In [1]:
```python
import sqlite3
import pandas as pd
conn=sqlite3.connect('sqlite_db_pythonsqlite.db')
cur = conn.cursor()
```

In [2]:
```python
qry="select * from sqlite_master"
pd.read_sql(qry,conn)
```

Out[2]:

	type	name	tbl_name	rootpage	sql
0	table	Bookings	Bookings	2	CREATE TABLE "Bookings" (\n "bookid" int(4) N...
1	index	sqlite_autoindex_Bookings_1	Bookings	3	None
2	table	Facilities	Facilities	50	CREATE TABLE "Facilities" (\n "facid" int(1) ...
3	index	sqlite_autoindex_Facilities_1	Facilities	51	None
4	table	Members	Members	52	CREATE TABLE "Members" (\n "memid" int(2) NOT...
5	index	sqlite_autoindex_Members_1	Members	53	None

In [3]:
```python
#
df = pd.read_sql_query("SELECT * FROM Bookings ", conn)

# Print head of DataFrame
print(df.head(10))
```

```
   bookid  facid  memid            starttime  slots
0       0      3      1  2012-07-03 11:00:00      2
1       1      4      1  2012-07-03 08:00:00      2
2       2      6      0  2012-07-03 18:00:00      2
3       3      7      1  2012-07-03 19:00:00      2
4       4      8      1  2012-07-03 10:00:00      1
5       5      8      1  2012-07-03 15:00:00      1
6       6      0      2  2012-07-04 09:00:00      3
7       7      0      2  2012-07-04 15:00:00      3
8       8      4      3  2012-07-04 13:30:00      2
9       9      4      0  2012-07-04 15:00:00      2
```

In [4]:
```python
sum(df.slots)
```

Out[4]:
```
9191
```

Checking count of booking instances for members only by facility id

In [5]:
```python
queryx='''
select f.facid,count(b.facid) as counts from Bookings as b  inner join Facilities as f on
where b.memid!=0
group by f.facid
'''
df1=pd.read_sql_query(queryx,conn)
print(df1)
```

```
   facid  counts
0      0     308
1      1     276
2      2     344
3      3     385
```

```
4       4      421
5       5       27
6       6      195
7       7      421
8       8      783
```

In [6]:

```
print('count of booking instances for members only:',sum(df1.counts))
```

```
count of booking instances for members only: 3160
```

In [7]:

```
df2 = pd.read_sql_query("SELECT * FROM Facilities ", conn)
# Print head of DataFrame
print(df2.head())
```

```
   facid             name  membercost  guestcost  initialoutlay  \
0      0   Tennis Court 1         5.0       25.0          10000
1      1   Tennis Court 2         5.0       25.0           8000
2      2  Badminton Court         0.0       15.5           4000
3      3     Table Tennis         0.0        5.0            320
4      4   Massage Room 1         9.9       80.0           4000

   monthlymaintenance
0                 200
1                 200
2                  50
3                  10
4                3000
```

In [8]:

```
df3 = pd.read_sql_query("select * from Members ", conn)
# Print head of DataFrame
print(df3.head())
```

```
   memid   surname firstname                       address  zipcode  \
0      0     GUEST     GUEST                         GUEST        0
1      1     Smith    Darren     8 Bloomsbury Close, Boston     4321
2      2     Smith     Tracy  8 Bloomsbury Close, New York     4321
3      3    Rownam       Tim        23 Highway Way, Boston    23423
4      4  Joplette    Janice      20 Crossing Road, New York     234

        telephone recommendedby             joindate
0  (000) 000-0000               2012-07-01 00:00:00
1    555-555-5555               2012-07-02 12:02:05
2    555-555-5555               2012-07-02 12:08:23
3  (844) 693-0723               2012-07-03 09:32:15
4  (833) 942-4710             1 2012-07-03 10:25:05
```

/* Q10: Produce a list of facilities with a total revenue less than 1000.

The output of facility name and total revenue, sorted by revenue. Remember

that there's a different cost for guests and members! */

In [9]:

```
q='''
SELECT query.facility,SUM(cost) as revenue
FROM (SELECT f.name AS facility,
        CASE WHEN b.memid=0 THEN f.guestcost* b.slots ELSE f.membercost* b.slots END AS co
FROM Bookings AS b INNER JOIN Facilities AS f ON b.facid=f.facid) AS query
GROUP BY query.facility
HAVING revenue<1000
ORDER BY revenue
```

```
'''
pd.read_sql_query(q,conn)
```

Out[9]:

	facility	revenue
0	Table Tennis	180
1	Snooker Table	240
2	Pool Table	270

/ Q11: Produce a report of members and who recommended them in alphabetic surname,firstname order /

