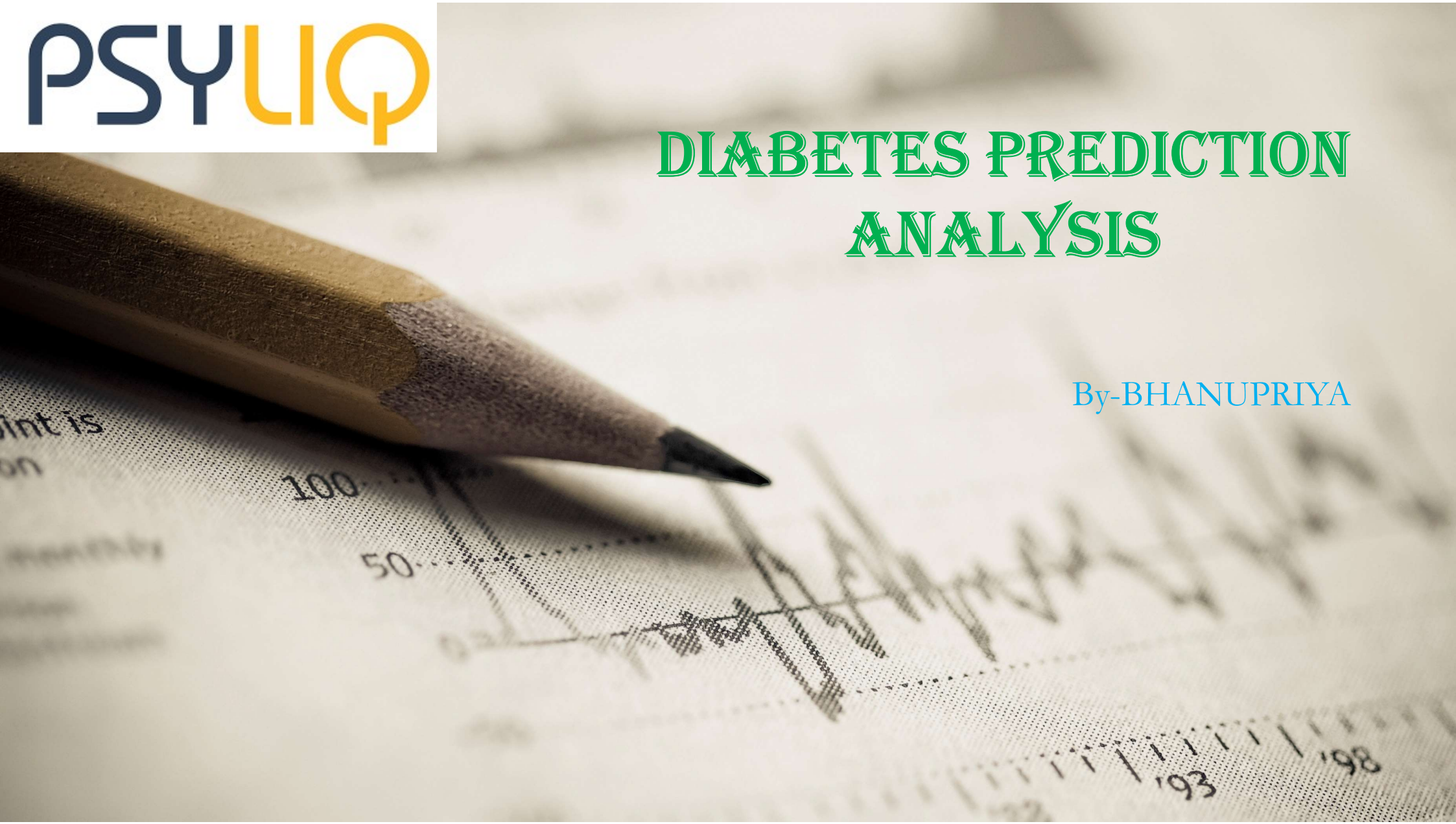
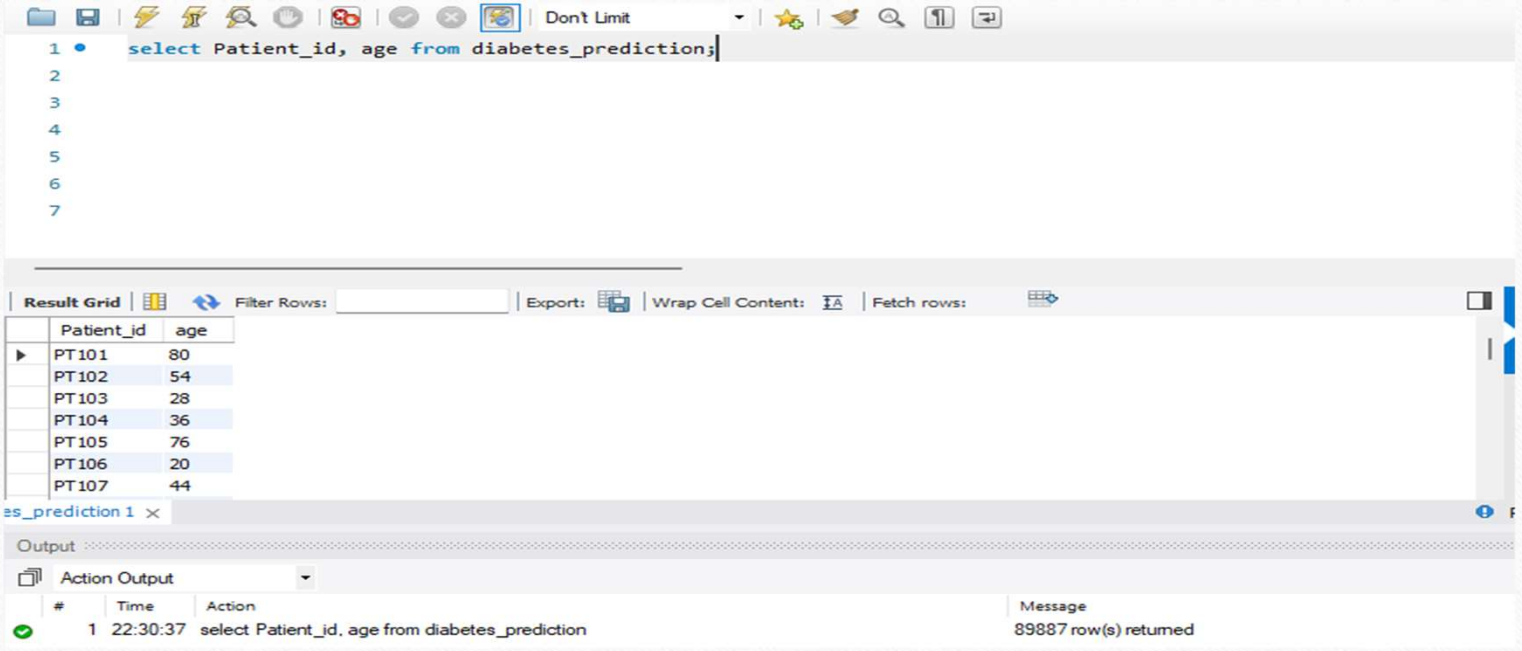


