

SQL PORTFOLIO PROJECT REPORT

By

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DA 6 BLACK

1. Introduction

This project explores medical appointment data from Virginia State, USA. Its main aim is to identify factors contributing to patient no-shows. Using SQL, the analysis examines scheduling trends, patient demographics, and behaviors to provide insights for healthcare operations. By understanding when and why patients miss appointments, clinics can enhance attendance rates, improve scheduling, and refine communication strategies. This data-driven approach helps medical teams boost efficiency, reduce wasted resources, and foster reliable patient engagement, ultimately leading to smarter healthcare systems.

2. Dataset Overview

The dataset contains 9,916 rows and 15 columns and has following key features:

- a) PatientId, AppointmentID are unique identifiers.
- b) ScheduledDay, AppointmentDay: Timing of bookings.
- c) Age, Gender, Neighbourhood: Demographic information.
- d) SMS_received: Reminder indicator.
- e) Showed_up: Attendance outcome.
- f) Clinical indicators (Diseases): Hypertension, Diabetes, etc.

These columns closely relate to understanding factors impacting appointment attendance.

3. Methodology and SQL Tasks

Task 1

Question: Retrieve all columns from the Appointments table.

SQL Query:



Output Screenshot:

PatientId	AppointmentID	Gender	ScheduledDay	AppointmentDay	Age	Neighbourhood	Scholarship	Hypertension	Diabetes	Alcoholism	Handcap	SMS_received	Date_diff	Showed_up	AppointmentStatus
10001	b5ef1ee6-7ff3-44b9-b69f-a399e1bfff1a	Male	2023-02-26	2023-03-06	50	Alexandria	0	0	0	0	0	1	8	Yes	attended
10002	28a625e1-4133-4ed1-9821-8c7556c8c3c7	Female	2023-02-19	2023-02-26	70	Alexandria	0	0	0	0	0	1	7	Yes	attended
10003	9631be62-13b4-48db-99bc-e2196fb398f4	Male	2023-04-05	2023-04-08	95	Arlington	1	0	0	0	0	0	3	Yes	attended
10004	3dc1e882-0712-4fb9-9cd6-f58eb457bba6	Male	2023-05-27	2023-06-02	47	Newport News	1	1	0	0	0	1	6	Yes	attended
10005	4279dc6-85e7-4c6c-8800-69fbd4c7ca67	Male	2023-05-13	2023-05-27	18	Alexandria	0	0	0	0	0	1	14	Yes	attended

Summary/Interpretation: Displays every appointment record and column for initial assessment.

Task 2

Question: List the first 10 appointments where the patient is older than 60.

SQL Query:

```
select * from appointments
where age>60
limit 10;
```

Output Screenshot:

PatientId	AppointmentId	Gender	ScheduledDay	AppointmentDay	Age	Neighbourhood	Scholarship	Hypertension	Diabetes	Alcoholism	Handcap	SMS_received	Date_diff	Showed_up	AppointmentStatus
10002	28a625e1-4133-4ed1-9821-8c7556c8c3c7	Female	2023-02-19	2023-02-26	70	Alexandria	0	0	0	0	0	1	7	Yes	attended
10003	9631be62-13b4-48db-99bc-e2196fb398f4	Male	2023-04-05	2023-04-08	95	Arlington	1	0	0	0	0	0	3	Yes	attended
10007	bfe46ba0-6706-42f2-9c3d-7f9635c55a81	Male	2023-05-01	2023-05-12	83	Fairfax	0	0	1	0	0	1	11	Yes	attended
10013	e312e7dd-a6b8-4e23-9ef9-5050d4838cd3	Male	2023-03-17	2023-03-25	68	Charlottesville	0	0	0	0	0	0	8	Yes	attended
10016	4b662fe0-c789-4c91-8ea5-102b2a14eafd	Male	2023-03-08	2023-03-11	63	Fairfax	0	0	0	0	0	0	3	Yes	attended

Summary/Interpretation: Shows sample senior patient appointments used to explore elderly attendance behavior.