In [10]:

```
q1='''
select m.firstname || ',' || m.surname as member,q.firstname || ',' || q.surname as recomm
from Members as m inner join Members as q on q.memid=m.recommendedby
where q.memid!=0 and q.recommendedby is not null
order by q.surname,q.firstname

'''
pd.read_sql_query(q1,conn)
```

Out[10]:

	member	recommender
0	Ramnaresh,Sarwin	Florence,Bader
1	Joan,Coplin	Timothy,Baker
2	Matthew,Genting	Gerald,Butters
3	Timothy,Baker	Jemima,Farrell
4	David,Pinker	Jemima,Farrell
5	Henrietta,Rumney	Matthew,Genting
6	Douglas,Jones	David,Jones
7	Nancy,Dare	Janice,Joplette
8	David,Jones	Janice,Joplette
9	John,Hunt	Millicent,Purview
10	Tim,Boothe	Tim,Rownam
11	Janice,Joplette	Darren,Smith
12	Gerald,Butters	Darren,Smith
13	Charles,Owen	Darren,Smith
14	Jack,Smith	Darren,Smith
15	Anna,Mackenzie	Darren,Smith
16	Henry,Worthington-Smyth	Tracy,Smith
17	Millicent,Purview	Tracy,Smith
18	Erica,Crumpet	Tracy,Smith
19	Anne,Baker	Ponder,Stibbons
20	Florence,Bader	Ponder,Stibbons
21	Ponder,Stibbons	Burton,Tracy

/ Q12: Find the facilities with their usage by member, but not guests /

In [11]:
```
q2='''
select f.name as facility,sum(slots) as usage
from Bookings as b inner join Facilities as f on b.facid=f.facid
where b.memid !=0
group by facility
order by usage
'''
pd.read_sql_query(q2,conn)
```

Out[11]:

	facility	usage
0	Massage Room 2	54
1	Squash Court	418
2	Table Tennis	794
3	Pool Table	856
4	Snooker Table	860
5	Tennis Court 2	882
6	Massage Room 1	884
7	Tennis Court 1	957
8	Badminton Court	1086

/ Q13: Find the facilities usage by month, but not guests /

Scenariao 1 - Assuming facility usage means number of slots booked by members as total usage

In [12]:
```
q3='''
select f.name as facility,strftime('%m',b.starttime) as month,sum(b.slots) as usage
from Bookings as b  inner join Facilities as f on b.facid=f.facid
where b.memid!=0
group by facility,month
order by facility,month
'''
pd.read_sql_query(q3,conn)
```

Out[12]:

	facility	month	usage
0	Badminton Court	07	165
1	Badminton Court	08	414
2	Badminton Court	09	507
3	Massage Room 1	07	166
4	Massage Room 1	08	316
5	Massage Room 1	09	402
6	Massage Room 2	07	8
7	Massage Room 2	08	18
8	Massage Room 2	09	28

	facility	month	usage
9	Pool Table	07	110
10	Pool Table	08	303
11	Pool Table	09	443
12	Snooker Table	07	140
13	Snooker Table	08	316
14	Snooker Table	09	404
15	Squash Court	07	50
16	Squash Court	08	184
17	Squash Court	09	184
18	Table Tennis	07	98
19	Table Tennis	08	296
20	Table Tennis	09	400
21	Tennis Court 1	07	201
22	Tennis Court 1	08	339
23	Tennis Court 1	09	417
24	Tennis Court 2	07	123
25	Tennis Court 2	08	345
26	Tennis Court 2	09	414

Q.13 Scenario-2 Instead of slots used by members we want to know number of times members booked facilities (excluding guests)

Approach 1- Grouping by only month only(Not the facility)

May be incorrect as it will select only first 3 facilities and count by month (counting all facilities used in a particular month, rather than counting individual facilities)

In [16]:

```
q4 = '''SELECT
                name,
                strftime('%m', starttime) AS use_month,
                COUNT(name) AS member_use_count
            FROM Bookings AS b
            LEFT JOIN Facilities AS f
                USING(facid)
            WHERE b.memid > 0
            GROUP BY use_month'''

df4 = pd.read_sql_query(q4, conn)
df4.head(10)
```

Out[16]:

	name	use_month	member_use_count
0	Table Tennis	07	480
1	Tennis Court 1	08	1168
2	Tennis Court 1	09	1512

In [17]:
```
sum(df4.member_use_count)
```

Out[17]:
```
3160
```

Approach 2- Grouping by both month and facilities only.