DIABETES PREDICTION ANALYSIS

By-BHANUPRIYA

Retrieve the Patient_id and ages of all patients.

```
SELECT Patient_id, age FROM diabetics_predictions;
```



Select all female patients who are older than 40.

SELECT * FROM diabetics_prediction WHERE gender= “female” AND age> 40;

```
1
2 •  select * from diabetes_prediction where gender = "female" and age>40;
3
4
5
6
```

esult Grid | Filter Rows: | Export: | Wrap Cell Content: | Fetch rows:

ï»¿EmployeeName	Patient_id	gender	age	hypertension	heart_disease	smoking_history	bmi	HbA1c_level	blood_glucose_level	diabe
NATHANIEL FORD	PT101	Female	80	0	1	never	25.19	6.6	140	0
GARY JIMENEZ	PT102	Female	54	0	0	No Info	27.32	6.6	80	0
ALSON LEE	PT107	Female	44	0	0	never	19.31	6.5	200	1
DAVID KUSHNER	PT108	Female	79	0	0	No Info	23.86	5.7	85	0
ARTHUR KENNEY	PT111	Female	53	0	0	never	27.32	6.1	85	0
PATRICIA JACKSON	PT112	Female	54	0	0	former	54.7	6	100	0

abetes_prediction 8 ×

utput

Action Output

#	Time	Action	Message
7	22:53:10	select * from diabetes_prediction where gender = "female" and age>40	27929 row(s) returned

Calculate the average BMI of patients.

```
SELECT AVG(bmi) FROM diabetes_prediction;
```

```
1 • select avg(bmi) from diabetes_prediction;
2
3
4
5
6
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

avg(bmi)
27.322404018376705

Find patients who have hypertension and diabetes.

SELECT * FROM diabetes_prediction WHERE hypertension =1 AND diabetes=1;

