



Queries on Cash Database

Group 3

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Exercise 86: calculate the 3-months moving average of reservation counts

-- temporary view

with reservation_data as (

Select

extract (year from (interval).begints) as reservation_year,

extract (month from (interval).begints) as reservation_month,

count(*) as count_num

from cash.reservation

group by reservation_year, reservation_month)

-- analytic query

Select reservation_year,reservation_month,count_num,

avg(count_num) over (partition by reservation_year

order by reservation_month

rows between 1 preceding and 1 following) as moving_average

from reservation_data

| | reservation_year numeric | reservation_month numeric | count_num bigint | moving_average numeric |
|----|-----------------------------|------------------------------|---------------------|---------------------------|
| 1 | 2023 | 6 | 2 | 30.0000000000000000 |
| 2 | 2023 | 7 | 58 | 78.0000000000000000 |
| 3 | 2023 | 8 | 174 | 138.0000000000000000 |
| 4 | 2023 | 9 | 182 | 179.6666666666666667 |
| 5 | 2023 | 10 | 183 | 181.6666666666666667 |
| 6 | 2023 | 11 | 180 | 179.0000000000000000 |
| 7 | 2023 | 12 | 174 | 177.0000000000000000 |
| 8 | 2024 | 1 | 183 | 180.5000000000000000 |
| 9 | 2024 | 2 | 178 | 176.6666666666666667 |
| 10 | 2024 | 3 | 169 | 176.0000000000000000 |
| 11 | 2024 | 4 | 181 | 175.3333333333333333 |
| 12 | 2024 | 5 | 176 | 180.3333333333333333 |
| 13 | 2024 | 6 | 184 | 168.6666666666666667 |
| 14 | 2024 | 7 | 146 | 113.0000000000000000 |
| 15 | 2024 | 8 | 9 | 52.0000000000000000 |
| 16 | 2024 | 9 | 1 | 5.0000000000000000 |



Exercise 87: calculate the cumulated sums of monthly reservation counts per year

-- temporary view

```
with reservation_data as (
  Select
  extract (year from (interval).begints) as reservation_year,
  extract (month from (interval).begints) as reservation_month,
  count(*) as count_num
  from cash.reservation
  group by reservation_year, reservation_month)
```

-- analytic query

```
Select reservation_year,reservation_month,count_num,
sum(count_num) over (partition by reservation_year
                    order by reservation_month) as cumulated_sum
from reservation_data
```

| | reservation_year numeric | reservation_month numeric | count_num bigint | cumulated_sum numeric |
|----|-----------------------------|------------------------------|---------------------|--------------------------|
| 1 | 2023 | 6 | 2 | 2 |
| 2 | 2023 | 7 | 58 | 60 |
| 3 | 2023 | 8 | 174 | 234 |
| 4 | 2023 | 9 | 182 | 416 |
| 5 | 2023 | 10 | 183 | 599 |
| 6 | 2023 | 11 | 180 | 779 |
| 7 | 2023 | 12 | 174 | 953 |
| 8 | 2024 | 1 | 183 | 183 |
| 9 | 2024 | 2 | 178 | 361 |
| 10 | 2024 | 3 | 169 | 530 |
| 11 | 2024 | 4 | 181 | 711 |
| 12 | 2024 | 5 | 176 | 887 |
| 13 | 2024 | 6 | 184 | 1071 |
| 14 | 2024 | 7 | 146 | 1217 |
| 15 | 2024 | 8 | 9 | 1226 |
| 16 | 2024 | 9 | 1 | 1227 |



Ranking of members by amount of reservations

```
SELECT m.id as member, count(r.id) as reservationCount, RANK() OVER (  
    ORDER BY count(r.id) DESC  
) rank  
FROM cash.member m  
JOIN cash.reservation r  
ON r.member = m.id  
GROUP BY m.id;
```

| | member integer | reservationcount bigint | rank bigint |
|----|-------------------|----------------------------|----------------|
| 1 | 1034 | 528 | 1 |
| 2 | 1008 | 492 | 2 |
| 3 | 1021 | 480 | 3 |
| 4 | 1009 | 476 | 4 |
| 5 | 1037 | 468 | 5 |
| 6 | 1032 | 432 | 6 |
| 7 | 1023 | 432 | 6 |
| 8 | 1024 | 384 | 8 |
| 9 | 1015 | 384 | 8 |
| 10 | 1012 | 384 | 8 |
| 11 | 1018 | 380 | 11 |
| 12 | 1013 | 336 | 12 |
| 13 | 1027 | 336 | 12 |
| 14 | 1028 | 336 | 12 |
| 15 | 1011 | 332 | 15 |
| 16 | 1016 | 292 | 16 |
| 17 | 1014 | 288 | 17 |
| 18 | 1035 | 288 | 17 |
| 19 | 1031 | 276 | 19 |
| 20 | 1019 | 264 | 20 |
| 21 | 1029 | 236 | 21 |
| 22 | 1025 | 224 | 22 |