Task 3

Question: **Show the unique neighborhoods** from which patients came.

SQL Query:

```
select distinct Neighbourhood
from appointments;
```

Output Screenshot:

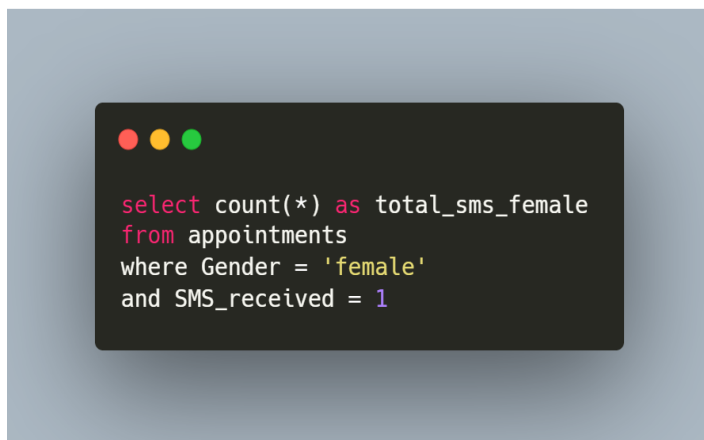
Neighbourhood
Alexandria
Arlington
Newport News
Norfolk
Fairfax

Summary/Interpretation: Identifies the geographical diversity of patients.

Task 4

Question: **Find all female patients** who received an SMS reminder. Give count of them

SQL Query:



Output Screenshot:

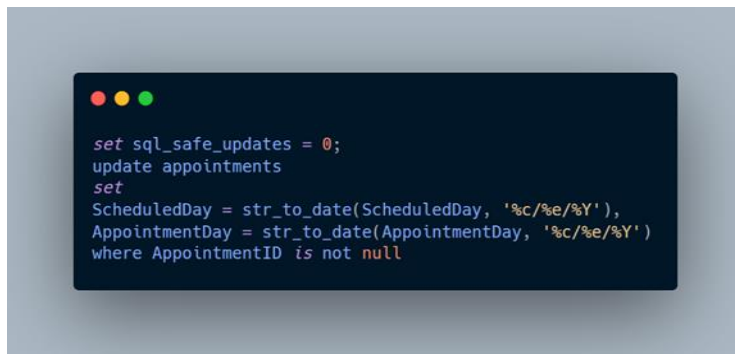
total_sms_female
3465

Summary/Interpretation: Total number of female patients who received SMS.

Task 5

Question: Update the dates in ScheduledDay and AppointmentDay columns to the correct date format (hint: str_to_date() is a very helpful function to sort out dates)

SQL Query:



Output screenshot:

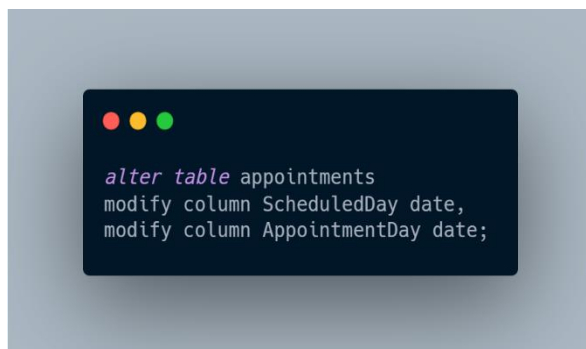
PatientId	AppointmentID	Gender	ScheduledDay	AppointmentDay	Age	Neighbourhood	Scholarship	Hypertension	Diabetes	Alcoholism	Handicap	SMS_received	Date_diff	Showed_up	AppointmentStatus
10001	b5ef1ee6-7ff3-44b9-b69f-a399e1bfff1a	Male	2023-02-26	2023-03-06	50	Alexandria	0	0	0	0	0	1	8	Yes	attended
10002	28a625e1-4133-4ed1-9821-8c7556c8c3c7	Female	2023-02-19	2023-02-26	70	Alexandria	0	0	0	0	0	1	7	Yes	attended
10003	9631be62-13b4-48db-99bc-e2196fb398f4	Male	2023-04-05	2023-04-08	95	Arlington	1	0	0	0	0	0	3	Yes	attended
10004	3dc1e882-0712-4fb9-9cd6-f58eb457bba6	Male	2023-05-27	2023-06-02	47	Newport News	1	1	0	0	0	1	6	Yes	attended
10005	4279dcd6-86e7-4c6c-8800-69fdb4c7ca67	Male	2023-05-13	2023-05-27	18	Alexandria	0	0	0	0	0	1	14	Yes	attended