still excluding guests booking and counting all facilities used by members for each individual bookings not considering slots

In [19]:
```
q5 = '''SELECT
                name,
                strftime('%m', starttime) AS use_month,
                COUNT(name) AS member_use_count
            FROM Bookings AS b
            INNER JOIN Facilities AS f
                USING(facid)
            WHERE b.memid > 0
            GROUP BY use_month,name
            order by use_month,name'''

df5=pd.read_sql_query(q5, conn)
print(df5)
```

```
               name use_month  member_use_count
0   Badminton Court        07                51
1    Massage Room 1        07                77
2    Massage Room 2        07                 4
3        Pool Table        07               103
4     Snooker Table        07                68
5      Squash Court        07                23
6      Table Tennis        07                48
7    Tennis Court 1        07                65
8    Tennis Court 2        07                41
9   Badminton Court        08               132
10   Massage Room 1        08               153
11   Massage Room 2        08                 9
12       Pool Table        08               272
13    Snooker Table        08               154
14     Squash Court        08                85
15     Table Tennis        08               143
16   Tennis Court 1        08               111
17   Tennis Court 2        08               109
18  Badminton Court        09               161
19   Massage Room 1        09               191
20   Massage Room 2        09                14
21       Pool Table        09               408
22    Snooker Table        09               199
23     Squash Court        09                87
24     Table Tennis        09               194
25   Tennis Court 1        09               132
26   Tennis Court 2        09               126
```

In [20]:
```
sum(df5.member_use_count)
```

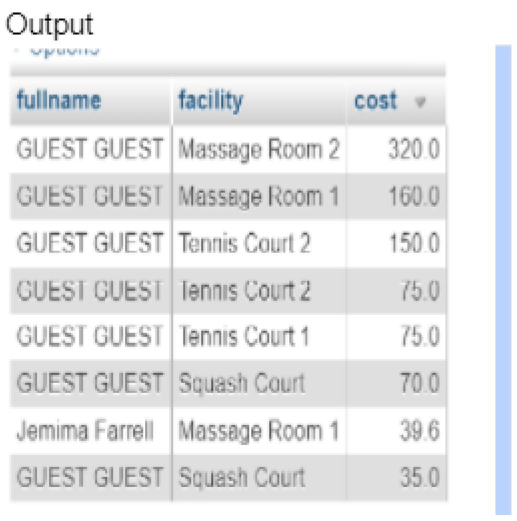
Out[20]:
```
3160
```

Since total count is same in both cases (approach 1 and 2) at 3160, approach 2 is more likely to be correct as it is showing all facilites usage unlike approach 1 which is only showing 3 facilities

Q8: Produce a list of bookings on the day of 2012-09-14 which will cost the member (or guest) more than

$30. Remember that guests have different costs to members (the listed costs are per half-hour 'slot'), and the guest user's ID is always 0. Include in your output the name of the facility, the name of the member formatted as a single column, and the cost. Order by descending cost, and do not use any subqueries. */

Output of question 8 in PHP My Admin



Output

fullname	facility	cost
GUEST GUEST	Massage Room 2	320.0
GUEST GUEST	Massage Room 1	160.0
GUEST GUEST	Tennis Court 2	150.0
GUEST GUEST	Tennis Court 2	75.0
GUEST GUEST	Tennis Court 1	75.0
GUEST GUEST	Squash Court	70.0
Jemima Farrell	Massage Room 1	39.6
GUEST GUEST	Squash Court	35.0

/ Q9: This time, produce the same result as in Q8, but using a subquery. /

In [34]:
```
q6='''
select distinct s.facilityname,s.lastname || ',' || s.first as fullname,s.cost
    from(select f.name as facilityname,m.surname as lastname,m.firstname as first,case whe
        from Bookings as b inner join Facilities as f on b.facid=f.facid inner join Membe
        where starttime like '2012-09-14%'
        and (case when b.memid!=0 then b.slots*f.membercost else b.slots*f.guestcost end)>
    order by cost desc
'''
pd.read_sql_query(q6, conn)
```

Out[34]:
```
     facilityname        fullname   cost
0  Massage Room 2     GUEST,GUEST  320.0
1  Massage Room 1     GUEST,GUEST  160.0
2   Tennis Court 2    GUEST,GUEST  150.0
3   Tennis Court 1    GUEST,GUEST   75.0
4   Tennis Court 2    GUEST,GUEST   75.0
5     Squash Court    GUEST,GUEST   70.0
6  Massage Room 1  Farrell,Jemima   39.6
7     Squash Court    GUEST,GUEST   35.0
```

In [ ]: