]> INSERT INTO property(property_id,status_id,buyer_id,seller_id,
-> rep_id,type_id,address_id,num_bedrooms,num_bathrooms,
-> built_year,health_safety,garage,garden)
-> VALUES
-> (1,1,NULL,4,1,1,11,2,1,'1874-01-06','N','Y','Y'),
-> (2,1,NULL,6,1,2,10,1,1,'1950-01-01','Y','N','N'),
-> (3,1,NULL,7,2,1,17,3,2,'2021-03-25','Y','Y','N'),
-> (4,2,NULL,9,3,2,7,2,1,'2000-06-12','Y','N','N'),
-> (5,2,NULL,11,2,5,18,1,1,'2017-11-26','Y','N','N'),
-> (6,1,NULL,12,1,1,2,2,'2018-02-14','Y','Y','Y'),
-> (7,3,3,13,4,1,14,2,1,'1980-04-25','Y','N','Y'),
-> (8,3,8,14,5,2,3,1,1,'2000-02-08','Y','Y','N'),
-> (9,3,18,15,6,2,15,1,1,NULL,'Y','Y','N'),
-> (10,3,1,17,6,3,16,1,1,'2022-01-12','Y','N','Y'),
-> (11,3,16,19,3,5,6,1,1,NULL,'Y','N','N'),
-> (12,1,NULL,13,1,2,9,2,2,'1957-03-26','Y','N','N'),
-> (13,1,NULL,14,2,2,4,2,1,'1960-05-24','Y','N','N'),
-> (14,2,NULL,15,11,5,13,2,4,'2000-07-07','Y','N','N'),
-> (15,2,NULL,17,1,1,2,3,2,'2018-06-29','Y','Y','Y'),
-> (16,1,NULL,19,5,1,8,2,1,'2002-12-23','Y','Y','Y'),
-> (17,3,2,9,2,1,20,1,1,'1963-02-01','N','Y','N'),
-> (18,3,10,6,3,5,5,3,2,'1990-01-01','Y','N','N'),
-> (19,3,10,4,1,2,12,1,1,'1992-04-23','Y','Y','N'),
-> (20,3,5,11,5,4,19,0,0,0,'N','N','Y');
Query OK, 20 rows affected, 1 warning (0.016 sec)
Records: 20 Duplicates: 0 Warnings: 1
```

MariaDB [myhomes]> select * from property;														
property_id	status_id	buyer_id	seller_id	rep_id	type_id	address_id	num_bedrooms	num_bathrooms	built_year	health_safety	garage	garden	sold_date	
1	1	NULL	4	1	1	11	2	1	1874-01-06	N	Y	Y	NULL	
2	1	NULL	6	1	2	10	1	1	1950-01-01	Y	N	N	NULL	
3	1	NULL	7	2	1	17	3	1	2021-03-25	Y	Y	N	NULL	
4	2	NULL	9	3	2	7	2	1	2000-06-12	Y	N	N	NULL	
5	2	NULL	11	2	5	18	1	1	2017-11-26	Y	N	N	NULL	
6	1	NULL	12	1	1	1	1	2	2018-02-14	Y	Y	Y	NULL	
7	3	3	13	4	1	14	2	1	1980-04-25	Y	N	Y	NULL	
8	3	8	14	5	2	3	1	1	2000-02-08	Y	Y	N	NULL	
9	3	18	15	6	2	15	1	1	NULL	Y	Y	N	NULL	
10	3	1	17	6	3	16	1	1	2022-01-12	Y	N	Y	NULL	
11	3	16	19	3	5	6	1	1	NULL	Y	N	N	NULL	
12	1	NULL	13	1	2	9	2	1	1957-03-26	Y	N	N	NULL	
13	1	NULL	14	2	2	4	2	1	1960-05-24	Y	N	N	NULL	
14	2	NULL	15	11	5	13	13	2	2000-07-07	Y	N	N	NULL	
15	2	NULL	17	1	1	2	3	1	2018-06-29	Y	Y	Y	NULL	
16	1	NULL	19	5	1	8	2	1	2002-12-23	Y	Y	Y	NULL	
17	3	2	9	2	1	20	1	1	1963-02-01	N	Y	N	NULL	
18	3	10	6	3	5	5	3	1	1990-01-01	Y	N	N	NULL	
19	3	10	4	1	2	12	1	1	1992-04-23	Y	Y	N	NULL	
20	3	5	11	5	4	19	0	0	0000-00-00	N	N	Y	NULL	

20 rows in set (0.001 sec)

sold_dates updated manually

MariaDB [myhomes]> select * from property;														
property_id	status_id	buyer_id	seller_id	rep_id	type_id	address_id	num_bedrooms	num_bathrooms	built_year	health_safety	garage	garden	sold_date	
1	3	18	15	6	2	15	1	1	NULL	Y	Y	N	2018-01-23	
2	3	16	19	3	5	6	1	1	NULL	Y	N	N	2001-05-29	
3	3	10	4	1	2	12	1	1	1992-04-23	Y	Y	N	2021-04-23	
4	3	10	6	3	5	5	3	2	1990-01-01	Y	N	N	2019-01-27	
5	3	8	14	5	2	3	1	1	2000-02-08	Y	Y	N	2022-02-01	
6	3	5	11	5	4	19	0	0	0000-00-00	N	N	Y	2022-01-05	
7	3	3	13	4	1	14	1	1	1980-04-25	Y	N	Y	2020-12-05	
8	3	2	9	2	1	20	1	1	1963-02-01	N	Y	N	2017-05-26	
9	3	1	17	6	3	16	1	1	2022-01-12	Y	N	Y	2022-02-05	

price column added

MariaDB [myhomes]> ALTER TABLE property														
> ADD price int(11) NOT NULL;														
Query OK, 0 rows affected (0.018 sec)														
Records: 0 Duplicates: 0 Warnings: 0														
MariaDB [myhomes]> desc property;														
Field	Type	Null	Key	Default	Extra									
property_id	int(11)	NO	PRI	NULL										
status_id	int(1)	NO	MUL	NULL										
buyer_id	int(20)	YES	MUL	NULL										
seller_id	int(20)	NO	MUL	NULL										
rep_id	int(20)	NO	MUL	NULL										
type_id	int(1)	NO	MUL	NULL										
address_id	int(30)	NO	MUL	NULL										
num_bedrooms	int(2)	NO		NULL										
num_bathrooms	int(2)	NO		NULL										
built_year	date	YES		NULL										
health_safety	enum('Y','N')	NO		NULL										
garage	enum('Y','N')	NO		NULL										
garden	enum('Y','N')	NO		NULL										
sold_date	date	YES		NULL										
price	int(11)	NO		NULL										

15 rows in set (0.015 sec)

price added manually

Property Management System - Home Listings																	
Search & Filter		Property Details															
<input type="button" value="New"/> <input type="button" value="Edit"/> <input type="button" value="Delete"/>		Property ID	Status	Buyer ID	Seller ID	Rep ID	Type ID	Address ID	Bedrooms	Bathrooms	Built Year	Health Safety	Garage	Garden	Sold Date	Price	
<input type="checkbox"/>	<input type="button" value="Edit"/> <input type="button" value="Copy"/> <input type="button" value="Delete"/>	1	Active	1	NULL	4	1	1	11	2	1	1874-01-06	N	Y	Y	NULL	765000
<input type="checkbox"/>	<input type="button" value="Edit"/> <input type="button" value="Copy"/> <input type="button" value="Delete"/>	2	Active	1	NULL	6	1	2	10	1	1	1950-01-01	Y	N	N	NULL	250000
<input type="checkbox"/>	<input type="button" value="Edit"/> <input type="button" value="Copy"/> <input type="button" value="Delete"/>	3	Active	1	NULL	7	2	1	17	3	2	2021-03-25	Y	Y	N	NULL	1000000
<input type="checkbox"/>	<input type="button" value="Edit"/> <input type="button" value="Copy"/> <input type="button" value="Delete"/>	4	Active	2	NULL	9	3	2	7	2	1	2000-06-12	Y	N	N	NULL	450750
<input type="checkbox"/>	<input type="button" value="Edit"/> <input type="button" value="Copy"/> <input type="button" value="Delete"/>	5	Active	2	NULL	11	2	5	18	1	1	2017-11-26	Y	N	N	NULL	800000
<input type="checkbox"/>	<input type="button" value="Edit"/> <input type="button" value="Copy"/> <input type="button" value="Delete"/>	6	Active	1	NULL	12	1	1	1	2	2	2018-02-14	Y	Y	Y	NULL	625000
<input type="checkbox"/>	<input type="button" value="Edit"/> <input type="button" value="Copy"/> <input type="button" value="Delete"/>	7	Active	3	3	13	4	1	14	2	1	1980-04-25	Y	N	Y	2020-12-01	475000
<input type="checkbox"/>	<input type="button" value="Edit"/> <input type="button" value="Copy"/> <input type="button" value="Delete"/>	8	Active	3	8	14	5	2	3	1	1	2000-02-08	Y	Y	N	2022-02-01	350000
<input type="checkbox"/>	<input type="button" value="Edit"/> <input type="button" value="Copy"/> <input type="button" value="Delete"/>	9	Active	3	18	15	6	2	15	1	1	NULL	Y	Y	N	2018-01-22	300000
<input type="checkbox"/>	<input type="button" value="Edit"/> <input type="button" value="Copy"/> <input type="button" value="Delete"/>	10	Active	1	1	17	6	3	16	1	1	2022-01-12	Y	N	Y	2022-02-01	345250
<input type="checkbox"/>	<input type="button" value="Edit"/> <input type="button" value="Copy"/> <input type="button" value="Delete"/>	11	Active	3	16	19	3	5	6	1	1	NULL	Y	N	N	2001-05-21	420000
<input type="checkbox"/>	<input type="button" value="Edit"/> <input type="button" value="Copy"/> <input type="button" value="Delete"/>	12	Active	1	NULL	13	1	2	9	2	2	1957-03-26	Y	N	N	NULL	425000
<input type="checkbox"/>	<input type="button" value="Edit"/> <input type="button" value="Copy"/> <input type="button" value="Delete"/>	13	Active	1	NULL	14	2	2	4	2	1	1960-05-24	Y	N	N	NULL	375000
<input type="checkbox"/>	<input type="button" value="Edit"/> <input type="button" value="Copy"/> <input type="button" value="Delete"/>	14	Active	2	NULL	15	11	5	13	2	4	2000-07-07	Y	N	N	NULL	780000
<input type="checkbox"/>	<input type="button" value="Edit"/> <input type="button" value="Copy"/> <input type="button" value="Delete"/>	15	Active	2	NULL	17	1	1	2	3	2	2018-06-29	Y	Y	N	NULL	925000
<input type="checkbox"/>	<input type="button" value="Edit"/> <input type="button" value="Copy"/> <input type="button" value="Delete"/>	16	Active	1	NULL	19	5	1	8	2	1	2002-12-23	Y	Y	N	NULL	480000
<input type="checkbox"/>	<input type="button" value="Edit"/> <input type="button" value="Copy"/> <input type="button" value="Delete"/>	17	Active	3	2	9	2	1	20	1	1	1963-02-01	N	Y	N	2017-05-21	400000
<input type="checkbox"/>	<input type="button" value="Edit"/> <input type="button" value="Copy"/> <input type="button" value="Delete"/>	18	Active	3	10	6	3	5	5	3	2	1990-01-01	Y	N	N	2019-01-02	575000
<input type="checkbox"/>	<input type="button" value="Edit"/> <input type="button" value="Copy"/> <input type="button" value="Delete"/>	19	Active	3	10	4	1	2	12	1	1	1992-04-23	Y	Y	N	2021-04-02	320000
<input type="checkbox"/>	<input type="button" value="Edit"/> <input type="button" value="Copy"/> <input type="button" value="Delete"/>	20	Active	3	5	11	5	4	19	0	0	0000-00-00	N	N	Y	2022-01-01	950000

B) Queries

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