Summary/interpretation: Converts date strings to DATE type.

Task 6

Question: Modify the datatypes of the ScheduledDay and AppointmentDay columns to DATE

SQL Query:



Output screenshot:

PatientId	AppointmentID	Gender	ScheduledDay	AppointmentDay	Age	Neighbourhood	Scholarship	Hypertension	Diabetes	Alcoholism	Handicap	SMS_received	Date_diff	Showed_up	AppointmentStatus
10001	b5ef1ee6-7ff3-44b9-b69f-a399e1bfff1a	Male	2023-02-26	2023-03-06	50	Alexandria	0	0	0	0	0	1	8	Yes	attended
10002	28a625e1-4133-4ed1-9821-8c7556c8c3c7	Female	2023-02-19	2023-02-26	70	Alexandria	0	0	0	0	0	1	7	Yes	attended
10003	9631be62-13b4-48db-99bc-e2196fb398f4	Male	2023-04-05	2023-04-08	95	Arlington	1	0	0	0	0	0	3	Yes	attended
10004	3dc1e882-0712-4fb9-9cd6-f58eb457bba6	Male	2023-05-27	2023-06-02	47	Newport News	1	1	0	0	0	1	6	Yes	attended
10005	4279dcd6-86e7-4c6c-8800-69fdb4c7ca67	Male	2023-05-13	2023-05-27	18	Alexandria	0	0	0	0	0	1	14	Yes	attended

Summary: Changes columns to DATE format.

Task 7

Question: Update the 'Showed_up' status to 'Yes' where it is null or empty

SQL Query:



Output Screensshot:

PatientId	AppointmentId	Gender	ScheduledDay	AppointmentDay	Age	Neighbourhood	Scholarship	Hypertension	Diabetes	Alcoholism	Handcap	SMS_received	Date_diff	Showed_up	AppointmentStatus
10001	b5ef1ee6-7ff3-44b9-b69f-a399e1bfff1a	Male	2023-02-26	2023-03-06	50	Alexandria	0	0	0	0	0	1	8	Yes	attended
10002	28a625e1-4133-4ed1-9821-8c7556c83c7	Female	2023-02-19	2023-02-26	70	Alexandria	0	0	0	0	0	1	7	Yes	attended
10003	9631be62-13b4-48db-99bc-e2196fb398f4	Male	2023-04-05	2023-04-08	95	Arlington	1	0	0	0	0	0	3	Yes	attended
10004	3dc1e882-0712-4fb9-9cd6-f58eb457bba6	Male	2023-05-27	2023-06-02	47	Newport News	1	1	0	0	0	1	6	Yes	attended
10005	4279dcd6-85e7-4c5c-8800-69fbd4c7ca67	Male	2023-05-13	2023-05-27	18	Alexandria	0	0	0	0	0	1	14	Yes	attended

Summary: Fills missing attendance with 'Yes'.

