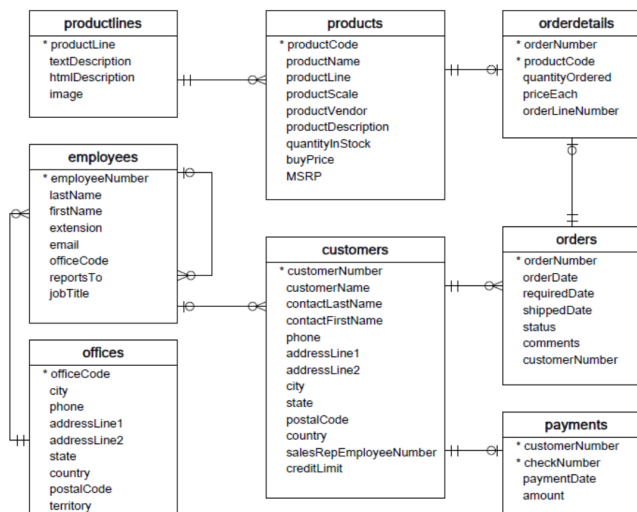# CRM Schema

In almost all cases, rather then just working with a single table we will typically need data from multiple tables. Doing this requires the use of **joins** using shared columns from the two tables. For example, here's a diagram of a mock customer relation management database.

Connecting to the Database

Import the necessary packages and connect to the database **data.sqlite**.

```
In [1]: import sqlite3
        import pandas as pd
```

```
In [2]: conn = sqlite3.connect('data.sqlite', detect_types=sqlite3.PARSE_COLNAMES)
        cur = conn.cursor()
```

Display the names of all the employees in Boston.

```
In [ ]: #Your code here
```

```
In [27]: cur.execute("""select firstName, lastName from employees join offices using(officeCode) where city = 'Boston';""")
         cur.fetchall()
```

```
Out[27]: [('Julie', 'Firrelli'), ('Steve', 'Patterson')]
```

Do any offices have no employees?

```
In [32]: cur.execute("""select city,
                              count(*)
                              from offices
                              left join employees
                              using(officeCode)
                              group by 1;""")
         df = pd.DataFrame(cur.fetchall())
         df.head()
```

Out[32]:

	0	1
0	Boston	2
1	London	2
2	NYC	2
3	Paris	5
4	San Francisco	6

```
In [34]: # No, but be sure to use a left join!!
```

Write 3 Questions of your own and answer them

```
In [ ]: # Answers will vary
```

```python
In [ ]:  # Your code here
```

```python
In [ ]:  # Your code here
```

```python
In [ ]:  # Your code here
```

Level Up: Display the names of each product each employee has sold.

```python
In [12]: cur.execute("""select firstName, lastName,
                               productName
                        from employees e
                        join
                        customers c
                        on e.employeeNumber = c.salesRepEmployeeNumber
                        join orders o
                        using(customerNumber)
                        join orderdetails od
                        using(orderNumber)
                        join products p
                        using(productCode)""")
         df = pd.DataFrame(cur.fetchall())
         print(len(df))
         df.head()
```

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Out[12]:

	0	1	2
0	Leslie	Jennings	1958 Setra Bus
1	Leslie	Jennings	1940 Ford Pickup Truck
2	Leslie	Jennings	1939 Cadillac Limousine
3	Leslie	Jennings	1996 Peterbilt 379 Stake Bed with Outrigger
4	Leslie	Jennings	1968 Ford Mustang

Level Up: Display the Number of Products each Employee Has sold

```python
In [13]: df.groupby([0,1]).count()
```

Out[13]:

0	1	2
Andy	Fixter	185
Barry	Jones	220
Foon Yue	Tseng	142
George	Vanauf	211
Gerard	Hernandez	396
Julie	Firrelli	124
Larry	Bott	236
Leslie	Jennings	331
Leslie	Thompson	114
Loui	Bondur	177
Mami	Nishi	137
Martin	Gerard	114
Pamela	Castillo	272
Peter	Marsh	185
Steve	Patterson	152