```
CREATE VIEW rep_prop AS
```

```
SELECT e.first_name AS `RepFirstName`,e.last_name AS `RepLastName` ,
```

p.property_id AS 'prop_id', p.status_id, p.type_id, p.num_bedrooms AS '#Beds', p.num_bathrooms AS '#Baths', p.price, r.supervisor_id FROM representative r

INNER JOIN property p ON r.rep_id=p.rep_id

INNER JOIN employee e ON r.emp_id=e.emp_id

ORDER BY p.property_id;

```
CREATE VIEW supervisors AS  
SELECT e.emp_id,r.rep_id,e.first_name,e.last_name FROM representative r  
INNER JOIN employee e ON e.emp_id=r.emp_id  
WHERE supervisor_id IS null;
```

```
MariaDB [myhomes]> CREATE VIEW supervisors AS
    -> SELECT e.emp_id,r.rep_id,e.first_name,e.last_name FROM representative r
    -> INNER JOIN employee e ON e.emp_id=r.emp_id
    -> WHERE supervisor_id IS null;
Query OK, 0 rows affected (0.014 sec)

MariaDB [myhomes]> select * from supervisors;
+-----+-----+-----+-----+
| emp_id | rep_id | first_name | last_name |
+-----+-----+-----+-----+
|     8  |     6  | Bezalel    | Simmel    |
|    12  |     7  | Anneke    | Preu      |
|     9  |     8  | Georgi    | Facello   |
|     7  |     9  | Susan     | Doyle     |
|     6  |    10  | Bill      | Joe       |
+-----+-----+-----+-----+
5 rows in set (0.001 sec)
```

```
SELECT v.* , e.first_name AS 'SupervisorFirstName' , e.last_name AS 'SupervisorLastName'  
FROM rep_prop v  
LEFT JOIN supervisors s ON s.rep_id = v.supervisor_id  
INNER JOIN employee e ON s.emp_id=e.emp_id;
```

RepFirstName	RepLastName	prop_id	status_id	type_id	#Beds	#Baths	price	supervisor_id	SupervisorFirstName	SupervisorLastName
Esra	Aynali	1	1	1	2	1	765000	6	Bezalel	Simmel
Esra	Aynali	2	1	2	1	1	250000	6	Bezalel	Simmel
Parto	Bamford	3	1	1	3	2	1000000	8	Georgi	Facello
John	Green	4	2	2	2	1	450750	7	Anneke	Preu
Parto	Bamford	5	2	5	1	1	800000	8	Georgi	Facello
Esra	Aynali	6	1	1	2	2	625000	6	Bezalel	Simmel
Alex	Turner	7	3	1	2	1	475000	8	Georgi	Facello
Eva	Doe	8	3	2	1	1	350000	9	Susan	Doyle
John	Green	11	3	5	1	1	420000	7	Anneke	Preu
Esra	Aynali	12	1	2	2	2	425000	6	Bezalel	Simmel
Parto	Bamford	13	1	2	2	1	375000	8	Georgi	Facello
Kemal	Araz	14	2	5	2	4	780000	10	Bill	Joe
Esra	Aynali	15	2	1	3	2	925000	6	Bezalel	Simmel
Eva	Doe	16	1	1	2	1	480000	9	Susan	Doyle
Parto	Bamford	17	3	1	1	1	400000	8	Georgi	Facello
John	Green	18	3	5	3	2	575000	7	Anneke	Preu
Esra	Aynali	19	3	2	1	1	320000	6	Bezalel	Simmel
Eva	Doe	20	3	4	0	0	950000	9	Susan	Doyle

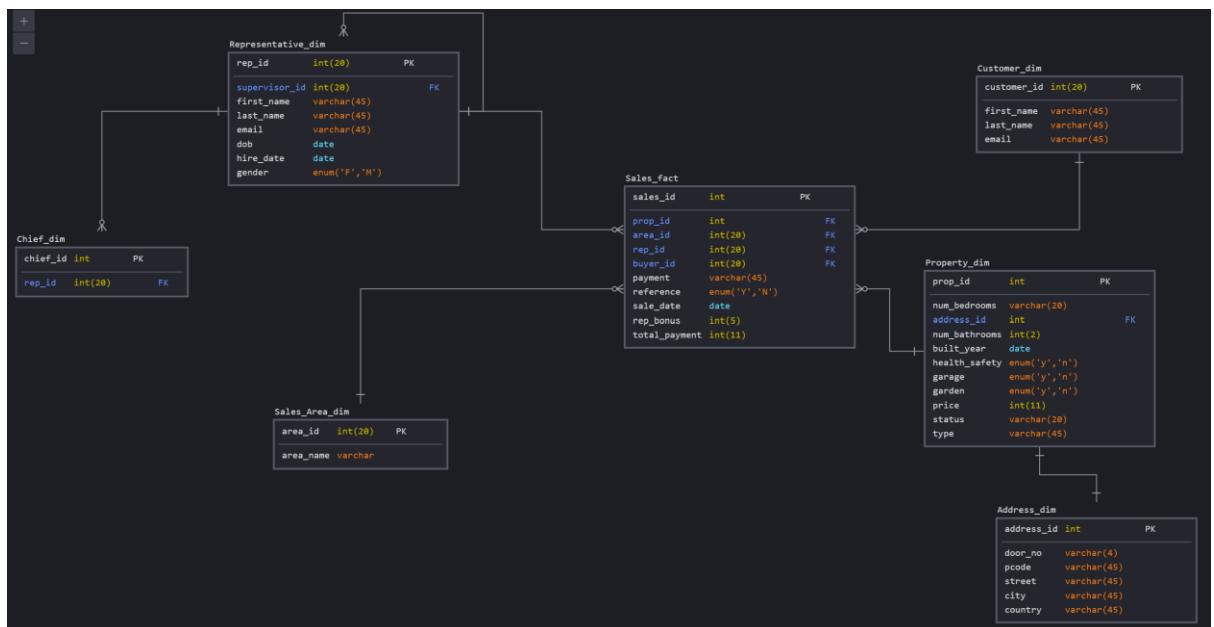
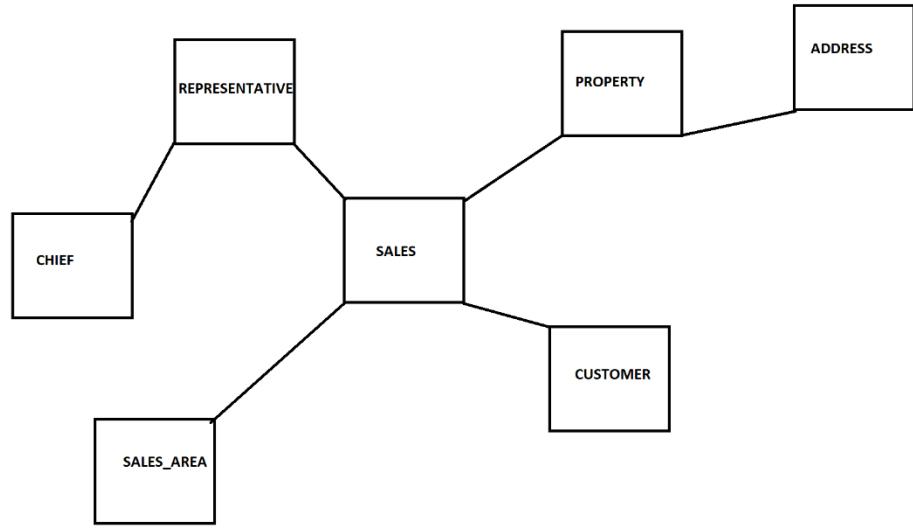
b. Display details of customers together with details of their areas and names of the managers of their areas.