Task 8

Question: Add a new column AppointmentStatus using a CASE statement:

- o 'No Show' if Showed_up = 'No'
- o 'Attended' otherwise

SQL Query:



Output Screenshot:

PatientId	AppointmentId	Gender	ScheduledDay	AppointmentDay	Age	Neighbourhood	Scholarship	Hypertension	Diabetes	Alcoholism	Handcap	SMS_received	Date_diff	Showed_up	AppointmentStatus
10001	b5ef1ee6-7ff3-44b9-b69f-a399e1bfff1a	Male	2023-02-26	2023-03-06	50	Alexandria	0	0	0	0	0	1	8	Yes	attended
10002	28a625e1-4133-4ed1-9821-8c7556c83c7	Female	2023-02-19	2023-02-26	70	Alexandria	0	0	0	0	0	1	7	Yes	attended
10003	9631be62-13b4-48db-99bc-e2196fb398f4	Male	2023-04-05	2023-04-08	95	Arlington	1	0	0	0	0	0	3	Yes	attended
10004	3dc1e882-0712-4fb9-9cd6-f58eb457bba6	Male	2023-05-27	2023-06-02	47	Newport News	1	1	0	0	0	1	6	Yes	attended
10005	4279dcd6-85e7-4c5c-8800-69fbd4c7ca67	Male	2023-05-13	2023-05-27	18	Alexandria	0	0	0	0	0	1	14	Yes	attended

Summary: Adds a new column of appointment status with no-show or attended values

Task 9

Question: Filter appointments for diabetic patients with hypertension.

SQL Query:

```
select * from appointments
where Diabetes = 1
and
Hypertension = 1;
```

Output Screenshot:

PatientId	AppointmentID	Gender	ScheduledDay	AppointmentDay	Age	Neighbourhood	Scholarship	Hypertension	Diabetes	Alcoholism	Handcap	SMS_received	Date_diff	Showed_up	AppointmentStatus
10023	ce74ec56-d642-4295-95a2-b7e4351399ed	Female	2023-03-09	2023-03-21	14	Newport News	0	1	1	0	0	1	12	Yes	attended
10028	2f33d653-4421-4249-a3f6-b904fab34b7f	Female	2023-02-26	2023-03-11	25	Charlottesville	1	1	1	0	0	0	13	Yes	attended
10045	8a38ef1d-015d-441f-8e22-0c2dea771919	Female	2023-05-19	2023-05-26	16	Newport News	0	1	1	1	0	1	7	No	no show
10047	edfc1ab2-c198-4cb-a5cf-f923bdc8c9c95	Female	2023-03-29	2023-04-05	66	Norfolk	0	1	1	0	0	1	7	Yes	attended
10128	cf03c9ad-72d5-4bd4-9ed6-d4366cf3638	Male	2023-06-01	2023-06-01	91	Chesapeake	0	1	1	0	0	1	0	Yes	attended

Summary: Lists patients with both conditions i.e. Hypertension and Diabetes

Task 10

Question: Order the records by Age in descending order and show only the top 5 oldest patients.

SQL Query:

```
select * from appointments
order by Age desc
limit 5;
```

Output Screenshot:

PatientId	AppointmentID	Gender	ScheduledDay	AppointmentDay	Age	Neighbourhood	Scholarship	Hypertension	Diabetes	Alcoholism	Handcap	SMS_received	Date_diff	Showed_up	AppointmentStatus
10471	997836f3-c3b2-40de-b9de-4c5b308995e3	Male	2023-02-15	2023-03-01	99	Virginia Beach	0	0	0	0	0	1	14	Yes	attended
10079	478cd78d-c096-4c4b-9ea4-6e7d3cf873f8	Male	2023-05-27	2023-05-28	99	Alexandria	0	1	0	0	0	0	1	Yes	attended
10546	d52271b92-2a9d-498c-a94c-04b4f604fcef	Female	2023-01-22	2023-01-28	99	Chesapeake	0	0	0	0	0	1	6	Yes	attended
10246	6dabaa1c-5868-432a-84c7-71063811f9e9	Female	2023-01-11	2023-01-19	99	Fairfax	0	0	0	0	0	1	8	Yes	attended
10425	5a181f58-d9c2-4396-8eef-48d8b0908f13	Female	2023-02-26	2023-02-26	99	Alexandria	1	0	0	0	0	0	0	No	no show

Summary: Lists top 5 oldest patients

Task 11

Question: Limit results to the first 5 appointments for patients under age 18.

