

# Aggregation

## 1.Count the number of facilities

**Query:** select count(\*) from cd.facilities;

### SQLOUTPUT:

```
exercises=#  
exercises=# select count(*) from cd.facilities;  
count  
-----  
      11  
(1 row)
```

## 2.Count the number of expensive facilities

**Query:** select count(\*) from cd.facilities where guestcost >= 10;

### SQLOUTPUT:

```
exercises=# select count(*) from cd.facilities where guestcost >= 10;  
count  
-----  
      8  
(1 row)
```

## 3.Count the number of recommendations each member makes.

**Query:** select recommendedby, count(\*) from cd.members

where recommendedby

is not null group by recommendedby

order by recommendedby;

## SQLOUTPUT:

```
exercises=# select recommendedby, count(*) from cd.members
exercises-# where recommendedby
exercises-# is not null group by recommendedby
exercises-# order by recommendedby;
recommendedby | count
-----+-----
1 | 5
2 | 3
3 | 1
4 | 2
5 | 1
6 | 1
9 | 2
11 | 1
13 | 2
15 | 1
16 | 1
20 | 1
30 | 1
(13 rows)
```

## 4.List the total slots booked per facility

**Query:** select facid, sum(slots) as "Total Slots"

from cd.bookings

group by facid

order by facid;

## SQLOUTPUT:

```
exercises=# select facid, sum(slots) as "Total Slots"
exercises-# from cd.bookings
exercises-# group by facid
exercises-# order by facid;
facid | Total Slots
-----+-----
0 | 1320
1 | 1278
2 | 1209
3 | 830
4 | 1404
5 | 228
6 | 1104
7 | 908
8 | 911
(9 rows)
```

## 5. List the total slots booked per facility in a given month

**Query:** select facid, sum(slots) as "Total Slots" from cd.bookings where starttime >= '2012-09-01' and starttime < '2012-10-01' group by facid order by sum(slots);

### SQLOUTPUT:

```
exercises=# select facid, sum(slots) as "Total Slots" from cd.bookings where starttime >= '2012-09-01' and starttime < '2012-10-01' group by facid order by sum(slots);
 facid | Total Slots
-----|-----
      5 |         122
      3 |         422
      7 |         426
      8 |         471
      6 |         540
      2 |         570
      1 |         588
      0 |         591
      4 |         648
(9 rows)
```

## 6. List the total slots booked per facility per month

**Query:** select facid, extract(month from starttime) as month, sum(slots) as "Total Slots" from cd.bookings where extract(year from starttime) = 2012 group by facid, month order by facid, month;

### SQLOUTPUT:

```
exercises=# select facid, extract(month from starttime) as month, sum(slots) as "Total Slots" from cd.bookings where extract(year from starttime) = 2012 group by facid, month order by facid, month;
 facid | month | Total Slots
-----|-----|-----
      0 |      7 |         270
      0 |      8 |         459
      0 |      9 |         591
      1 |      7 |         207
      1 |      8 |         483
      1 |      9 |         588
      2 |      7 |         180
      2 |      8 |         459
      2 |      9 |         570
      3 |      7 |         104
      3 |      8 |         304
      3 |      9 |         422
      4 |      7 |         264
      4 |      8 |         492
      4 |      9 |         648
      5 |      7 |          24
      5 |      8 |          82
      5 |      9 |         122
      6 |      7 |         164
      6 |      8 |         400
      6 |      9 |         540
      7 |      7 |         156
      7 |      8 |         320
      7 |      9 |         426
      8 |      7 |         117
      8 |      8 |         322
      8 |      9 |         471
(27 rows)
```

## 7. Find the count of members who have made at least one booking

**Query:** select count(\*) from  
(select distinct memid from cd.bookings) as mems;

## SQLOUTPUT:

```
exercises=# select count(*) from
exercises=# (select distinct memid from cd.bookings) as mems
exercises=# ;
count
-----
      30
(1 row)
```

## 8.List facilities with more than 1000 slots booked

**Query:** select facid, sum(slots) as "Total Slots" from cd.bookings group by facid having sum(slots) > 1000 order by facid;