```
SELECT c.first_name AS 'CustomerFirstName',c.last_name AS
'CustomerLastName',p.address_id, sa.area_name,e.first_name AS
'ManagerFirstName',e.last_name AS 'ManagerLastName' FROM customer c
LEFT JOIN property p ON (p.seller_id=c.customer_id or p.buyer_id=c.customer_id)
INNER JOIN address a ON (a.address_id = p.address_id)
INNER JOIN sales_area sa ON sa.area_id = a.area_id
INNER JOIN area_rep ar ON ar.area_id = sa.area_id
INNER JOIN chief_salesperson cs ON cs.chief_id = ar.chief_id
INNER JOIN employee e ON e.emp_id=cs.emp_id;
```

```
MariaDB [myhomes]> SELECT c.first_name AS 'CustomerFirstName',c.last_name AS 'CustomerLastName',p.address_id,
sa.area_name,e.first_name AS 'ManagerFirstName',e.last_name AS 'ManagerLastName' FROM customer c
-> LEFT JOIN property p ON (p.seller_id=c.customer_id or p.buyer_id=c.customer_id)
-> INNER JOIN address a ON (a.address_id = p.address_id)
-> INNER JOIN sales_area sa ON sa.area_id = a.area_id
-> INNER JOIN area_rep ar ON ar.area_id = sa.area_id
-> INNER JOIN chief_salesperson cs ON cs.chief_id = ar.chief_id
-> INNER JOIN employee e ON e.emp_id=cs.emp_id;
+-----+-----+-----+-----+-----+-----+
| CustomerFirstName | CustomerLastName | address_id | area_name | ManagerFirstName | ManagerLastName |
+-----+-----+-----+-----+-----+-----+
| Matt             | Holders          | 1           | D04       | Bill            | Joe              |
| Hazel            | March             | 2           | D04       | Bill            | Joe              |
| Simon            | Harg              | 12          | D04       | Bill            | Joe              |
| Lola              | Snow              | 12          | D04       | Bill            | Joe              |
| Jamie             | Cook              | 9           | D01       | Bill            | Joe              |
| Andrea            | Cult              | 10          | D01       | Bill            | Joe              |
| Natalie           | Iris              | 4           | Sisli     | Susan           | Doyle            |
| Brendon           | Flow              | 17          | Sisli     | Susan           | Doyle            |
| David             | Bold              | 20          | Sisli     | Susan           | Doyle            |
| Sam               | Butler            | 20          | Sisli     | Susan           | Doyle            |
| Andrea            | Cult              | 5           | T12       | Susan           | Doyle            |
| Lola              | Snow              | 5           | T12       | Susan           | Doyle            |
| Alexa              | Simon             | 6           | T12       | Susan           | Doyle            |
| Andy               | Philip             | 6           | T12       | Susan           | Doyle            |
| Sam               | Butler            | 7           | T12       | Susan           | Doyle            |
| Nick              | Suv               | 15          | De Wallen | Susan           | Doyle            |
| Tom               | Anderson          | 15          | De Wallen | Susan           | Doyle            |
| Alex               | Blee              | 16          | Casal Morena | Susan           | Doyle            |
| Hazel              | March             | 16          | Casal Morena | Susan           | Doyle            |
| Sean               | Connor            | 3           | Karsiyaka | Georgi          | Facello          |
| Natalie           | Iris              | 3           | Karsiyaka | Georgi          | Facello          |
| Eileen             | Murray            | 19          | Karsiyaka | Georgi          | Facello          |
| Kate               | Viny              | 19          | Karsiyaka | Georgi          | Facello          |
| Nick               | Suv               | 13          | Covent    | Georgi          | Facello          |
| Simon              | Harg              | 11          | D09       | Anneke          | Preu             |
| Felix              | Gun               | 14          | Greystones | Anneke          | Preu             |
| Jamie              | Cook              | 14          | Greystones | Anneke          | Preu             |
| Andy               | Philip             | 8           | Gaziosmanpasa | Anneke          | Preu             |
| Kate               | Viny              | 18          | Ballybane | Anneke          | Preu             |
+-----+-----+-----+-----+-----+-----+
29 rows in set (0.001 sec)
```

Part 3

A) Dimensional Model



B) Creating Tables

```

CREATE TABLE representative_dim(rep_id int(20) NOT NULL,
supervisor_id int(20), first_name varchar(45) NOT NULL, last_name varchar(45) NOT NULL,
email varchar(45) NOT NULL, dob date, hire_date date NOT NULL,
gender ENUM ('F','M'), PRIMARY KEY(rep_id),
FOREIGN KEY (supervisor_id) REFERENCES representative_dim (rep_id));

```

```

CREATE TABLE chief_dim(chief_id int NOT NULL,
rep_id int(20) NOT NULL, PRIMARY KEY (chief_id),
FOREIGN KEY (rep_id) REFERENCES representative_dim(rep_id));

```

```
CREATE TABLE customer_dim(customer_id int(20) NOT NULL,  
first_name varchar(45) NOT NULL, last_name varchar(45) NOT NULL,  
email varchar(45) NOT NULL,  
PRIMARY KEY(customer_id));
```

```
CREATE TABLE sales_area_dim(area_id int(20) NOT NULL,  
area_name varchar(45) NOT NULL,  
PRIMARY KEY (area_id));
```

```
CREATE TABLE address_dim(address_id int(30) NOT NULL,  
PCODE varchar(10) NOT NULL,  
door_no varchar(4) NOT NULL,street varchar(45) NOT NULL,  
city varchar(45) NOT NULL, country varchar(45) NOT NULL,  
PRIMARY KEY (address_id));
```

```
CREATE TABLE property_dim(property_id int NOT NULL,  
num_bedrooms int(2) NOT NULL, num_bathrooms int(2) NOT NULL,  
address_id int(30) NOT NULL,  
built_year date, health_safety ENUM('Y', 'N') NOT NULL,  
garage ENUM('Y', 'N') NOT NULL, garden ENUM('Y', 'N') NOT NULL,  
price int(11) NOT NULL,  
status varchar(45) NOT NULL,  
type varchar(45) NOT NULL,  
PRIMARY KEY (property_id),  
FOREIGN KEY (address_id) REFERENCES address_dim(address_id));
```

```
CREATE TABLE sales_fact(sales_id int NOT NULL,  
property_id int NOT NULL, rep_id int(20) NOT NULL,  
buyer_id int(20) NOT NULL, area_id int(20) NOT NULL,  
sold_date date NOT NULL, rep_bonus int(5),  
total_payment int(11) NOT NULL, reference enum('Y','N'),  
payment varchar(45) NOT NULL, PRIMARY KEY(sales_id),  
FOREIGN KEY(property_id) REFERENCES property_dim(property_id),  
FOREIGN KEY(rep_id) REFERENCES representative_dim(rep_id),  
FOREIGN KEY(area_id) REFERENCES sales_area_dim(area_id),  
FOREIGN KEY(buyer_id) REFERENCES customer_dim(customer_id));
```

```

MariaDB [myhomes]> CREATE TABLE representative_dim(rep_id int(20) NOT NULL,
-> supervisor_id int(20),
-> first_name varchar(45) NOT NULL, last_name varchar(45) NOT NULL,
-> email varchar(45) NOT NULL,
-> dob date, hire_date date NOT NULL,
-> gender ENUM ('F', 'M'),
-> PRIMARY KEY(rep_id),
-> FOREIGN KEY (supervisor_id) REFERENCES representative_dim (rep_id));
Query OK, 0 rows affected (0.078 sec)