SQL Query:



Output Screenshot:

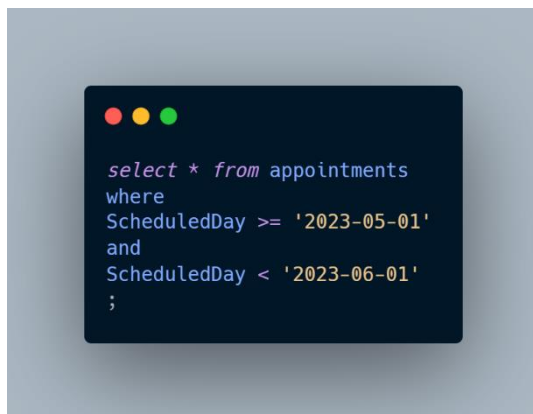
PatientId	AppointmentId	Gender	ScheduledDay	AppointmentDay	Age	Neighbourhood	Scholarship	Hypertension	Diabetes	Alcoholism	Handicap	SMS_received	Date_diff	Showed_up	AppointmentStatus
10006	7a134ada-2e51-46bd-9857-0bc325ac7254	Female	2023-01-22	2023-01-25	5	Norfolk	0	1	0	0	0	0	3	Yes	attended
10011	1b3e2271-1a71-4bdf-bb6d-e07125b08a57	Male	2023-01-21	2023-01-26	6	Roanoke	0	0	0	0	0	1	5	Yes	attended
10014	1ee5abec-9b53-4a4f-ad09-82b77d76ea43	Male	2023-02-15	2023-02-28	10	Richmond	0	0	0	1	0	0	13		attended
10015	6c456d93-1b4a-48ae-bde7-e7137fd82831	Male	2023-02-08	2023-02-10	14	Alexandria	1	0	0	0	0	0	2	Yes	attended
10017	8b0ed975-e20c-4794-9de5-d2eb28596e80	Female	2023-04-13	2023-04-20	2	Virginia Beach	0	0	1	0	0	0	7	No	no show

Summary: Lists top 5 youngest patients who visited

Task 12

Question: Display all appointments scheduled on or after '2023-05-01' and before '2023-06-01'.

SQL Query:



Output Screenshot:

PatientId	AppointmentId	Gender	ScheduledDay	AppointmentDay	Age	Neighbourhood	Scholarship	Hypertension	Diabetes	Alcoholism	Handicap	SMS_received	Date_diff	Showed_up	AppointmentStatus
10004	3dc1e882-0712-4fb9-9cd6-f58eb457bba6	Male	2023-05-27	2023-06-02	47	Newport News	1	1	0	0	0	1	6	Yes	attended
10005	4279ddc6-86e7-4c6c-8800-69fbd4c7ca67	Male	2023-05-13	2023-05-27	18	Alexandria	0	0	0	0	0	1	14	Yes	attended
10007	bfe46ba0-6706-42f2-9c3d-7f9635c65a81	Male	2023-05-01	2023-05-12	83	Fairfax	0	0	1	0	0	1	11	Yes	attended
10031	124abc16-de4c-4944-8678-4f498bdeb84a	Male	2023-05-27	2023-06-09	20	Roanoke	0	0	1	0	0	1	13	No	no show
10033	374e3e12-ebed-45d4-84f2-99efc26cd636	Female	2023-05-10	2023-05-17	37	Charlottesville	0	0	0	0	0	1	7	No	no show

Summary: Shows all patients appointments booked in the month of May.