## SQLOUTPUT:

```
exercises=# select facid, sum(slots) as "Total Slots" from cd.bookings group by facid having sum(slots) > 1000 order by facid;
 facid | Total Slots
-----+-----
      0 |      1320
      1 |      1278
      2 |      1209
      4 |      1404
      6 |      1104
(5 rows)
```

## 9.Find the total revenue of each facility

**Query:** select facs.name, sum(slots \* case when memid = 0 then facs.guestcost else facs.membercost end) as revenue from cd.bookings bks inner join cd.facilities facs on bks.facid = facs.facid group by facs.name order by revenue;

## SQLOUTPUT:

```
exercises=# select facs.name, sum(slots * case when memid = 0 then facs.guestcost else facs.membercost end) as revenue from cd.bookings bks inner join cd.facilities facs on bks.facid = facs.facid group by facs.name order by revenue;
name | revenue
-----+-----
Table Tennis | 180
Snooker Table | 240
Pool Table | 270
Badminton Court | 1906.5
Squash Court | 13468.0
Tennis Court 1 | 13860
Tennis Court 2 | 14310
Massage Room 2 | 15810
Massage Room 1 | 72540
(9 rows)
```

## 10.Find facilities with a total revenue less than 1000

**Query:** select name, revenue from ( select facs.name, sum(case when memid = 0 then slots \* facs.guestcost else slots \* membercost end) as revenue from cd.bookings bks inner join cd.facilities facs on bks.facid = facs.facid group by facs.name ) as agg where revenue < 1000 order by revenue;

## SQLOUTPUT:

```
exercises=# select name, revenue from ( select facs.name, sum(case when memid = 0 then slots * facs.guestcost else slots * membercost end) as revenue from cd.bookings bks inner
join cd.facilities facs on bks.facid = facs.facid group by facs.name ) as agg where revenue < 1000 order by revenue;
 name      | revenue 
-----+-----
Table Tennis |    180
Snooker Table |    240
Pool Table  |    270
(3 rows)
```

## 11. Output the facility id that has the highest number of slots booked

**Query:** select facid, sum(slots) as "Total Slots" from cd.bookings group by facid order by sum(slots) desc LIMIT 1;

## SQLOUTPUT:

```
exercises=# select facid, sum(slots) as "Total Slots" from cd.bookings group by facid order by sum(slots) desc LIMIT 1;
 facid | Total Slots 
-----+-----
      4 |         1404
(1 row)
```

## 12. List the total slots booked per facility per month, part 2

**Query:** select facid, extract(month from starttime) as month, sum(slots) as slots from cd.bookings where starttime >= '2012-01-01' and starttime < '2013-01-01' group by facid, month union all select facid, null, sum(slots) as slots from cd.bookings where starttime >= '2012-01-01' and starttime < '2013-01-01' group by facid union all select null, null, sum(slots) as slots from cd.bookings where starttime >= '2012-01-01' and starttime < '2013-01-01' order by facid, month;

## SQLOUTPUT:

```
exercises=# select facid, extract(month from starttime) as month, sum(slots) as slots from cd.bookings where starttime >= '2012-01-01' and starttime < '2013-01-01' group by facid, month union all select facid, null, sum(slots) as slots from cd.bookings where starttime >= '2012-01-01' and starttime < '2013-01-01' group by facid union all select null, null, sum(slots) as slots from cd.bookings where starttime >= '2012-01-01' and starttime < '2013-01-01' order by facid, month;
 facid | month | slots
-----+-----+-----
 0     | 7     | 270
 0     | 8     | 459
 0     | 9     | 591
 0     |      | 1320
 1     | 7     | 207
 1     | 8     | 483
 1     | 9     | 588
 1     |      | 1278
 2     | 7     | 180
 2     | 8     | 459
 2     | 9     | 570
 2     |      | 1209
 3     | 7     | 104
 3     | 8     | 304
 3     | 9     | 422
 3     |      | 830
 4     | 7     | 264
 4     | 8     | 492
 4     | 9     | 648
 4     |      | 1404
 5     | 7     | 24
 5     | 8     | 82
 5     | 9     | 122
 5     |      | 228
 6     | 7     | 164
 6     | 8     | 400
 6     | 9     | 540
 6     |      | 1104
 7     | 7     | 156
 7     | 8     | 326
 7     | 9     | 426
 7     |      | 908
 8     | 7     | 117
 8     | 8     | 322
 8     | 9     | 471
 8     |      | 910
      |      | 9191
(37 rows)
```