MariaDB [myhomes]> CREATE TABLE chief_dim(chief_id int NOT NULL,
-> rep_id int(20) NOT NULL,
-> PRIMARY KEY (chief_id),
-> FOREIGN KEY (rep_id) REFERENCES representative_dim(rep_id));
Query OK, 0 rows affected (0.028 sec)

MariaDB [myhomes]> CREATE TABLE customer_dim(customer_id int(20) NOT NULL,
-> first_name varchar(45) NOT NULL, last_name varchar(45) NOT NULL,
-> email varchar(45) NOT NULL,
-> PRIMARY KEY(customer_id));
Query OK, 0 rows affected (0.026 sec)

```

```

MariaDB [myhomes]> CREATE TABLE sales_area_dim(area_id int(20) NOT NULL,
-> area_name varchar(45) NOT NULL,
-> PRIMARY KEY (area_id));
Query OK, 0 rows affected (0.025 sec)

MariaDB [myhomes]> CREATE TABLE address_dim(address_id int(30) NOT NULL,
-> area_id int(20) NOT NULL, pcode varchar(10) NOT NULL,
-> door_no varchar(4) NOT NULL, street varchar(45) NOT NULL,
-> city varchar(45) NOT NULL, country varchar(45) NOT NULL,
-> PRIMARY KEY (address_id),
-> FOREIGN KEY (area_id) REFERENCES sales_area_dim (area_id));
Query OK, 0 rows affected (0.025 sec)

MariaDB [myhomes]> CREATE TABLE property_dim(property_id int NOT NULL,
-> num_bedrooms int(2) NOT NULL, num_bathrooms int(2) NOT NULL,
-> address_id int(30) NOT NULL,
-> built_year date, health_safety ENUM('Y', 'N') NOT NULL,
-> garage ENUM('Y', 'N') NOT NULL, garden ENUM('Y', 'N') NOT NULL,
-> size float NOT NULL, price int(11) NOT NULL,
-> status varchar(45) NOT NULL,
-> type varchar(45) NOT NULL,
-> PRIMARY KEY (property_id),
-> FOREIGN KEY (address_id) REFERENCES address_dim(address_id));
Query OK, 0 rows affected (0.025 sec)

```

```

MariaDB [myhomes]> CREATE TABLE sales_fact(sales_id int NOT NULL,
-> property_id int NOT NULL, rep_id int(20) NOT NULL,
-> buyer_id int(20) NOT NULL, area_id int(20) NOT NULL,
-> sold_date date NOT NULL,
-> rep_bonus int(5),
-> total_payment int(11) NOT NULL,
-> reference enum('Y','N'),
-> payment varchar(45) NOT NULL,
-> PRIMARY KEY(sales_id),
-> FOREIGN KEY(property_id) REFERENCES property_dim(property_id),
-> FOREIGN KEY(rep_id) REFERENCES representative_dim(rep_id),
-> FOREIGN KEY(area_id) REFERENCES sales_area_dim(area_id),
-> FOREIGN KEY(buyer_id) REFERENCES customer_dim(customer_id));
Query OK, 0 rows affected (0.024 sec)

```

C) ETL

Extract customer table as csv file from mysql – to demonstrate different data source types

The screenshot shows the MySQL Workbench interface for exporting data from the 'customer' table. The top navigation bar includes 'Server: 127.0.0.1', 'Database: myhomes', and 'Table: customer'. Below the navigation are tabs: Browse, Structure, SQL, Search, Insert, Export, Import, Privileges, Operations, and Triggers. A sub-menu bar below the tabs includes 'Profiling', 'Edit inline', 'Edit', 'Explain SQL', 'Create PHP code', and 'Refresh'. The main area displays the following configuration:

- SQL query:** An empty text input field with a 'Show SQL query' button.
- Export method:** A radio button group where 'Quick - display only the minimal options' is selected, and 'Custom - display all possible options' is unselected.
- Format:** A dropdown menu set to 'CSV'.
- Rows:** A section with three options:
 - 'Dump some row(s)':
 - 'Number of rows:' input field containing '20'.
 - 'Row to begin at:' input field containing '0'.
 - 'Dump all rows': This option is selected, indicated by a checked radio button.
- Go**: A small button located at the bottom right of the form.

	A	B	C	D	E	F	G	H	I	J	K
1	customer_id	rep_id	first_name	last_name	email						
2	1	1	Alex	Blee	alexb@gmail.com						
3	2	3	David	Bold	david@hotmail.com						
4	3	2	Felix	Gun	fgun@gmail.com						
5	4	1	Simon	Harg	simon@yahoo.com						
6	5	3	Elieen	Murray	elieenm@gmail.com						
7	6	2	Andrea	Cult	andrea.cult@gmail.com						
8	7	4	Brendon	Flow	brendonf@gmail.com						
9	8	4	Sean	Connor	sconner@gmail.com						
10	9	6	Sam	Butler	samb@gmail.com						
11	10	5	Lola	Snow	lola@yahoo.com						
12	11	6	Kate	Viny	kateviny@gmail.com						
13	12	5	Matt	Helders	mholders@gmail.com						
14	13	7	Jamie	Cook	jcook@gmail.com						
15	14	9	Natalie	Iris	nataliris@gmail.com						
16	15	8	Nick	Suv	nicko@yahoo.com						
17	16	8	Alexa	Simon	alexasimon@gmail.com						
18	17	7	Hazel	March	hmarch@gmail.com						
19	18	9	Tom	Anderson	tomanderson@gmail.com						
20	19	11	Andy	Philip	andyo@hotmail.com						
21	20	11	Bob	Bean	beanbob@gmail.com						
22											
23											
24											

Extract other tables with mysql connector

Installing mysql connector

```
(base) C:\Users\esraa>conda activate albany

(albany) C:\Users\esraa>pip install mysql-connector-python
Collecting mysql-connector-python
  Downloading mysql_connector_python-8.0.28-cp38-cp38-win_amd64.whl (7.2 MB)
    |████████| 7.2 MB 2.2 MB/s
Collecting protobuf>=3.0.0
  Downloading protobuf-3.19.4-cp38-cp38-win_amd64.whl (895 kB)
    |████████| 895 kB 6.8 MB/s
Installing collected packages: protobuf, mysql-connector-python
Successfully installed mysql-connector-python-8.0.28 protobuf-3.19.4
```

NOTE Please check assessment_py script for ETL steps.

Needed more sold properties;

So I check properties for sale and sale agreed;(not sold)

```
select p.* , a.area_id from property p
inner join address a on a.address_id=p.address_id
where buyer_id is null;
```