Task 13

Question: Find the average age of patients for each gender.

SQL Query:


```

select gender,
avg(Age) as avg_age_per_gender
from appointments
group by gender;

```

Output Screenshot:

gender	avg_age_per_gender
Male	50.3641
Female	49.7444

Summary: Shows average age of all genders

Task 14

Question: Count how many patients received SMS reminders, grouped by Showed_up status.

SQL Query:

```

select Showed_up,
count(*) as SMS_reminders
from appointments
where SMS_received = 1
group by Showed_up
;

```

Output screenshot:

Showed_up	SMS_reminders
Yes	5403
No	1478
	2

Summary: Counts reminders by attendance.

Task 15

Question: Count no-show appointments in each neighborhood using GROUP BY.

SQL Query:

```

select Neighbourhood,
count(*) as no_show_appointments
from appointments
where Showed_up = 'No'
group by Neighbourhood
;

```

Output Screenshot:

Neighbourhood	no_show_appointments
Newport News	188
Virginia Beach	196
Richmond	193
Chesapeake	210
Roanoke	214

Summary: Total number patients who never showed up for their appointments per neighbourhood.

Task 16

Question: Show neighborhoods with more than 100 total appointments (HAVING clause).

SQL Query:

```

select Neighbourhood,
count(*) as patient_appointments
from appointments
group by Neighbourhood
having count(*) > 100
;

```

Output Screenshot:

Neighbourhood	patient_appointments
Alexandria	1018
Arlington	1027
Newport News	991
Norfolk	999
Fairfax	977

Summary: Shows neighborhoods with more than 100 total appointments.

Task 17

Question: Use CASE to calculate the total number of:

- children (Age < 12)
- adults (Age BETWEEN 12 AND 60)
- seniors (Age > 60)

SQL Query:

```
select sum(
case
when Age < 12
then 1
else 0
end)
as Children
from appointments
;

-- -- Total number of children = 1074

select sum(
case
when Age between 12 and 60
then 1
else 0
end)
as Adults
from appointments
;

-- Total number of Adults = 4910

select sum(
case
when Age > 60
then 1
else 0
end)
as Seniors
from appointments
;

-- Total number of Seniors = 3932
```

Output screenshot:

Adults	Children	Seniors
4910	1074	3932

Summary: Shows total number of appointments per age group.

Task 18

Question: Show whether patients are more likely to miss appointments on certain days of the week.

SQL Query:

```
select dayname(AppointmentDay)
as Day_of_the_week,
count(*) as Total_Appointments,
sum(case when Showed_up = 'Yes'
then 1
else 0
end)
as Showed,
sum(case when Showed_up = 'No'
then 1
else 0
end)
as No_Show,
round(count(case when Showed_up = 'Yes'
then 1
end) * 100.0/count(*),2) as Showed_Percentage,
round(count(case when Showed_up = 'No'
then 1
end) * 100.0/count(*),2) as No_Show_Percentage
from appointments
group by dayname(AppointmentDay)
order by No_Show_Percentage desc
;
```

Output Screenshot:

Day_of_the_week	Total_Appointments	Showed	No_Show	Showed_Percentage	No_Show_Percentage
Sunday	1417	1101	316	77.70	22.30
Monday	1365	1074	291	78.68	21.32
Saturday	1419	1121	297	79.00	20.93
Thursday	1488	1180	308	79.30	20.70
Tuesday	1463	1160	301	79.29	20.57

Summary: Shows no_Show rates by weekday. Sorting from worst to best.

Task 19

Question: Track how appointments accumulate over time in each neighbourhood.

SQL Query:

```

select AppointmentDay,
Neighbourhood,
count(*) as Daily_Appointments,
sum(count(*))
over(partition by Neighbourhood
order by AppointmentDay)
as Running_Total
from appointments
group by Neighbourhood, AppointmentDay
;

```

Output Screenshot:

AppointmentDay	Neighbourhood	Daily_Appointments	Running_Total
2023-01-03	Alexandria	1	1
2023-01-05	Alexandria	1	2
2023-01-06	Alexandria	1	3
2023-01-07	Alexandria	5	8
2023-01-08	Alexandria	3	11

Summary: Running total of appointments per neighborhood.