```
1 •  select * from diabetes_prediction where hypertension=1 and diabetes=1;
2
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content: | Fetch rows:

ï»¿EmployeeName	Patient_id	gender	age	hypertension	heart_disease	smoking_history	bmi	HbA1c_level	blood_g
JONES WONG	PT139	Male	50	1	0	current	27.32	5.7	260
PATRIC STEELE	PT205	Female	80	1	0	Ex-smoker	27.32	6.8	280
CHAD LAW	PT355	Male	63	1	0	Ex-smoker	35.06	5.8	200
CATHERINE JAMES	PT451	Female	52	1	0	Ex-smoker	50.3	6.6	155
JOHN HART	PT565	Male	48	1	0	current	36.12	6.8	140
JOHN BARKER	PT567	Female	79	1	0	Ex-smoker	27.32	6.5	159
ROBERT BONNET	PT632	Female	49	1	0	not current	36.93	8.8	155
VITANI BENJAMIN	PT727	Male	43	1	0	not current	40.86	6.6	159

diabetes_prediction 6 ×

Output

Action Output

#	Time	Action	Message
45	14:28:33	select * from diabetes_prediction where hypertension=1 and diabetes=1	1557 row(s) returned

List patients in descending order of blood glucose levels.

SELECT * FROM diabetes_prediction ORDER BY blood_glucose_level DESC;

```
1 • select * from diabetes_prediction order by blood_glucose_level desc;
2
3
4
5
6
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content: | Fetch rows:

ï»¿EmployeeName	Patient_id	gender	age	hypertension	heart_disease	smoking_history	bmi	HbA1c_level	blood_glucose_level	diabetes
Aida C Henry	PT88238	Female	57	0	0	never	27.32	7	300	1
Ernesto Fortu	PT88333	Male	53	0	0	never	36.08	6.5	300	1
Janice Torbet	PT88440	Male	72	0	0	No Info	30.98	7	300	1
Jacqueline M Phillips	PT89191	Female	51	0	0	ever	27.46	7.5	300	1
Brenda G Velasquez	PT89459	Female	28	0	0	No Info	37.1	6.1	300	1
Victoria Gonzalez	PT89505	Male	68	0	0	ever	29.13	7.5	300	1

diabetes_prediction 10 ×

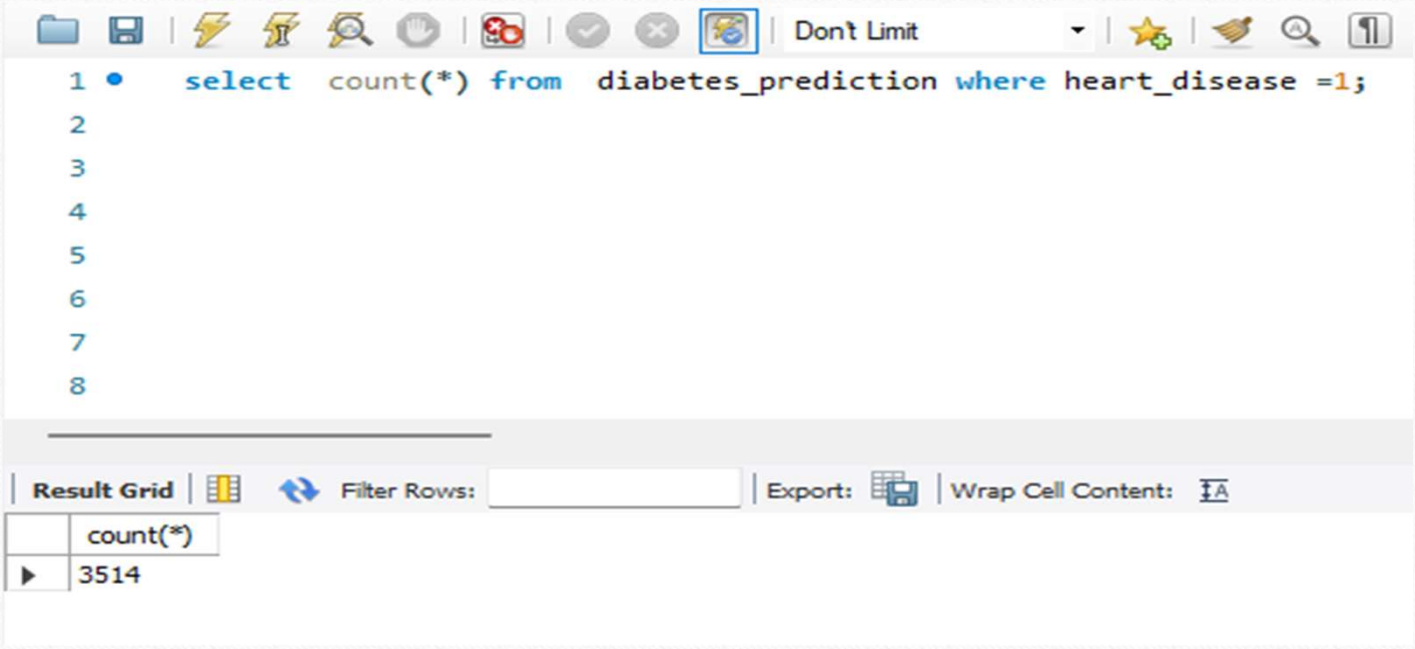
Output

Action Output

#	Time	Action	Message
9	22:53:20	select * from diabetes_prediction where gender = "female" and age>40	27929 row(s) returned

Determine the number of patients with heart disease.