```
MariaDB [myhomes]> select p.* , a.area_id from property p
-> inner join address a on a.address_id=p.address_id
-> where buyer_id is null;
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| property_id | status_id | buyer_id | seller_id | rep_id | type_id | address_id | num_bedrooms | num_bathrooms | built_year | health_safety | garage | garden | sold_date | price | area_id |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| 1 | 1 | NULL | 4 | 1 | 1 | 11 | 2 | 1 | 1874-01-06 | N | Y | Y | NULL | 765000 | 4 |
| 2 | 1 | NULL | 6 | 1 | 2 | 10 | 1 | 1 | 1950-01-01 | Y | N | N | NULL | 250000 | 2 |
| 3 | 1 | NULL | 7 | 2 | 1 | 17 | 3 | 2 | 2021-03-25 | Y | Y | N | NULL | 1000000 | 5 |
| 4 | 2 | NULL | 9 | 3 | 2 | 7 | 2 | 1 | 2000-06-12 | Y | N | N | NULL | 450750 | 6 |
| 5 | 2 | NULL | 11 | 2 | 5 | 18 | 1 | 1 | 2017-11-26 | Y | N | N | NULL | 800000 | 13 |
| 6 | 1 | NULL | 12 | 1 | 1 | 1 | 2 | 2 | 2018-02-14 | Y | Y | Y | NULL | 625000 | 1 |
| 12 | 1 | NULL | 13 | 1 | 2 | 9 | 2 | 2 | 1957-03-26 | Y | N | N | NULL | 425000 | 2 |
| 13 | 1 | NULL | 14 | 2 | 2 | 4 | 2 | 1 | 1960-05-24 | Y | N | N | NULL | 375000 | 5 |
| 14 | 2 | NULL | 15 | 11 | 5 | 13 | 2 | 4 | 2000-07-07 | Y | N | N | NULL | 780000 | 10 |
| 15 | 2 | NULL | 17 | 1 | 1 | 2 | 3 | 2 | 2018-06-29 | Y | Y | Y | NULL | 925000 | 1 |
| 16 | 1 | NULL | 19 | 5 | 1 | 8 | 2 | 1 | 2002-12-23 | Y | Y | Y | NULL | 480000 | 8 |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
11 rows in set (0.001 sec)
```

I updated the status_id,buyer_id,sold_date columns in fo_sale manually from mysql admin

property																		
	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	property_id	status_id	buyer_id	seller_id	rep_id	type_id	address_id	num_bedrooms	num_bathrooms	built_year	health_safety	garage	garden	sold_date	price
<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	1	3	20	4	1	1	11	2	1	1874-01-06	N	Y	Y	2022-01-14	765000
<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	2	3	11	6	1	2	10	1	1	1950-01-01	Y	N	N	2021-09-14	250000
<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	3	3	14	7	2	1	17	3	2	2021-03-25	Y	Y	N	2022-02-03	1000000
<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	4	3	17	9	3	2	7	2	1	2000-06-12	Y	N	N	2021-07-20	450750
<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	5	3	4	11	2	5	18	1	1	2017-11-26	Y	N	N	2021-08-29	800000
<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	6	3	6	12	1	1	1	2	2	2018-02-14	Y	Y	Y	2020-05-17	625000
<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	7	3	7	13	4	1	14	2	1	1980-04-25	Y	N	Y	2020-12-05	475000
<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	8	3	8	14	5	2	3	1	1	2000-02-08	Y	Y	N	2022-02-01	350000
<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	9	3	18	15	6	2	15	1	1	NULL	Y	Y	N	2018-01-23	300000
<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	10	3	1	17	6	3	16	1	1	2022-01-12	Y	N	Y	2022-02-05	345250
<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	11	3	16	19	3	5	6	1	1	NULL	Y	N	N	2001-05-29	420000
<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	12	3	7	13	1	2	9	2	2	1957-03-26	Y	N	N	2021-03-26	425000
<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	13	3	9	14	2	2	4	2	1	1960-05-24	Y	N	N	2018-02-10	375000
<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	14	3	13	15	11	5	13	2	4	2000-07-07	Y	N	N	2022-01-18	780000
<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	15	3	12	17	1	1	2	3	2	2018-06-29	Y	Y	Y	2021-11-10	925000
<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	16	3	15	19	5	1	8	2	1	2002-12-23	Y	Y	Y	2021-10-11	480000
<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	17	3	2	9	2	1	20	1	1	1963-02-01	N	Y	N	2017-05-26	400000
<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	18	3	10	6	3	5	5	3	2	1990-01-01	Y	N	N	2019-01-27	575000
<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	19	3	10	4	1	2	12	1	1	1992-04-23	Y	Y	N	2021-04-23	320000
<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	20	3	5	11	5	4	19	0	0	0000-00-00	N	N	Y	2022-01-05	950000

After loading data in assessment_py I checked the tables from mysql:

Loaded representative_dim:

SELECT * FROM `representative_dim`										
<input type="checkbox"/> Profiling [Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]										
<input type="checkbox"/> Show all Number of rows: 25 <input type="button" value="▼"/> Filter rows: Search this table Sort by key: None <input type="button" value="▼"/>										
+ Options										
rep_id	supervisor_id	first_name	last_name	email	hire_date	dob	gender			
<input type="checkbox"/>   	1	Era	Aynali	eaynali@myhomes.com	2022-01-17	1992-04-23	F			
<input type="checkbox"/>   	2	Parto	Bamford	pbamford@myhomes.com	2002-05-01	1986-12-01	M			
<input type="checkbox"/>   	3	John	Green	jgreen@myhomes.com	2000-05-14	1988-07-23	M			
<input type="checkbox"/>   	4	Alex	Turner	aturner@myhomes.com	2008-01-27	1990-06-05	M			
<input type="checkbox"/>   	5	Eva	Doe	edoe@myhomes.com	2021-04-23	1984-03-04	F			
<input type="checkbox"/>   	6	Bezalel	Simmel	bsimmel@myhomes.com	1985-11-21	1964-06-02	F			
<input type="checkbox"/>   	7	Anneke	Preu	apreu@myhomes.com	1989-06-02	1953-04-20	F			
<input type="checkbox"/>   	8	Georgi	Facello	gfacello@myhomes.com	1986-06-26	1953-09-02	M			
<input type="checkbox"/>   	9	Susan	Doyle	sdoyle@myhomes.com	2000-04-06	1970-03-06	F			
<input type="checkbox"/>   	10	Bill	Joe	bjoe@myhomes.com	1999-06-05	1968-01-08	M			
<input type="checkbox"/>   	11	Kemal	Araz	karaz@myhomes.com	2021-07-05	1991-05-29	M			

Sales_area_dim

SELECT * FROM `sales_area_dim`	
<input type="checkbox"/> Profiling [Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]	
<input type="checkbox"/> Show all Number of rows: 25 <input type="button" value="▼"/> Filter rows: Search	
+ Options	
area_id	area_name
<input type="checkbox"/>   	D04
<input type="checkbox"/>   	D01
<input type="checkbox"/>   	Karsiyaka
<input type="checkbox"/>   	D09
<input type="checkbox"/>   	Sisli
<input type="checkbox"/>   	T12
<input type="checkbox"/>   	Greystones
<input type="checkbox"/>   	Gaziosmanpasa
<input type="checkbox"/>   	Westminster
<input type="checkbox"/>   	Covent
<input type="checkbox"/>   	De Wallen
<input type="checkbox"/>   	Casal Morena
<input type="checkbox"/>   	Ballybane

Customer_dim:

```
SELECT * FROM `customer_dim`
```

Profiling [Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]

Show all

Number of rows: 25

Filter rows:

Search this table

Sort by key:

N

· Options

				customer_id	first_name	last_name	email
<input type="checkbox"/>				1	Alex	Blee	alexb@gmail.com
<input type="checkbox"/>				2	David	Bold	david@hotmail.com
<input type="checkbox"/>				3	Felix	Gun	fgun@gmail.com
<input type="checkbox"/>				4	Simon	Harg	simon@yahoo.com
<input type="checkbox"/>				5	Elieen	Murray	elieenm@gmail.com
<input type="checkbox"/>				6	Andrea	Cult	andrea.cult@gmail.com
<input type="checkbox"/>				7	Brendon	Flow	brendonf@gmail.com
<input type="checkbox"/>				8	Sean	Connor	sconner@gmail.com
<input type="checkbox"/>				9	Sam	Butler	samb@gmail.com
<input type="checkbox"/>				10	Lola	Snow	lola@yahoo.com
<input type="checkbox"/>				11	Kate	Viny	kateviny@gmail.com
<input type="checkbox"/>				12	Matt	Helders	mhelders@gmail.com
<input type="checkbox"/>				13	Jamie	Cook	jcook@gmail.com
<input type="checkbox"/>				14	Natalie	Iris	nataliris@gmail.com
<input type="checkbox"/>				15	Nick	Suv	nicko@yahoo.com
<input type="checkbox"/>				16	Alexa	Simon	alexasimon@gmail.com
<input type="checkbox"/>				17	Hazel	March	hmarch@gmail.com
<input type="checkbox"/>				18	Tom	Anderson	tomanderson@gmail.com
<input type="checkbox"/>				19	Andy	Philip	andyo@hotmail.com
<input type="checkbox"/>				20	Bob	Bean	beanbob@gmail.com

Address_dim:

```
SELECT * FROM `address_dim`
```

Profiling [Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]

Show all

Number of rows: 25 ▾

Filter rows:

Search this table

Sort by key: None

+ Options

	<input type="checkbox"/>				address_id	pcode	door_no	street	city	country
	<input type="checkbox"/>				1	D04P8X4	3	Herbert Cottages	Dublin	Ireland
	<input type="checkbox"/>				2	D04P8X4	4	Herbert Cottages	Dublin	Ireland
	<input type="checkbox"/>				3	35530	36	2040	Izmir	Turkey
	<input type="checkbox"/>				4	34460	9	Kevser	Istanbul	Turkey
	<input type="checkbox"/>				5	T12T2X2	12	Hillside Grove	Cork	Ireland
	<input type="checkbox"/>				6	T12T2X2	35	Hillside Grove	Cork	Ireland
	<input type="checkbox"/>				7	T12YFV0	9B	Princes Street	Cork	Ireland
	<input type="checkbox"/>				8	06589	9	Birlik	Ankara	Turkey
	<input type="checkbox"/>				9	D01KD63	98	Upper Dorset Street	Dublin	Ireland
	<input type="checkbox"/>				10	D01KD63	94	Upper Dorset Street	Dublin	Ireland
	<input type="checkbox"/>				11	D09P3T4	9	Iona Drive	Dublin	Ireland
	<input type="checkbox"/>				12	D04P8X4	12	Herbert Cottages	Dublin	Ireland
	<input type="checkbox"/>				13	W1T3NF	221B	Barners Street	London	UK
	<input type="checkbox"/>				14	H91TFY2	102	Tuam Road	Galway	Ireland
	<input type="checkbox"/>				15	1012	103	Noord-Holland	Amsterdam	Netherlands
	<input type="checkbox"/>				16	00118	0	Acquaformosa	Rome	Italy
	<input type="checkbox"/>				17	34460	67	Kevser	Istanbul	Turkey
	<input type="checkbox"/>				18	V94D7YD	87B	Oakland Drive	Limerick	Ireland
	<input type="checkbox"/>				19	35530	0	2040	Izmir	Turkey
	<input type="checkbox"/>				20	T12YFV0	3	Princes Street	Cork	Ireland

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Property_dim:

```
SELECT * FROM `property_dim`
```

Profiling [Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]

<input type="checkbox"/> Show all	Number of rows:	25	Filter rows:	Search this table	Sort by key:	None					
+ Options											
	property_id	status	type	address_id	num_bedrooms	num_bathrooms	built_year	health_safety	garage	garden	price
<input type="checkbox"/>	1	3	1	11	2	1	1874-01-06	N	Y	Y	765000
<input type="checkbox"/>	2	3	2	10	1	1	1950-01-01	Y	N	N	250000
<input type="checkbox"/>	3	3	1	17	3	2	2021-03-25	Y	Y	N	1000000
<input type="checkbox"/>	4	3	2	7	2	1	2000-06-12	Y	N	N	450750
<input type="checkbox"/>	5	3	5	18	1	1	2017-11-26	Y	N	N	800000
<input type="checkbox"/>	6	3	1	1	2	2	2018-02-14	Y	Y	Y	625000
<input type="checkbox"/>	7	3	1	14	2	1	1980-04-25	Y	N	Y	475000
<input type="checkbox"/>	8	3	2	3	1	1	2000-02-08	Y	Y	N	350000
<input type="checkbox"/>	9	3	2	15	1	1	2012-12-31	Y	Y	N	300000
<input type="checkbox"/>	10	3	3	16	1	1	2022-01-12	Y	N	Y	345250
<input type="checkbox"/>	11	3	5	6	1	1	2012-12-31	Y	N	N	420000
<input type="checkbox"/>	12	3	2	9	2	2	1957-03-26	Y	N	N	425000
<input type="checkbox"/>	13	3	2	4	2	1	1960-05-24	Y	N	N	375000
<input type="checkbox"/>	14	3	5	13	2	4	2000-07-07	Y	N	N	780000
<input type="checkbox"/>	15	3	1	2	3	2	2018-06-29	Y	Y	Y	925000
<input type="checkbox"/>	16	3	1	8	2	1	2002-12-23	Y	Y	Y	480000
<input type="checkbox"/>	17	3	1	20	1	1	1963-02-01	N	Y	N	400000
<input type="checkbox"/>	18	3	5	5	3	2	1990-01-01	Y	N	N	575000
<input type="checkbox"/>	19	3	2	12	1	1	1992-04-23	Y	Y	N	320000
<input type="checkbox"/>	20	3	4	19	0	0	2012-12-31	N	N	Y	950000

Sales_fact:

```
SELECT * FROM `sales fact`
```

Profiling | [Edit inline](#) | [Edit](#) | [Explain SQL](#) | [Create PHP code](#) | [Refresh](#)

<input type="checkbox"/> Show all	Number of rows:	25	Filter rows:	Search this table	Sort by key:	None						
+ Options												
		sales_id	property_id	rep_id	buyer_id	area_id	sold_date	rep_bonus	total_payment	reference	payment	
<input type="checkbox"/>	 Edit	 Copy	 Delete	1	1	20	4	2022-01-14	7650	772650	N	installment
<input type="checkbox"/>	 Edit	 Copy	 Delete	2	1	11	2	2021-09-14	2500	252500	Y	cash
<input type="checkbox"/>	 Edit	 Copy	 Delete	3	2	14	5	2022-02-03	10000	1010000	Y	checks
<input type="checkbox"/>	 Edit	 Copy	 Delete	4	3	17	6	2021-07-20	4508	455258	N	cash
<input type="checkbox"/>	 Edit	 Copy	 Delete	5	2	4	13	2021-08-29	8000	808000	N	checks
<input type="checkbox"/>	 Edit	 Copy	 Delete	6	1	6	1	2020-05-17	6250	631250	Y	bank transfer
<input type="checkbox"/>	 Edit	 Copy	 Delete	7	4	7	7	2020-12-05	4750	479750	N	installment
<input type="checkbox"/>	 Edit	 Copy	 Delete	8	5	8	3	2022-02-01	3500	353500	Y	bank transfer
<input type="checkbox"/>	 Edit	 Copy	 Delete	9	6	18	11	2018-01-23	3000	303000	N	cash
<input type="checkbox"/>	 Edit	 Copy	 Delete	10	6	1	12	2022-02-05	3453	348703	N	checks
<input type="checkbox"/>	 Edit	 Copy	 Delete	11	3	16	6	2001-05-29	4200	424200	Y	bank transfer
<input type="checkbox"/>	 Edit	 Copy	 Delete	12	1	7	2	2021-03-26	4250	429250	Y	checks
<input type="checkbox"/>	 Edit	 Copy	 Delete	13	2	9	5	2018-02-10	3750	378750	N	cash
<input type="checkbox"/>	 Edit	 Copy	 Delete	14	11	13	10	2022-01-18	7800	787800	Y	checks
<input type="checkbox"/>	 Edit	 Copy	 Delete	15	1	12	1	2021-11-10	9250	934250	N	checks
<input type="checkbox"/>	 Edit	 Copy	 Delete	16	5	15	8	2021-10-11	4800	484800	Y	installment
<input type="checkbox"/>	 Edit	 Copy	 Delete	17	2	2	5	2017-05-26	4000	404000	Y	cash
<input type="checkbox"/>	 Edit	 Copy	 Delete	18	3	10	6	2019-01-27	5750	580750	Y	checks
<input type="checkbox"/>	 Edit	 Copy	 Delete	19	1	10	1	2021-04-23	3200	323200	N	cash
<input type="checkbox"/>	 Edit	 Copy	 Delete	20	5	5	3	2022-01-05	9500	959500	N	bank transfer

why some cities in various countries have good sales whilst others have not. You may make any reasonable assumptions to support your design (state any assumptions you make)?

```
select s.area_id,a.area_name,p.type,p.built_year,s.total_payment from sales_fact s
inner join sales_area_dim a on a.area_id=s.area_id
inner join property_dim p on p.property_id=s.property_id;
```

```
MariaDB [myhomes]> select s.area_id,a.area_name,p.type,s.total_payment from sales_fact s
-> inner join sales_area_dim a on a.area_id=s.area_id
-> inner join property_dim p on p.property_id=s.property_id;
+-----+-----+-----+
| area_id | area_name   | type      | total_payment |
+-----+-----+-----+
| 1       | D04        | house     | 631250
| 1       | D04        | house     | 934250
| 1       | D04        | flat/apartment | 323200
| 2       | D01        | flat/apartment | 252500
| 2       | D01        | flat/apartment | 429250
| 3       | Karsiyaka  | flat/apartment | 353500
| 3       | Karsiyaka  | land      | 959500
| 4       | D09        | house     | 772650
| 5       | Sisli      | house     | 1010000
| 5       | Sisli      | flat/apartment | 378750
| 5       | Sisli      | house     | 404000
| 6       | T12        | flat/apartment | 455258
| 6       | T12        | commercial property | 424200
| 6       | T12        | commercial property | 580750
| 7       | Greystones | house     | 479750
| 8       | Gaziosmanpasa | house     | 484800
| 10      | Covent     | commercial property | 787800
| 11      | De Wallen  | flat/apartment | 303000
| 12      | Casal Morena | bungalow | 348703
| 13      | Ballybane   | commercial property | 808000
+-----+-----+-----+
20 rows in set (0.001 sec)
```

```
select s.area_id,a.area_name,count(s.sales_id) AS '#Sold',sum(s.total_payment) AS 'TotalAreaPayment' from sales_fact s
inner join sales_area_dim a on a.area_id=s.area_id
inner join property_dim p on p.property_id=s.property_id
group by s.area_id
order by TotalAreaPayment desc;
```

```
MariaDB [myhomes]> select s.area_id,a.area_name,count(s.sales_id) AS '#Sold',sum(s.total_payment) AS 'TotalAreaPayment'
from sales_fact s
-> inner join sales_area_dim a on a.area_id=s.area_id
-> inner join property_dim p on p.property_id=s.property_id
-> group by s.area_id
-> order by TotalAreaPayment desc;
+-----+-----+-----+
| area_id | area_name   | #Sold | TotalAreaPayment |
+-----+-----+-----+
| 1       | D04        | 3    | 1888700
| 5       | Sisli      | 3    | 1792750
| 6       | T12        | 3    | 1460208
| 3       | Karsiyaka  | 2    | 1313000
| 13      | Ballybane   | 1    | 808000
| 10      | Covent     | 1    | 787800
| 4       | D09        | 1    | 772650
| 2       | D01        | 2    | 681750
| 8       | Gaziosmanpasa | 1    | 484800
| 7       | Greystones | 1    | 479750
| 12      | Casal Morena | 1    | 348703
| 11      | De Wallen  | 1    | 303000
+-----+-----+-----+
12 rows in set (0.001 sec)
```

Assumption 1- Some cities have more available property. For Dublin, it has 6 available property in 3 different sales areas.(area_id 1,4,2)

```

select s.area_id,a.area_name,p.type,p.built_year,s.total_payment from sales_fact s
inner join sales_area_dim a on a.area_id=s.area_id
inner join property_dim p on p.property_id=s.property_id
order by p.built_year;

```