Ranking of Vehicles by sum of reserved hours

```
WITH tempTable AS
(
  SELECT vehicle, (r.interval).endts - (r.interval).begints as time
  FROM cash.reservation r
)

SELECT vehicle, cast(extract(epoch from SUM(time)) / 3600 as int)
as "totalReservation (in hours)",
RANK() OVER (
  ORDER BY sum(time) DESC
) rank
FROM tempTable
GROUP BY vehicle;
```

| | |
|---|--|
| interval | |
| cash.interval | |
| ("2024-07-23 16:00:00","2024-07-23 21:00:00") | |

interval

General Definition Security SQL

Type Composite

Composite Type

| | Member Name | Type | Le |
|--|-------------|-----------------|----|
| | begints | timestam... v | |
| | endts | timestam... v | |

| | vehicle integer | totalReservation (in hours) integer | rank bigint |
|----|--------------------|--|----------------|
| 1 | 1000 | 4078 | 1 |
| 2 | 1036 | 3152 | 2 |
| 3 | 1035 | 2888 | 3 |
| 4 | 1031 | 2832 | 4 |
| 5 | 1041 | 2748 | 5 |
| 6 | 1040 | 2208 | 6 |
| 7 | 1026 | 1992 | 7 |
| 8 | 1038 | 1848 | 8 |
| 9 | 1012 | 1728 | 9 |
| 10 | 1029 | 1688 | 10 |
| 11 | 1042 | 1632 | 11 |
| 12 | 1025 | 1608 | 12 |
| 13 | 1007 | 1584 | 13 |
| 14 | 1037 | 1536 | 14 |
| 15 | 1039 | 1496 | 15 |
| 16 | 1032 | 1440 | 16 |
| 17 | 1019 | 1440 | 16 |
| 18 | 1013 | 1428 | 18 |
| 19 | 1028 | 1296 | 19 |
| 20 | 1018 | 1272 | 20 |



Ranking of Vehicles by sum of reserved hours Top 10

```
WITH tempTable AS (  
    SELECT vehicle, (r.interval).endts - (r.interval).begints as time  
    FROM cash.reservation r  
) , rankedVehicles AS (  
    SELECT vehicle, cast(extract(epoch from SUM(time)) / 3600 as int)  
    as "totalReservation (in hours)",  
    RANK() OVER (  
        ORDER BY SUM(time) DESC  
    ) rank  
    FROM tempTable  
    GROUP BY vehicle  
)  
  
SELECT vehicle, "totalReservation (in hours)", rank  
FROM rankedVehicles  
WHERE rank <= 10;
```

| | vehicle integer | totalReservation (in hours) integer | rank bigint |
|----|--------------------|--|----------------|
| 1 | 1000 | 4078 | 1 |
| 2 | 1036 | 3152 | 2 |
| 3 | 1035 | 2888 | 3 |
| 4 | 1031 | 2832 | 4 |
| 5 | 1041 | 2748 | 5 |
| 6 | 1040 | 2208 | 6 |
| 7 | 1026 | 1992 | 7 |
| 8 | 1038 | 1848 | 8 |
| 9 | 1012 | 1728 | 9 |
| 10 | 1029 | 1688 | 10 |



Number of reservations per month per year and difference to the month before

```
with monthly_res as(  
    select extract(year from (interval).begints) as year,  
           extract(month from(interval).begints) as month,  
           count(*) as cnt  
    FROM reservation  
    Group by year, month  
)  
SELECT year, month, cnt,  
       COALESCE(cnt-lag(cnt)over(order by year,month),0) as cntdiff  
from monthly_res  
order by year, month;
```

| | year numeric | month numeric | cnt bigint | cntdiff bigint |
|----|-----------------|------------------|---------------|-------------------|
| 1 | 2023 | 6 | 2 | 0 |
| 2 | 2023 | 7 | 58 | 56 |
| 3 | 2023 | 8 | 174 | 116 |
| 4 | 2023 | 9 | 182 | 8 |
| 5 | 2023 | 10 | 183 | 1 |
| 6 | 2023 | 11 | 180 | -3 |
| 7 | 2023 | 12 | 174 | -6 |
| 8 | 2024 | 1 | 183 | 9 |
| 9 | 2024 | 2 | 178 | -5 |
| 10 | 2024 | 3 | 169 | -9 |
| 11 | 2024 | 4 | 181 | 12 |
| 12 | 2024 | 5 | 176 | -5 |
| 13 | 2024 | 6 | 184 | 8 |
| 14 | 2024 | 7 | 146 | -38 |
| 15 | 2024 | 8 | 9 | -137 |
| 16 | 2024 | 9 | 1 | -8 |