```
SELECT COUNT(*) FROM diabetes_prediction WHERE heart_disease =1;
```



Group patients by smoking history and count how many smokers and nonsmokers there are.

```
SELECT smoking_history, COUNT(*) AS number_of_Pateints FROM diabetes_prediction
GROUP BY smoking_history;
```

```
1 •  SELECT smoking_history, COUNT(*) AS number_of_Pateints FROM diabetes_prediction G
2
```

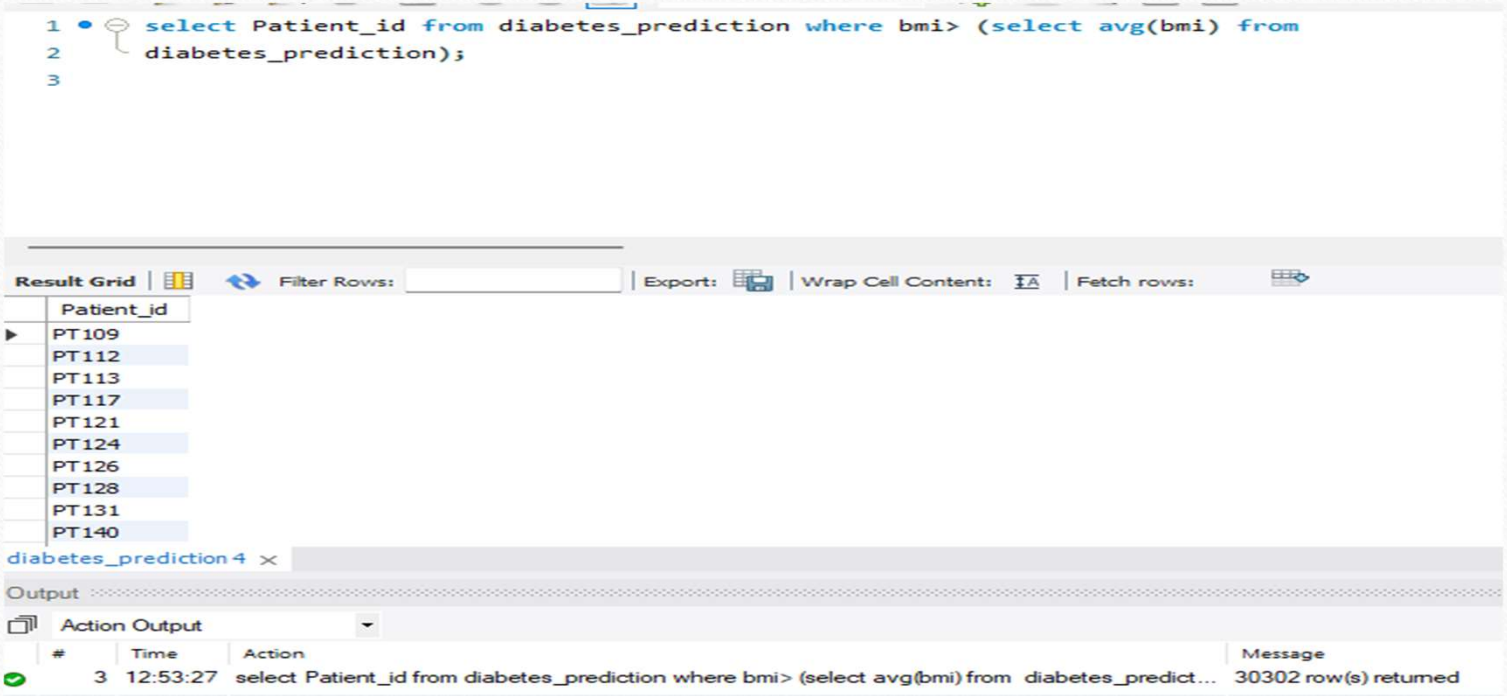
Result Grid | Filter Rows: | Export: | Wrap Cell Content:

smoking_history	number_of_Pateints
never	31608
No Info	32128
current	8343
former	8391
ever	3614
not current	5803

Result Grid
Form Editor

Retrieve the Patient_ids of patients who have a BMI greater than the average BMI.