```

MariaDB [myhomes]> select s.area_id,a.area_name,p.type,p.built_year,s.total_payment from sales_fact s
-> inner join sales_area_dim a on a.area_id=s.area_id
-> inner join property_dim p on p.property_id=s.property_id
-> order by p.built_year;
+-----+-----+-----+-----+-----+
| area_id | area_name | type | built_year | total_payment |
+-----+-----+-----+-----+-----+
| 4 | D09 | house | 1874-01-06 | 772650 |
| 2 | D01 | flat/apartment | 1950-01-01 | 252500 |
| 2 | D01 | flat/apartment | 1957-03-26 | 429250 |
| 5 | Sisli | flat/apartment | 1960-05-24 | 378750 |
| 5 | Sisli | house | 1963-02-01 | 404000 |
| 7 | Greystones | house | 1980-04-25 | 479750 |
| 6 | T12 | commercial property | 1990-01-01 | 580750 |
| 1 | D04 | flat/apartment | 1992-04-23 | 323200 |
| 3 | Karsiyaka | flat/apartment | 2000-02-08 | 353500 |
| 6 | T12 | flat/apartment | 2000-06-12 | 455258 |
| 10 | Covent | commercial property | 2000-07-07 | 787800 |
| 8 | Gaziosmanpasa | house | 2002-12-23 | 484800 |
| 3 | Karsiyaka | land | 2012-12-31 | 959500 |
| 11 | De Wallen | flat/apartment | 2012-12-31 | 303000 |
| 6 | T12 | commercial property | 2012-12-31 | 424200 |
| 13 | Ballybane | commercial property | 2017-11-26 | 808000 |
| 1 | D04 | house | 2018-02-14 | 631250 |
| 1 | D04 | house | 2018-06-29 | 934250 |
| 5 | Sisli | house | 2021-03-25 | 1010000 |
| 12 | Casal Morena | bungalow | 2022-01-12 | 348703 |
+-----+-----+-----+-----+-----+
20 rows in set (0.001 sec)