Task 20

Question: Use Dense_Rank() to rank patients by age within each gender group.

SQL Query:

```

select PatientId,
Gender,
Age,
dense_rank( )
over(partition by Gender
order by Age desc)
as Age_Rank
from appointments
;

```

Output Screenshot:

PatientId	Gender	Age	Age_Rank
19876	Female	99	1
12436	Female	99	1
11766	Female	99	1
11077	Female	99	1
13167	Female	99	1

Summary: Ranks patients by age within each gender.

Task 21

Question: How many days have passed since the last appointment in the same neighborhood?

SQL Query:

```

select PatientId,
AppointmentDay,
Neighbourhood,
datediff(AppointmentDay,
lag(AppointmentDay)
over(partition by Neighbourhood
order by AppointmentDay))
as days_since_last_appointment
from appointments
;

```

Output Screenshot:

PatientId	AppointmentDay	Neighbourhood	days_since_last_appointment
12161	2023-01-03	Alexandria	NULL
16689	2023-01-05	Alexandria	2
15883	2023-01-06	Alexandria	1
17174	2023-01-07	Alexandria	1
14045	2023-01-07	Alexandria	0

Summary: Days since the last appointment in the same neighborhood.

Task 22

Question: Which neighborhoods have the highest number of missed appointments?

SQL Query:

```

with No_Shows as(
  select
    Neighbourhood,
    count(*) as No_Show_Total
  from appointments
  where Showed_up = 'No'
  group by Neighbourhood)
select
  Neighbourhood,
  No_Show_Total,
  dense_rank()
  over(order by No_Show_Total desc)
  as No_Show_Rank
from No_Shows
;

```

Output Screenshot:

Neighbourhood	No_Show_Total	No_Show_Rank
Charlottesville	217	1
Fairfax	215	2
Roanoke	214	3
Norfolk	211	4
Alexandria	211	4

Summary: Ranks neighbourhoods by number of no-shows, with highest to lowest.

Task 23

Question: Continuing from Q. 21, show the neighbourhoods with the second and third highest no show counts.

SQL Query:

```

with No_Show_ranking as (
  select Neighbourhood,
    count(*) as No_Show_Count,
    dense_rank()
    over(order by count(*) desc)
    as No_Show_Rank
  from appointments
  where Showed_up = 'No'
  group by Neighbourhood)
select * from No_Show_Ranking
where No_Show_Rank in (2, 3)
;

```

Output Screenshot:

Neighbourhood	No_Show_Count	No_Show_Rank
Fairfax	215	2
Roanoke	214	3

Summary: Finds neighbourhoods with the 2nd and 3rd highest no-shows.

Task 24

Question: Find out all female patients that have an age higher than the average age of all female patients

SQL Query:



Output Screenshot:

PatientId	AppointmentID	Gender	ScheduledDay	AppointmentDay	Age	Neighbourhood	Scholarship	Hypertension	Diabetes	Alcoholism	Handicap	SMS_received	Date_diff	Showed_up	AppointmentStatus
10002	28a625e1-4133-4ed1-9821-8c7556c8c3c7	Female	2023-02-19	2023-02-26	70	Alexandria	0	0	0	0	0	1	7	Yes	attended
10018	44a912f7-49f8-4292-9d30-6afa5f380b5b	Female	2023-06-18	2023-06-18	68	Newport News	0	1	0	1	0	0	0	Yes	attended
10025	feb1e270-69c8-4b17-bf33-6ada2e20766f	Female	2023-04-09	2023-04-20	92	Chesapeake	0	0	0	0	0	1	11	Yes	attended
10026	cb725702-9192-418f-bbe3-f251f6096928	Female	2023-02-16	2023-02-23	69	Richmond	0	1	0	0	0	1	7	Yes	attended
10030	6c1c0ab6-0f80-44cc-93d2-9821d42de47a	Female	2023-03-10	2023-03-24	71	Roanoke	0	1	0	0	0	0	14	No	no show

Summary: Lists female patients older than the average female age.