SELECT Patient_id FROM diabetes_prediction WHERE bmi>(SELECT AVG(bmi) FROM diabetes_prediction);



Find the patient with the highest HbA1c level and the patient with the lowest HbA1clevel.

SELECT MIN(HbA1c_level), MAX(HbA1c_level) FROM diabetes_prediction;

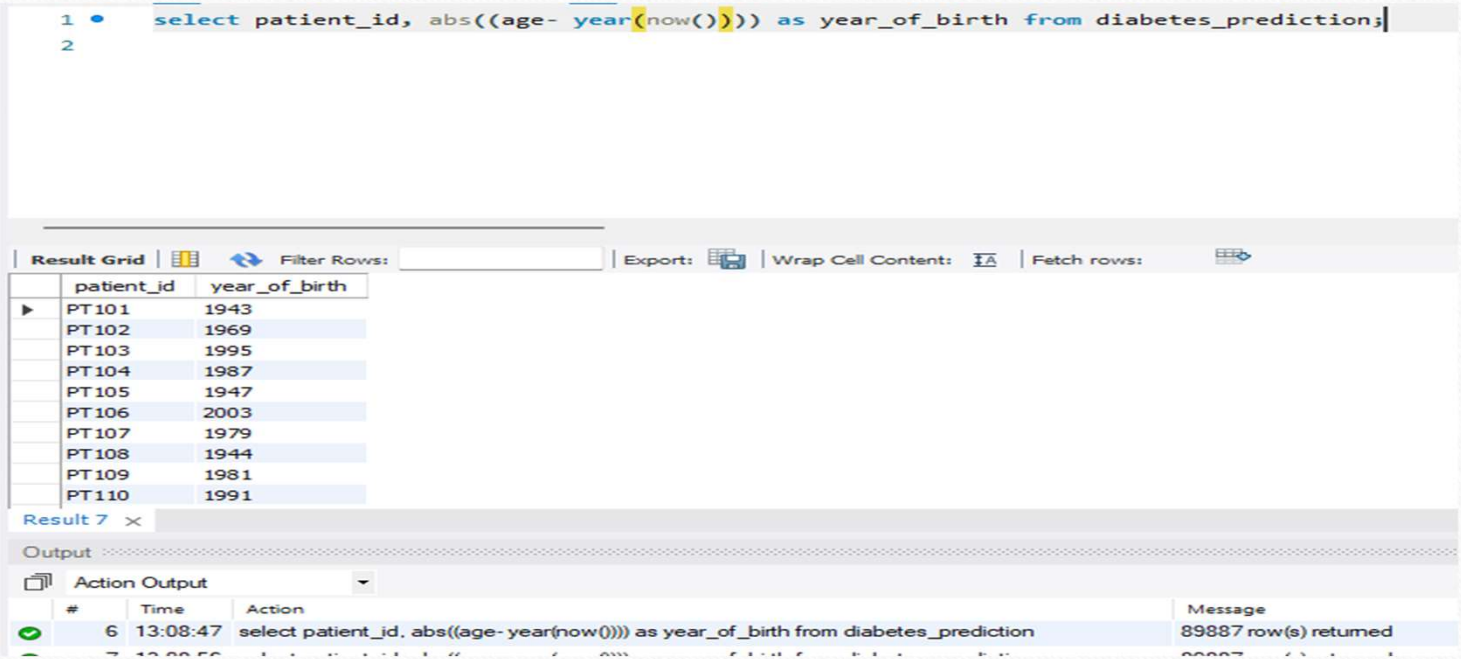
```
1 •  select min(HbA1c_level), max(HbA1c_level) from diabetes_prediction;
2
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

min(HbA1c_level)	max(HbA1c_level)
3.5	9

Calculate the age of patients in years (assuming the current date as of now).

```
SELECT Patient_id, ABS((age- year(now()))) AS year_of_birth from
diabetes_prediction;
```



Rank patients by blood glucose level within each gender group.