### 13. List the total hours booked per named facility

**Query:** select facs.facid, facs.name, trim(to\_char(sum(bks.slots)/2.0, '9999999999999999D99')) as "Total Hours" from cd.bookings bks inner join cd.facilities facs on facs.facid = bks.facid group by facs.facid, facs.name order by facs.facid;

## SQLOUTPUT:

```
exercises=# select facs.facid, facs.name, trim(to_char(sum(bks.slots)/2.0, '9999999999999999D99')) as "Total Hours" from cd.bookings bks inner join cd.facilities facs on facs.facid = bks.facid group by facs.facid, facs.name order by facs.facid;
 facid | name          | Total Hours
-----+-----+-----
 0     | Tennis Court 1 | 660.00
 1     | Tennis Court 2 | 639.00
 2     | Badminton Court | 604.50
 3     | Table Tennis   | 415.00
 4     | Massage Room 1 | 702.00
 5     | Massage Room 2 | 114.00
 6     | Squash Court   | 552.00
 7     | Snooker Table  | 454.00
 8     | Pool Table     | 455.50
(9 rows)
```

### 14. List each member's first booking after September 1st 2012

**Query:** select mems.surname, mems.firstname, mems.memid, min(bks.starttime) as starttime from cd.bookings bks inner join cd.members mems on mems.memid = bks.memid where starttime >= '2012-09-01' group by mems.surname, mems.firstname, mems.memid order by mems.memid;

## SQLOUTPUT:

```
exercises=# select mems.surname, mems.firstname, mems.memid, min(bks.starttime) as starttime from cd.bookings bks inner join cd.members mems on mems.memid = bks.memid where starttime >= '2012-09-01' group by mems.surname, mems.firstname, mems.memid order by mems.memid;
```

surname	firstname	memid	starttime
GUEST	GUEST	0	2012-09-01 08:00:00
Smith	Darren	1	2012-09-01 09:00:00
Smith	Tracy	2	2012-09-01 11:30:00
Rownam	Tim	3	2012-09-01 16:00:00
Joplette	Janice	4	2012-09-01 15:00:00
Butters	Gerald	5	2012-09-02 12:30:00
Tracy	Burton	6	2012-09-01 15:00:00
Dare	Nancy	7	2012-09-01 12:30:00
Boothe	Tim	8	2012-09-01 08:30:00
Stibbons	Ponder	9	2012-09-01 11:00:00
Owen	Charles	10	2012-09-01 11:00:00
Jones	David	11	2012-09-01 09:30:00
Baker	Anne	12	2012-09-01 14:30:00
Farrell	Jemima	13	2012-09-01 09:30:00
Smith	Jack	14	2012-09-01 11:00:00
Bader	Florence	15	2012-09-01 18:30:00
Baker	Timothy	16	2012-09-01 15:00:00
Pinker	David	17	2012-09-01 08:30:00
Genting	Matthew	20	2012-09-01 18:00:00
Mackenzie	Anna	21	2012-09-01 08:30:00
Coplin	Joan	22	2012-09-02 11:30:00
Sarwin	Ramnaresh	24	2012-09-04 11:00:00
Jones	Douglas	26	2012-09-08 13:00:00
Rumney	Henrietta	27	2012-09-16 13:30:00
Farrell	David	28	2012-09-18 09:00:00
Worthington-Smyth	Henry	29	2012-09-19 09:30:00
Purview	Millicent	30	2012-09-19 11:30:00
Tupperware	Hyacinth	33	2012-09-20 08:00:00
Hunt	John	35	2012-09-23 14:00:00
Crumpet	Erica	36	2012-09-27 11:30:00

(30 rows)