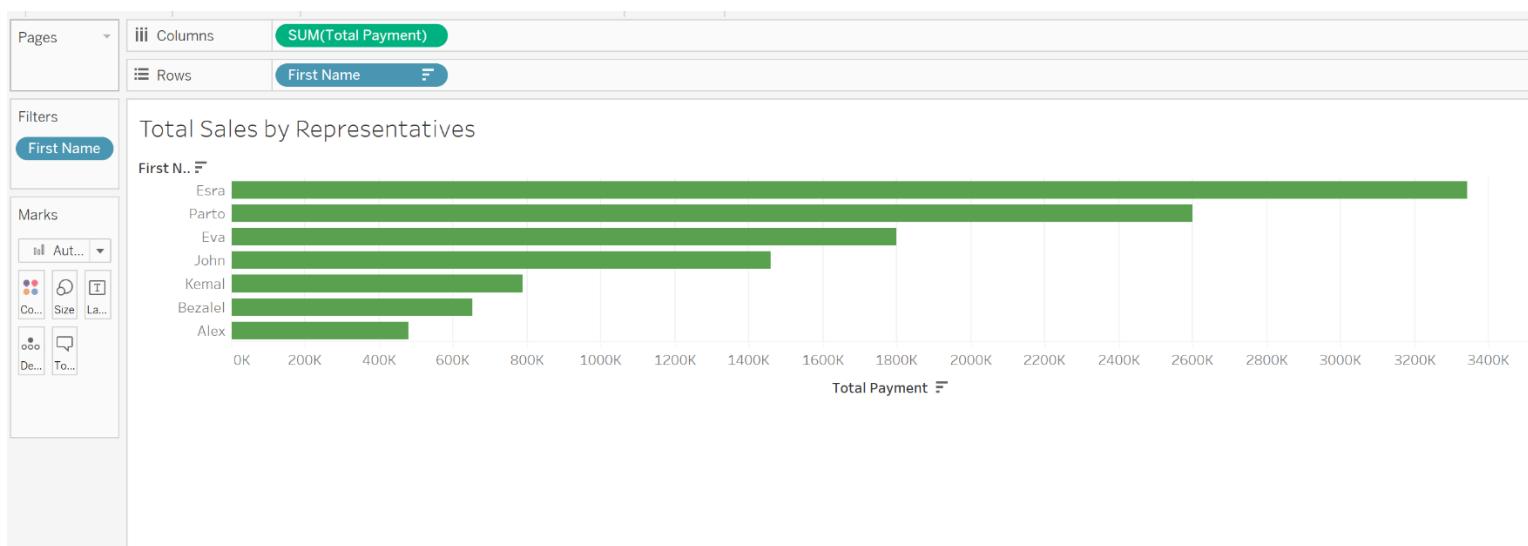
```

Assumption 2- People tend to buy old houses For example newest home in Dublin was built in 2018.

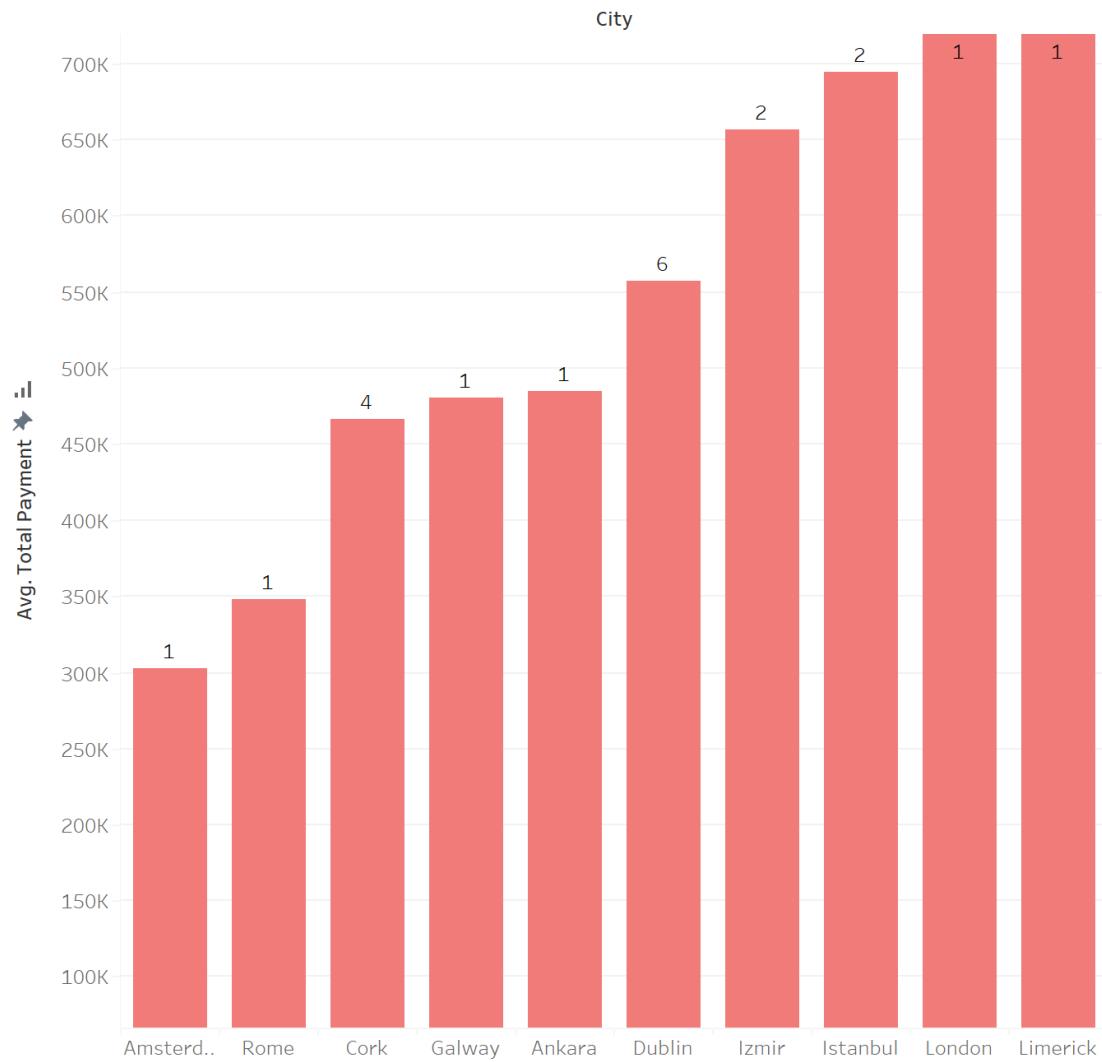
D) Data Visualization

Please also check jupyter notebook 'viz'

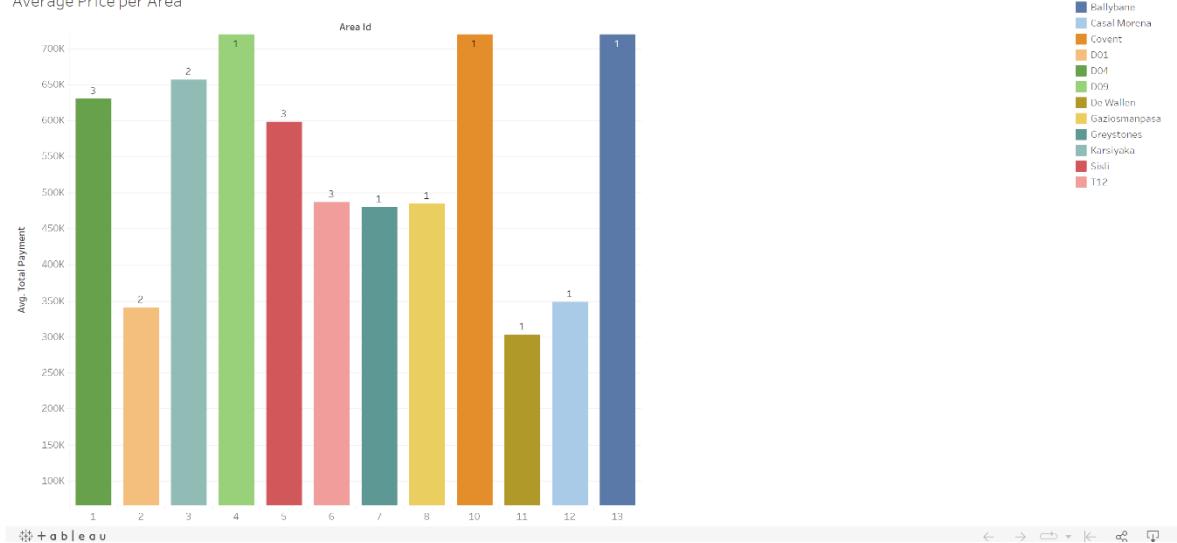
Visualisations from Tableau

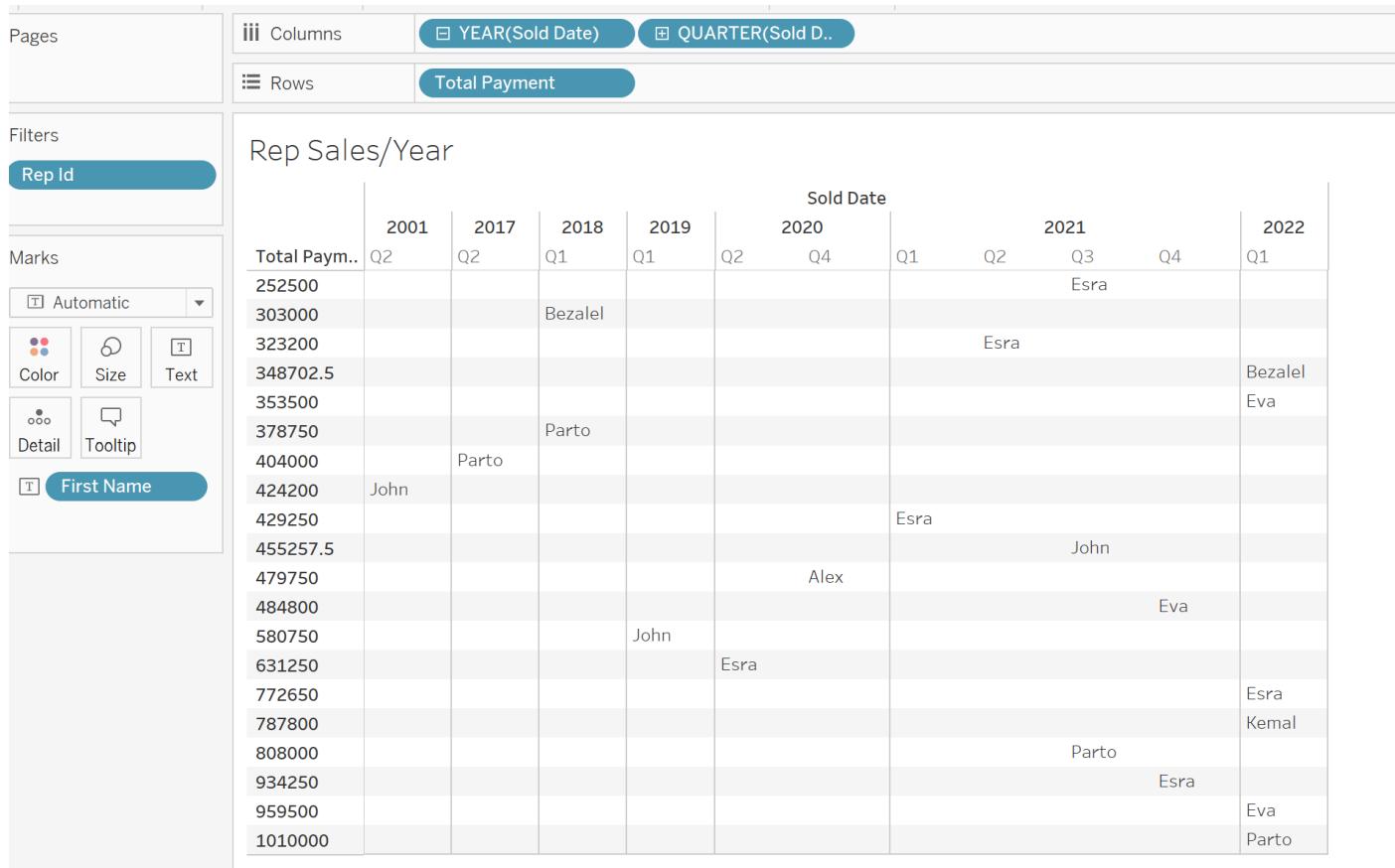
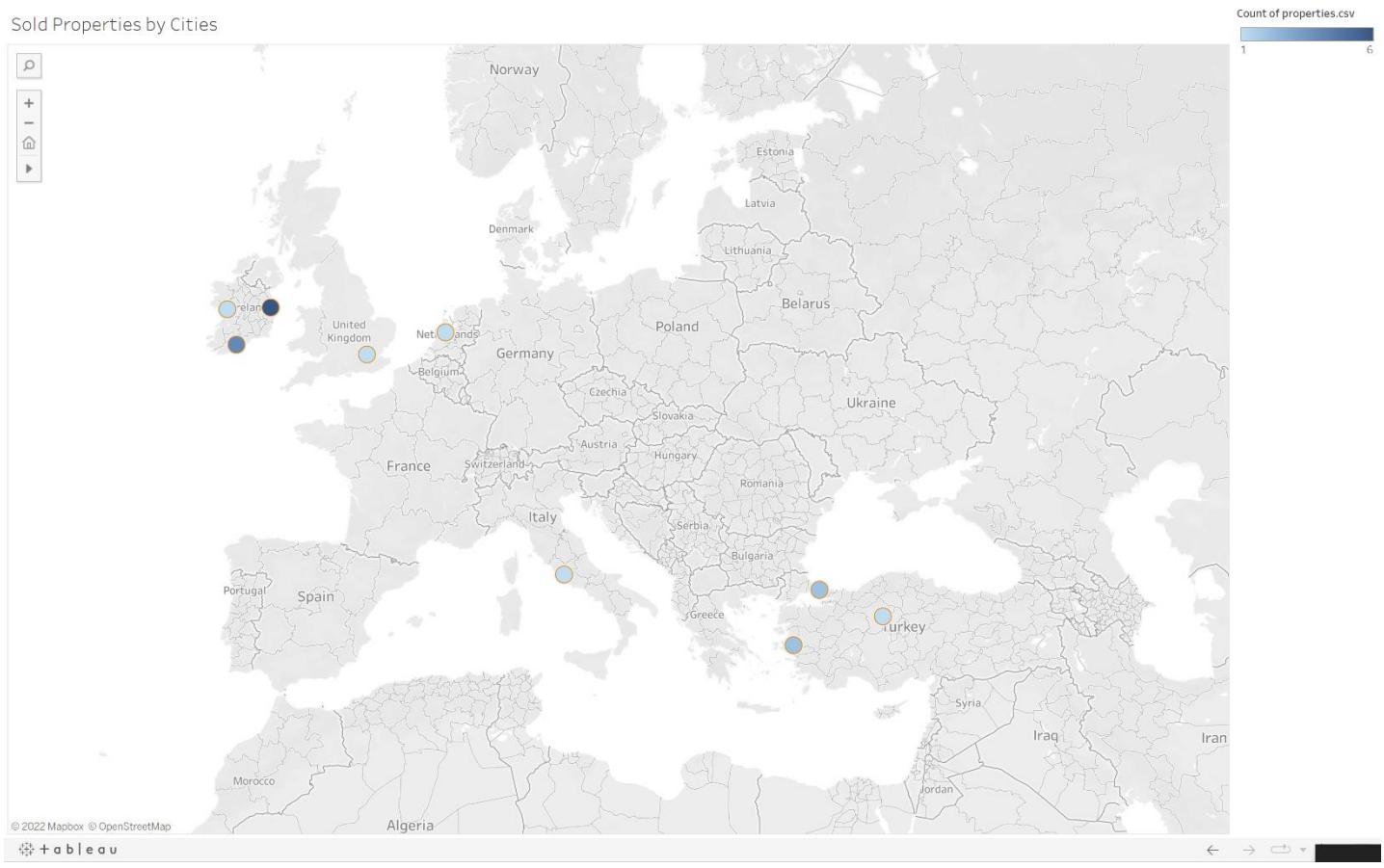


Average Price per City



Average Price per Area





Total Sales per year