SELECT Pateint_id, gender, row_number() OVER(ORDER BY blood_glucose_level DESC , gender DESC) AS PT_Rank FROM diabetes_prediction;

```
1 •  select Patient_id, gender, row_number() over(order by blood_glucose_level desc, gender desc)
2    from diabetes_prediction;
3
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content: | Fetch rows:

Patient_id	gender	PT_Rank
PT87825	Male	1
PT89757	Male	2
PT89505	Male	3
PT88440	Male	4
PT88333	Male	5
PT75103	Male	6
PT75767	Male	7
PT75109	Male	8
PT78736	Male	9
PT77283	Male	10

Result 8

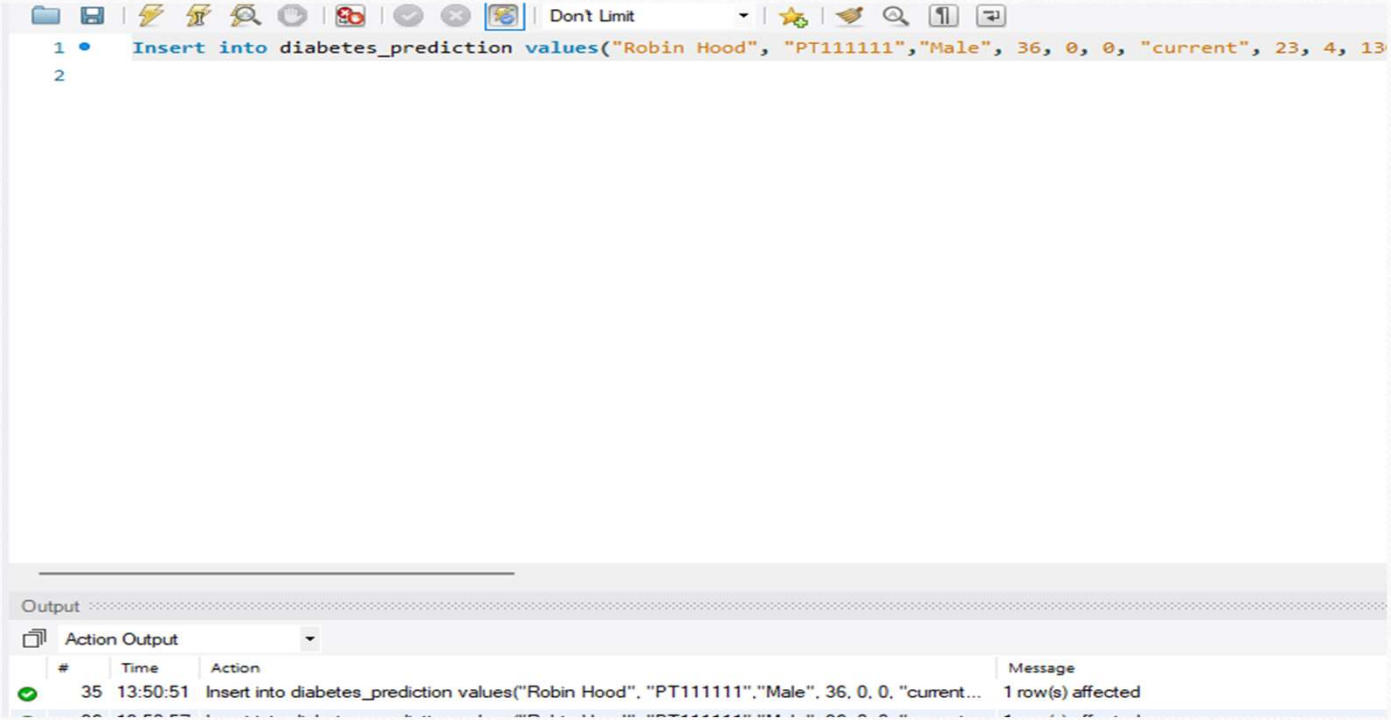
Output

Action Output

#	Time	Action	Message
7	13:08:56	select patient_id, abs((age- year(now()))) as year_of_birth from diabetes_prediction	89887 row(s) returned

. **Insert a new patient into the database with sample data**

INSERT INTO diabetes_prediction VALUES(“Robin Hood”, PT11111”, “Male”, 36, 0, 0, “current”,23, 4, 130 ,0);



Delete all patients with heart disease from the database.

DELETE FROM diabetes_prediction WHERE heart_disease;