**15. Produce a list of member names, with each row containing the total member count**

**Query:** select (select count(\*) from cd.members) as count, firstname, surname from cd.members order by joindate;

## SQLOUTPUT:

```
exercises=# select (select count(*) from cd.members) as count, firstname, surname from cd.members order by joindate;
```

count	firstname	surname
31	GUEST	GUEST
31	Darren	Smith
31	Tracy	Smith
31	Tim	Rownam
31	Janice	Joplette
31	Gerald	Butters
31	Burton	Tracy
31	Nancy	Dare
31	Tim	Boothe
31	Ponder	Stibbons
31	Charles	Owen
31	David	Jones
31	Anne	Baker
31	Jemima	Farrell
31	Jack	Smith
31	Florence	Bader
31	Timothy	Baker
31	David	Pinker
31	Matthew	Genting
31	Anna	Mackenzie
31	Joan	Coplin
31	Ramnaresh	Sarwin
31	Douglas	Jones
31	Henrietta	Rumney
31	David	Farrell
31	Henry	Worthington-Smyth
31	Millicent	Purview
31	Hyacinth	Tupperware
31	John	Hunt
31	Erica	Crumpet
31	Darren	Smith

(31 rows)

**16. Produce a numbered list of members**

**Query:** select row\_number() over(order by joindate), firstname, surname from cd.members order by joindate;

## SQLOUTPUT:

```
exercises=# select row_number() over(order by joindate), firstname, surname from cd.members order by joindate;
```

row_number	firstname	surname
1	GUEST	GUEST
2	Darren	Smith
3	Tracy	Smith
4	Tim	Rownam
5	Janice	Joplette
6	Gerald	Butters
7	Burton	Tracy
8	Nancy	Dare
9	Tim	Boothe
10	Ponder	Stibbons
11	Charles	Owen
12	David	Jones
13	Anne	Baker
14	Jemima	Farrell
15	Jack	Smith
16	Florence	Bader
17	Timothy	Baker
18	David	Pinker
19	Matthew	Genting
20	Anna	Mackenzie
21	Joan	Coplin
22	Ramnaresh	Sarwin
23	Douglas	Jones
24	Henrietta	Rumney
25	David	Farrell
26	Henry	Worthington-Smyth
27	Millicent	Purview
28	Hyacinth	Tupperware
29	John	Hunt
30	Erica	Crumpet
31	Darren	Smith

(31 rows)

## 17. Output the facility id that has the highest number of slots booked, again

### Query:

select facid, sum(slots) as totalslots from cd.bookings group by facid having sum(slots) = (select max(sum2.totalslots) from (select sum(slots) as totalslots from cd.bookings group by facid ) as sum2);

## SQLOUTPUT:

```
exercises=# select facid, sum(slots) as totalslots from cd.bookings group by facid having sum(slots) = (select max(sum2.totalslots) from (select sum(slots) as totalslots from cd
.bookings group by facid ) as sum2);
```

facid	totalslots
4	1404

(1 row)

## 18. Rank members by (rounded) hours used

**Query:** select firstname, surname, hours, rank() over (order by hours desc) from (select firstname, surname, ((sum(bks.slots)+10)/20)\*10 as hours from cd.bookings bks inner join cd.members mems on bks.memid = mems.memid group by mems.memid ) as subq order by rank, surname, firstname;



## SQLOUTPUT:

```
exercises=# select firstname, surname, hours, rank() over (order by hours desc) from (select firstname, surname, ((sum(bks.slots)+10)/20)*10 as hours from cd.bookings bks inner
join cd.members mems on bks.memid = mems.memid group by mems.memid ) as subq order by rank, surname, firstname;
-----
firstname | surname | hours | rank
-----
GUEST | | 1200 | 1
Darren | Smith | 340 | 2
Tim | Rownam | 330 | 3
Tim | Boothe | 220 | 4
Tracy | Smith | 220 | 4
Gerald | Butters | 210 | 6
Burton | Tracy | 180 | 7
Charles | Owen | 170 | 8
Janice | Joplette | 160 | 9
Anne | Baker | 150 | 10
Timothy | Baker | 150 | 10
David | Jones | 150 | 10
Nancy | Dare | 130 | 13
Florence | Bader | 120 | 14
Anna | Mackenzie | 120 | 14
Ponder | Stibbons | 120 | 14
Jack | Smith | 110 | 17
Jemima | Farrell | 90 | 18
David | Pinker | 80 | 19
Ramnaresh | Sarwin | 80 | 19
Matthew | Gentling | 70 | 21
Joan | Coplin | 50 | 22
David | Farrell | 30 | 23
Henry | Worthington-Smyth | 30 | 23
John | Hunt | 20 | 25
Douglas | Jones | 20 | 25
Millicent | Purview | 20 | 25
Henrietta | Rummy | 20 | 25
Erica | Crumpet | 10 | 29
Hyacinth | Tupperware | 10 | 29
(30 rows)
```