Task 25

Question: Find out all details of the most recent appointment in each neighbourhood based on appointmentday.

SQL Query:


```

with Latest_Appointments as (
  select Neighbourhood,
         max(AppointmentDay) as
         Latest_Day
  from appointments
  group by Neighbourhood)
select a.*
from appointments a
join Latest_Appointments l
on a.Neighbourhood = l.Neighbourhood
and a.AppointmentDay = l.Latest_Day
;

```

Output Screenshot:

PatientId	AppointmentID	Gender	ScheduledDay	AppointmentDay	Age	Neighbourhood	Scholarship	Hypertension	Diabetes	Alcoholism	Handicap	SMS_received	Date_diff	Showed_up	AppointmentStatus
10288	0a7f9c87-55a3-4387-8edd-6053845ba1d0	Male	2023-06-26	2023-07-10	77	Roanoke	0	0	0	0	0	1	14	Yes	attended
12050	ec4643db-3c20-47bf-9815-c81bca43f7c5	Male	2023-06-27	2023-07-11	59	Charlottesville	0	1	0	0	0	1	14	Yes	attended
13426	1581184d-19d9-4470-a4a9-c4277dcded63	Female	2023-06-28	2023-07-12	69	Virginia Beach	0	0	0	0	0	0	14	Yes	attended
13911	62b6c581-22ac-4bed-ad11-2b4cbe6ad03d	Female	2023-06-29	2023-07-12	85	Newport News	1	0	0	0	0	1	13	Yes	attended
14213	b8011c29-6c03-41b1-be0e-00229aa28ce1	Male	2023-06-29	2023-07-12	76	Alexandria	0	0	0	0	0	1	13	Yes	attended

Summary: Shows most recent appointment in each neighborhood.

4. Key Findings

Demographics: Younger adults and certain neighborhoods consistently showed higher no-show rates, indicating possible barriers such as work schedules, transportation, or lower prioritization of appointments.

Reminders: Patients who received SMS reminders were significantly more likely to attend, confirming that timely communication has a strong impact on attendance.

Day-of-Week Trends: Mondays and weekends exhibited the highest no-show percentages, suggesting that scheduling patterns may influence attendance.

Chronic Conditions: Patients with both hypertension and diabetes tended to maintain better attendance, possibly due to higher health awareness.

Neighborhood Disparities: Some neighborhoods not only had higher appointment volumes but also disproportionately high no-show counts, highlighting the need for location-specific interventions.

5. Recommendations

Targeted Reminder Strategy: Increase frequency or personalize reminders for younger patients and residents of high no-show neighborhoods.

Adjust Scheduling: Reduce high-demand slots on Mondays and weekends, or introduce incentives for attending appointments during these days.

Community Outreach: Partner with local organizations in high no-show areas to address transportation or awareness issues.

Chronic Patient Support: Maintain and expand follow-up programs for chronic patients, as their attendance patterns suggest they are responsive to consistent care.

Flexible Booking: Introduce easier rescheduling options, including online self-service, to help patients avoid missing appointments.

6. Conclusion

The SQL analysis provided a clear, data-driven view of attendance patterns, uncovering how demographics, reminders, day-of-week, and neighborhood factors influence no-shows. By combining targeted communication, strategic scheduling, and localized support, clinics can significantly reduce no-shows and improve resource allocation. This project demonstrated that SQL is not only a tool for retrieving data but a powerful means of turning raw records into actionable strategies that directly support better patient care and operational efficiency.