```
1 •   delete  from diabetes_prediction where heart_disease=1;
2
```

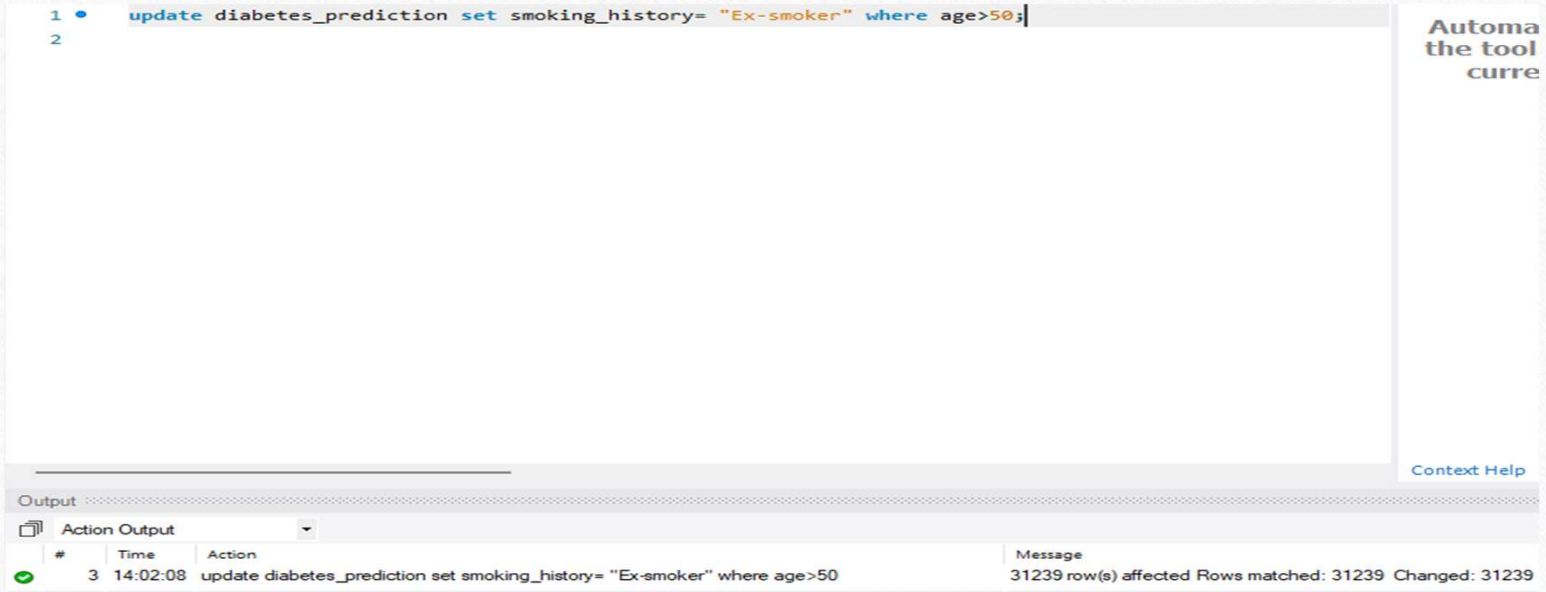
Output

Action Output

#	Time	Action	Message
1	13:56:44	delete from diabetes_prediction where heart_disease=1	3514 row(s) affected

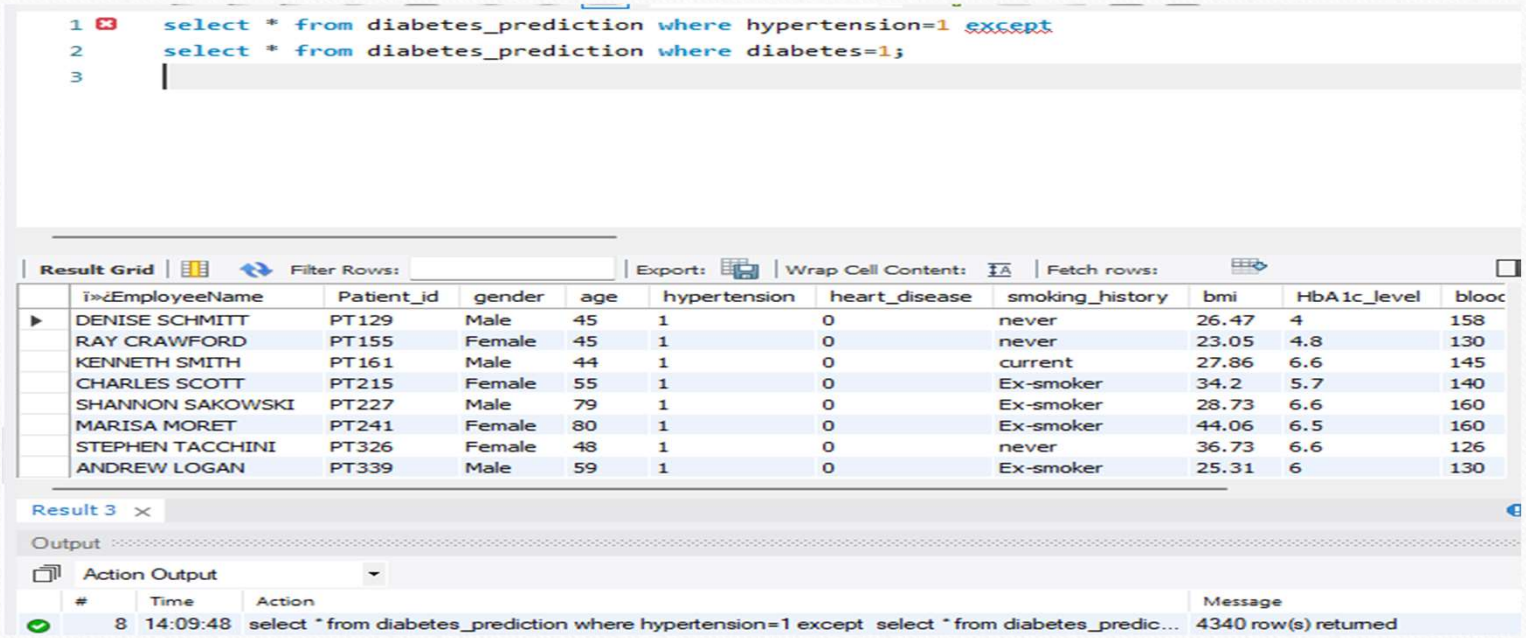
Update the smoking history of patients who are older than 50 to "Ex-smoker."

UPDATE diabetes_prediction SET smoking_history =“Ex-Smoker” WHERE age>50;



Find patients who have hypertension but not diabetes using the EXCEPT operator.

SELECT * FROM diabetes_prediction WHERE hypertension =1 EXCEPT SELECT * FROM diabetes_prediction WHERE diabetes=1;