## 19.Find the top three revenue generating facilities

**Query:** select name, rank from ( select facs.name as name, rank() over (order by sum(case when memid = 0 then slots \* facs.guestcost else slots \* membercost end) desc) as rank from cd.bookings bks inner join cd.facilities facs on bks.facid = facs.facid group by facs.name ) as subq where rank <= 3 order by rank;

## SQLOUTPUT:

```
exercises=# select name, rank from ( select facs.name as name, rank() over (order by sum(case when memid = 0 then slots * facs.guestcost else slots * membercost end) desc) as r
ank from cd.bookings bks inner join cd.facilities facs on bks.facid = facs.facid group by facs.name ) as subq where rank <= 3 order by rank;
-----
name | rank
-----
Message Room 1 | 1
Message Room 2 | 2
Tennis Court 2 | 3
(3 rows)
```

## 20.Classify facilities by value

**Query:** select name, case when class=1 then 'high' when class=2 then 'average' else 'low' end revenue from ( select facs.name as name, ntile(3) over (order by sum(case when memid = 0 then slots \* facs.guestcost else slots \* membercost end) desc) as class from cd.bookings bks inner join cd.facilities facs on bks.facid = facs.facid group by facs.name ) as subq order by class, name;

## SQLOUTPUT:

```

exercises=# select name, case when class=1 then 'high' when class=2 then 'average' else 'low' end revenue from ( select facs.name as name, ntile(3) over (order by sum(case when
memid = 0 then slots * facs.guestcost else slots * membercost end) desc) as class from cd.bookings bks inner join cd.facilities facs on bks.facid = facs.facid group by facs.name
) as subq order by class, name;

```

name	revenue
Message Room 1	high
Message Room 2	high
Tennis Court 2	high
Badminton Court	average
Squash Court	average
Tennis Court 1	average
Pool Table	low
Snooker Table	low
Table Tennis	low

(9 rows)

## 21. Calculate the payback time for each facility

**Query:** select name, initialoutlay / (monthlyrevenue - monthlymaintenance) as repaytime from (select facs.name as name, facs.initialoutlay as initialoutlay, facs.monthlymaintenance as monthlymaintenance, sum(case when memid = 0 then slots \* facs.guestcost else slots \* membercost end)/3 as monthlyrevenue from cd.bookings bks inner join cd.facilities facs on bks.facid = facs.facid group by facs.facid ) as subq order by name;

### SQLOUTPUT:

```

exercises=# select name, initialoutlay / (monthlyrevenue - monthlymaintenance) as repaytime from (select facs.name as name, facs.initialoutlay as initialoutlay, facs.monthlymain
tenance as monthlymaintenance, sum(case when memid = 0 then slots * facs.guestcost else slots * membercost end)/3 as monthlyrevenue from cd.bookings bks inner join cd.facilities
facs on bks.facid = facs.facid group by facs.facid ) as subq order by name;

```

name	repaytime
Badminton Court	6.8317677198975235
Message Room 1	0.18885741265344664778
Message Room 2	1.7621145374449339
Pool Table	5.333333333333333
Snooker Table	6.923076923076923
Squash Court	1.1339582703356516
Table Tennis	6.400000000000000
Tennis Court 1	2.2624434389140271
Tennis Court 2	1.7585470459518600

(9 rows)

## 22. Calculate a rolling average of total revenue

**Query:** select dategen.date, ( -- correlated subquery that, for each day fed into it, -- finds the average revenue for the last 15 days

select sum(case when memid = 0 then slots \* facs.guestcost else slots \* membercost end)

as rev from cd.bookings bks inner join cd.facilities facs on bks.facid = facs.facid where bks.starttime > dategen.date - interval '14 days' and bks.starttime < dategen.date + interval '1 day' )/15 as revenue

from ( -- generates a list of days in august select cast(generate\_series(timestamp '2012-08-01', '2012-08-31', '1 day') as date) as date ) as dategen order by dategen.date;

## SQLOUTPUT:

```
exercises=# select dategen.date,
exercises-# (
exercises(# -- correlated subquery that, for each day fed into it,
exercises(# -- finds the average revenue for the last 15 days
exercises(# select sum(case
exercises(# when memid = 0 then slots * facs.guestcost
exercises(# else slots * membercost
exercises(# end) as rev
exercises(#
exercises(# from cd.bookings bks
exercises(# inner join cd.facilities facs
exercises(# on bks.facid = facs.facid
exercises(# where bks.starttime > dategen.date - interval '14 days'
exercises(# and bks.starttime < dategen.date + interval '1 day'
exercises(# )/15 as revenue
exercises-# from
exercises-# (
exercises(# -- generates a list of days in august
exercises(# select cast(generate_series(timestamp '2012-08-01',
exercises(# '2012-08-31','1 day') as date) as date
exercises(# ) as dategen
exercises-# order by dategen.date;
   date | revenue
-----+-----
2012-08-01 | 1126.8333333333333
2012-08-02 | 1153.0000000000000
2012-08-03 | 1162.9000000000000
2012-08-04 | 1177.3666666666667
2012-08-05 | 1160.9333333333333
2012-08-06 | 1185.4000000000000
2012-08-07 | 1182.8666666666667
2012-08-08 | 1172.6000000000000
2012-08-09 | 1152.4666666666667
2012-08-10 | 1175.0333333333333
2012-08-11 | 1176.6333333333333
2012-08-12 | 1195.6666666666667
2012-08-13 | 1218.0000000000000
2012-08-14 | 1247.4666666666667
2012-08-15 | 1274.1000000000000
2012-08-16 | 1281.2333333333333
2012-08-17 | 1324.4666666666667
2012-08-18 | 1373.7333333333333
2012-08-19 | 1406.0666666666667
2012-08-20 | 1427.0666666666667
2012-08-21 | 1450.3333333333333
2012-08-22 | 1539.7000000000000
2012-08-23 | 1567.3000000000000
```

```

exercises(# end) as rev
exercises(#
exercises(# from cd.bookings bks
exercises(# inner join cd.facilities facs
exercises(# on bks.facid = facs.facid
exercises(# where bks.starttime > dategen.date - interval '14 days'
exercises(# and bks.starttime < dategen.date + interval '1 day'
exercises(# )/15 as revenue
exercises-# from
exercises-# (
exercises(# -- generates a list of days in august
exercises(# select cast(generate_series(timestamp '2012-08-01',
exercises(# '2012-08-31','1 day') as date) as date
exercises(# ) as dategen
exercises-# order by dategen.date;

```

date	revenue
2012-08-01	1126.8333333333333
2012-08-02	1153.0000000000000
2012-08-03	1162.9000000000000
2012-08-04	1177.3666666666667
2012-08-05	1160.9333333333333
2012-08-06	1185.4000000000000
2012-08-07	1182.8666666666667
2012-08-08	1172.6000000000000
2012-08-09	1152.4666666666667
2012-08-10	1175.0333333333333
2012-08-11	1176.6333333333333
2012-08-12	1195.6666666666667
2012-08-13	1218.0000000000000
2012-08-14	1247.4666666666667
2012-08-15	1274.1000000000000
2012-08-16	1281.2333333333333
2012-08-17	1324.4666666666667
2012-08-18	1373.7333333333333
2012-08-19	1406.0666666666667
2012-08-20	1427.0666666666667
2012-08-21	1450.3333333333333
2012-08-22	1539.7000000000000
2012-08-23	1567.3000000000000
2012-08-24	1592.3333333333333
2012-08-25	1615.0333333333333
2012-08-26	1631.2000000000000
2012-08-27	1659.4333333333333
2012-08-28	1687.0000000000000
2012-08-29	1684.6333333333333
2012-08-30	1657.9333333333333
2012-08-31	1703.4000000000000

(31 rows)