```
1  select * from diabetes_prediction where hypertension=1 except
2  select * from diabetes_prediction where diabetes=1;
3
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content: | Fetch rows:

ï»¿EmployeeName	Patient_id	gender	age	hypertension	heart_disease	smoking_history	bmi	HbA1c_level	blooc
DENISE SCHMITT	PT129	Male	45	1	0	never	26.47	4	158
RAY CRAWFORD	PT155	Female	45	1	0	never	23.05	4.8	130
KENNETH SMITH	PT161	Male	44	1	0	current	27.86	6.6	145
CHARLES SCOTT	PT215	Female	55	1	0	Ex-smoker	34.2	5.7	140
SHANNON SAKOWSKI	PT227	Male	79	1	0	Ex-smoker	28.73	6.6	160
MARISA MORET	PT241	Female	80	1	0	Ex-smoker	44.06	6.5	160
STEPHEN TACCHINI	PT326	Female	48	1	0	never	36.73	6.6	126
ANDREW LOGAN	PT339	Male	59	1	0	Ex-smoker	25.31	6	130

Result 3

Output

Action Output

#	Time	Action	Message
8	14:09:48	select * from diabetes_prediction where hypertension=1 except select * from diabetes_predic...	4340 row(s) returned

Suggest improvements in the database schema to reduce data redundancy and improve data integrity.

- Adding a table for the Patient's name, age, gender and other information , hence removing them from data table.
- Using primary keys and foreign keys for Patients, general data.
- Using views for simplifying queries.
- Setting up constraints such as unique , not null and check constraints.

Explain how you can optimize the performance of SQL queries on this dataset

- Ensuring the relevant columns used in WHERE clauses are indexed.
- Limit SELECT columns i.e. , retrieve only the needed columns rather than selecting all columns.
- Applying filter conditions as early as possible in the query to reduce the dataset size before performing complex operations.
- Writing simple queries and avoiding sub-queries.

THANKYOU