DB-LAB-TASK-3

Roll No: 24P-0706 **Dept: BS-CS**

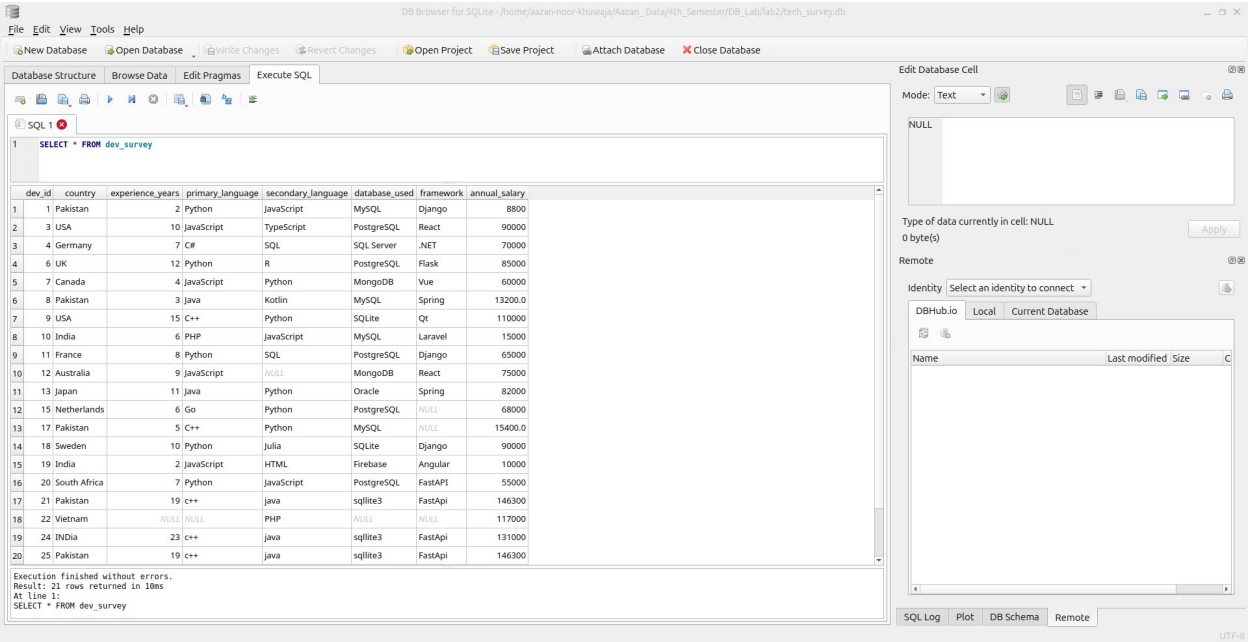
Name: Aazan Noor Khuwaja **Section : 4B**

1. Display all developer records:

Command:

```
SELECT * FROM dev_survey
```

Output:



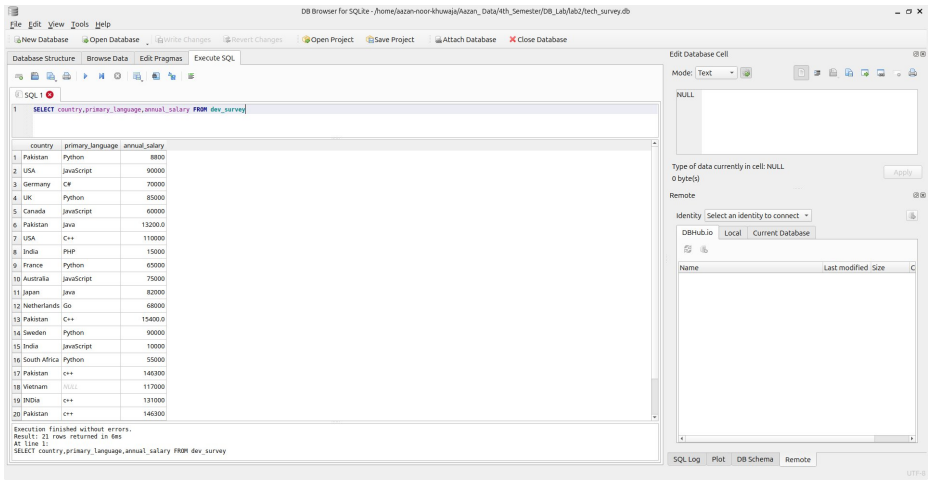
dev_id	country	experience_years	primary_language	secondary_language	database_used	framework	annual_salary
1	Pakistan	2	Python	JavaScript	MySQL	Django	8800
3	USA	10	JavaScript	TypeScript	PostgreSQL	React	90000
4	Germany	7	C#	SQL	SQL Server	.NET	70000
6	UK	12	Python	R	PostgreSQL	Flask	85000
7	Canada	4	JavaScript	Python	MongoDB	Vue	60000
8	Pakistan	3	Java	Kotlin	MySQL	Spring	13200.0
9	USA	15	C++	Python	SQLite	Qt	110000
10	India	6	PHP	JavaScript	MySQL	Laravel	15000
11	France	8	Python	SQL	PostgreSQL	Django	65000
12	Australia	9	JavaScript	NULL	MongoDB	React	75000
13	Japan	11	Java	Python	Oracle	Spring	82000
15	Netherlands	6	Go	Python	PostgreSQL	NULL	68000
17	Pakistan	5	C++	Python	MySQL	NULL	15400.0
18	Sweden	10	Python	Julia	SQLite	Django	90000
19	India	2	JavaScript	HTML	Firebase	Angular	10000
20	South Africa	7	Python	JavaScript	PostgreSQL	FastAPI	55000
21	Pakistan	19	c++	java	sqllite3	FastApi	146300
22	Vietnam	NULL	NULL	PHP	NULL	NULL	117000
24	INDia	23	c++	java	sqllite3	FastApi	131000
25	Pakistan	19	c++	java	sqllite3	FastApi	146300

2. Display only country, primary_language, annual_salary:

Command:

```
SELECT country,primary_language,annual_salary FROM dev_survey;
```

Output:

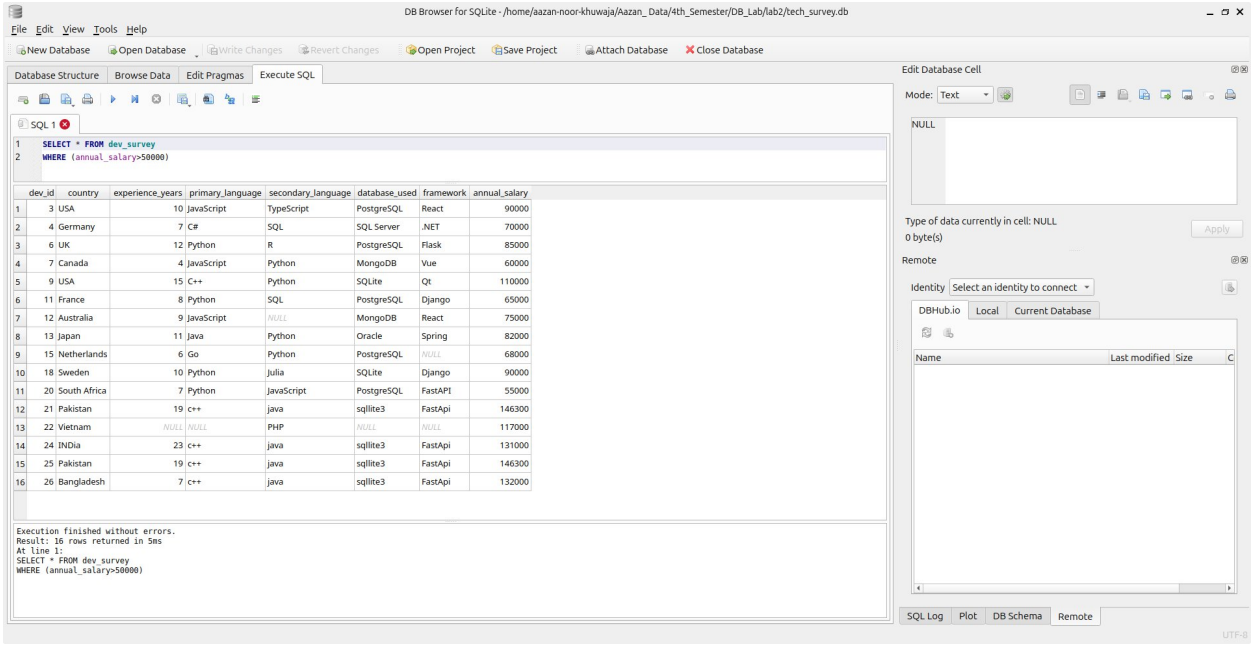


3. List developers earning more than 50,000 USD:

Command:

```
SELECT * FROM dev_survey
WHERE (annual_salary>50000);
```

Output:



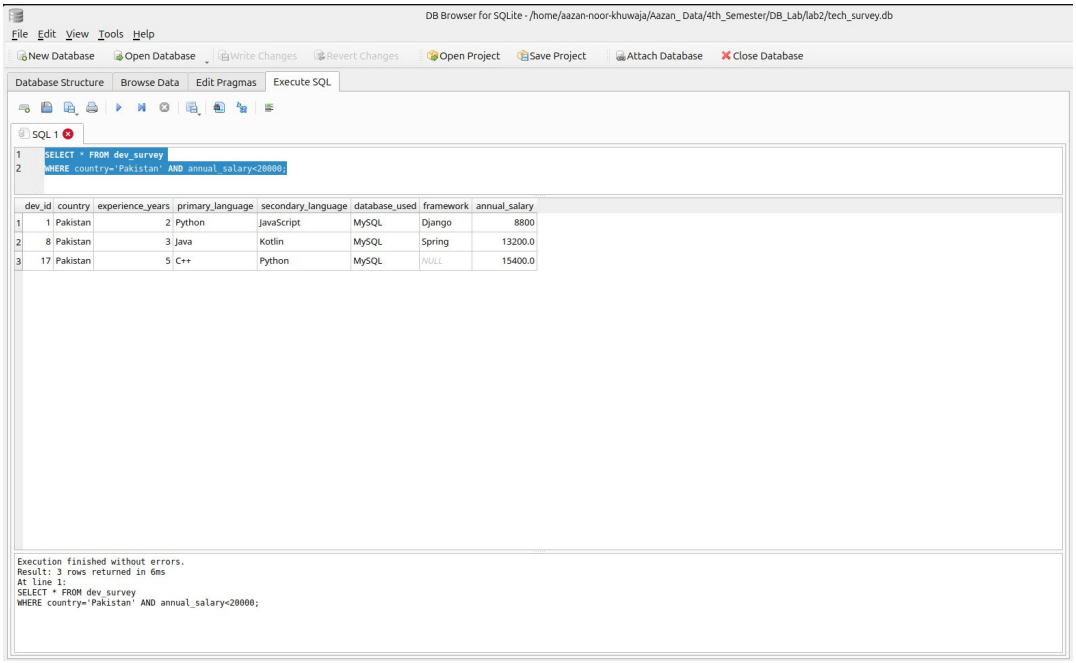
4. Show developers from Pakistan earning less than 20,000 USD:

Command:

SELECT * FROM dev_survey

WHERE country='Pakistan' AND annual_salary<20000;

Output:



5. Show developers who use Python and PostgreSQL:

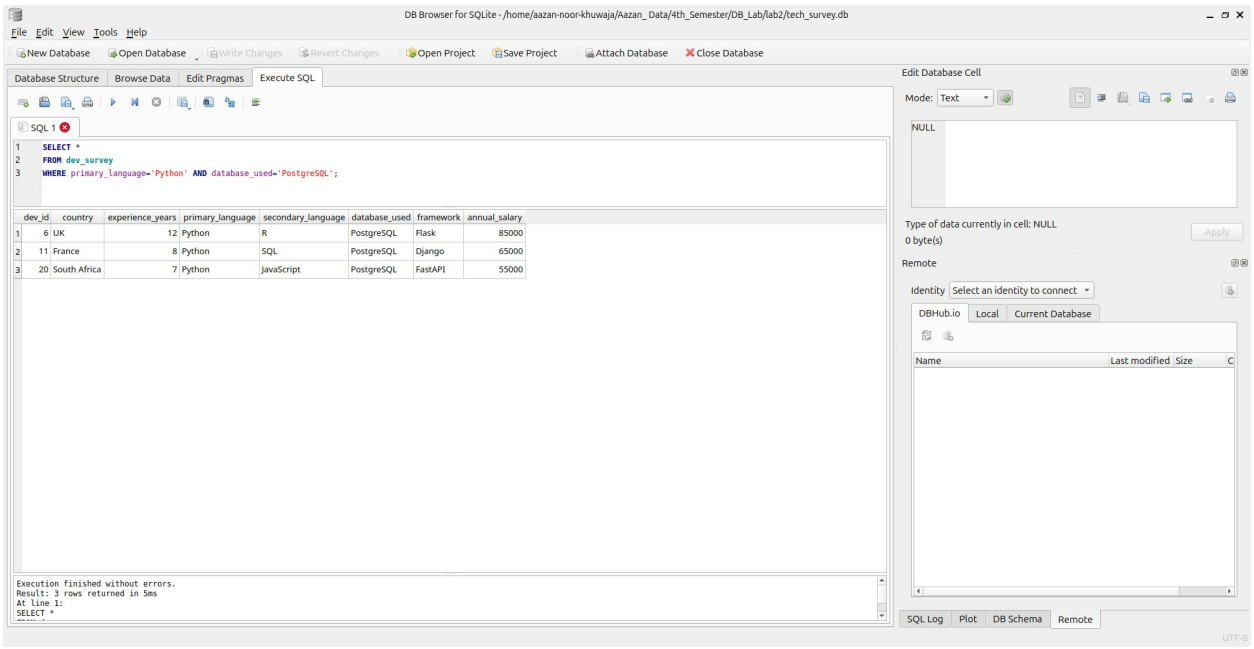
Command:

SELECT *

FROM dev_survey

WHERE primary_language = 'Python' AND database_used = 'PostgreSQL';

Output:

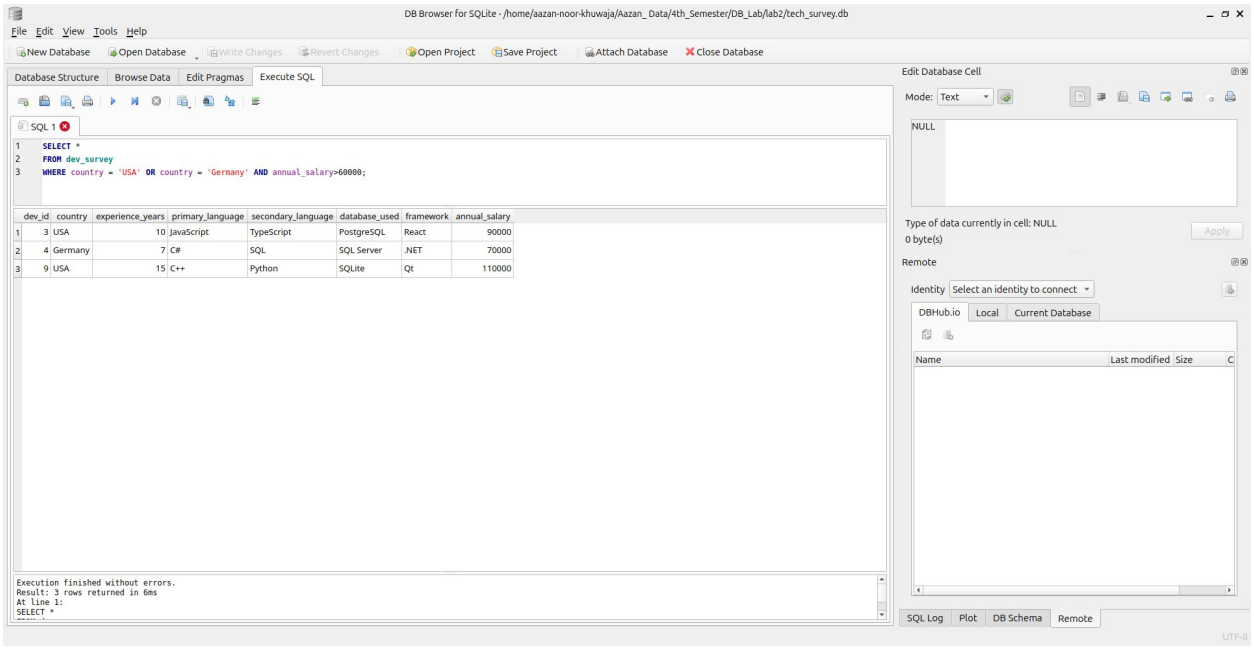


6. Show developers from USA or Germany earning above 60,000 USD:

Command:

```
SELECT *
FROM dev_survey
WHERE country = 'USA' OR country = 'Germany' AND annual_salary>60000;
```

Output:

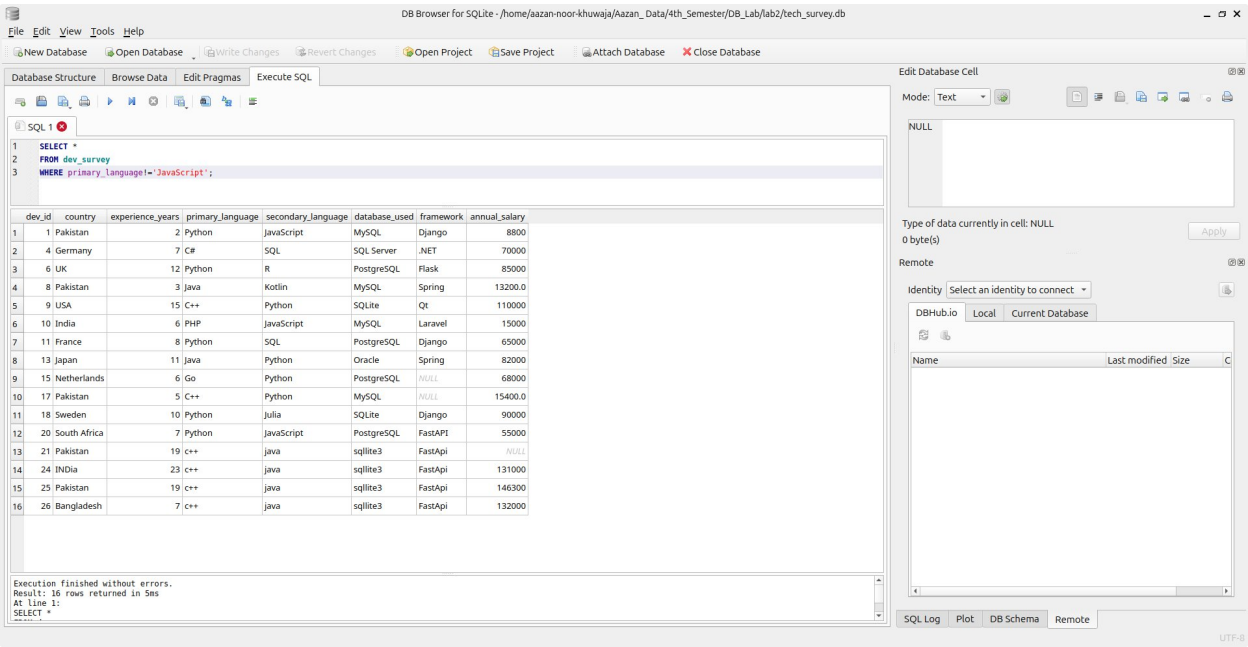


7. Show developers who do not use JavaScript:

Command:

```
SELECT *

FROM dev_survey

WHERE primary_language!='JavaScript';
```

Output:

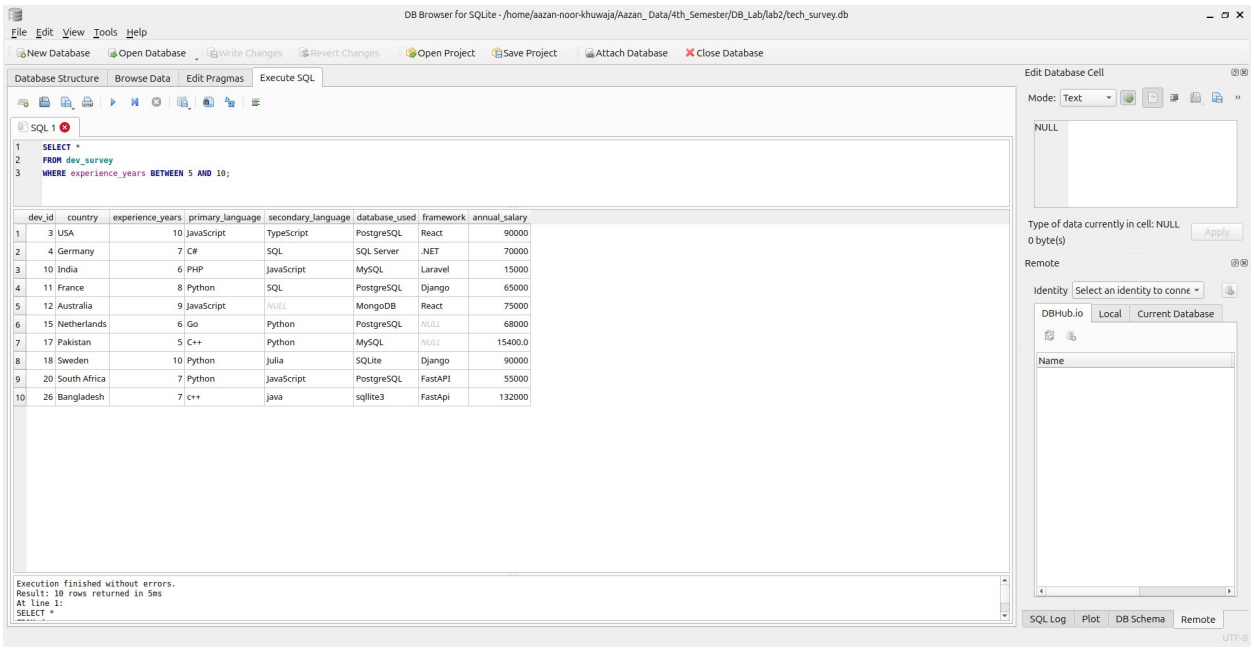


8. Show developers with experience between 5 and 10 years:

Command:

```
SELECT *

FROM dev_survey

WHERE experience_years BETWEEN 5 AND 10;
```

Output:

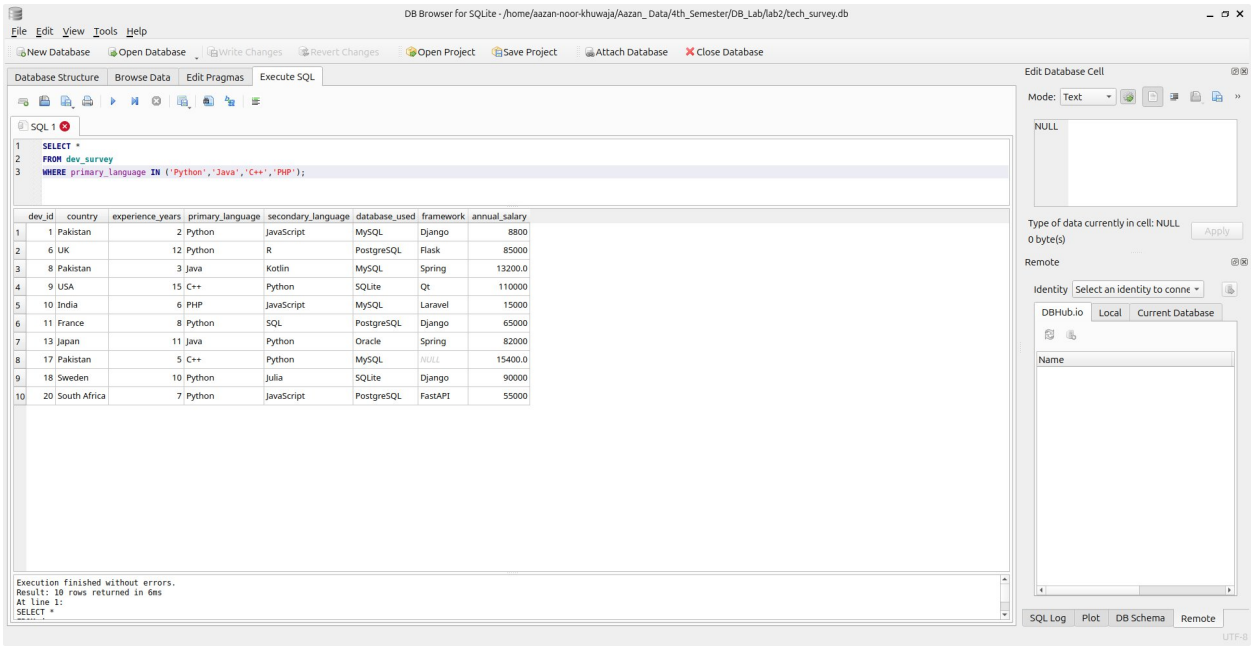


9. Show developers whose primary language is either one of Python, Java, C++,PHP:

Command:

```
SELECT *
FROM dev_survey
WHERE primary_language IN ('Python','Java','C++','PHP');
```

Output:

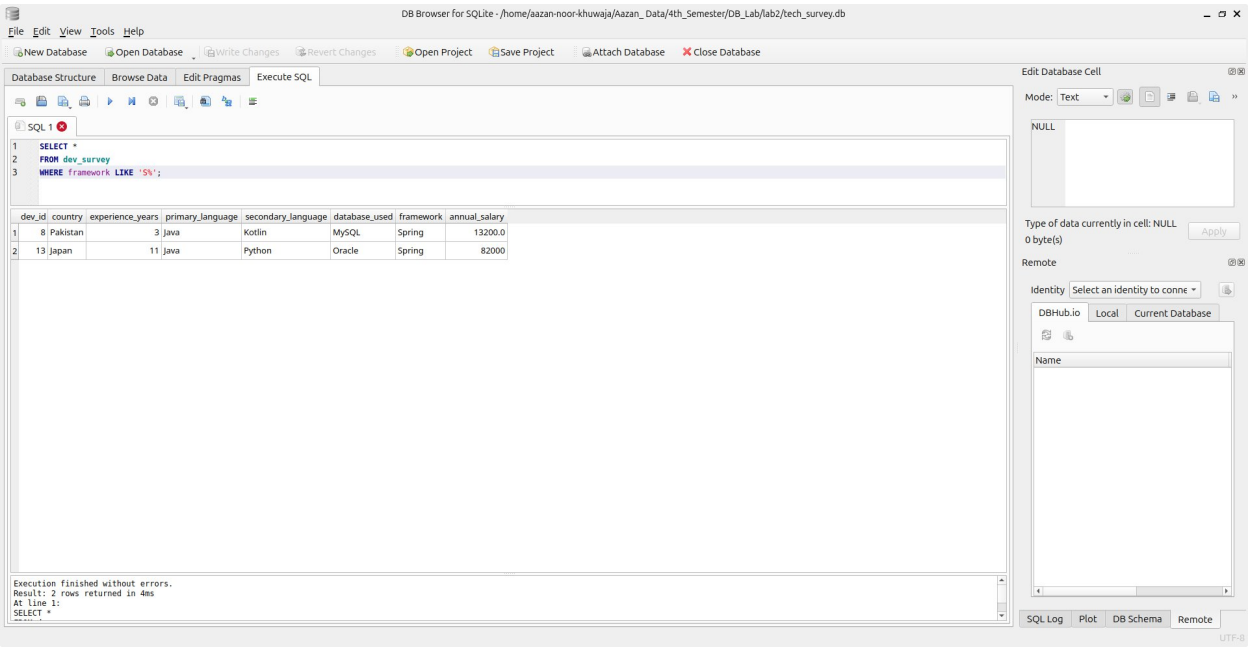


10. Show developers whose framework starts with S:

Command:

```
SELECT *

FROM dev_survey

WHERE framework LIKE 'S%';
```

Output:

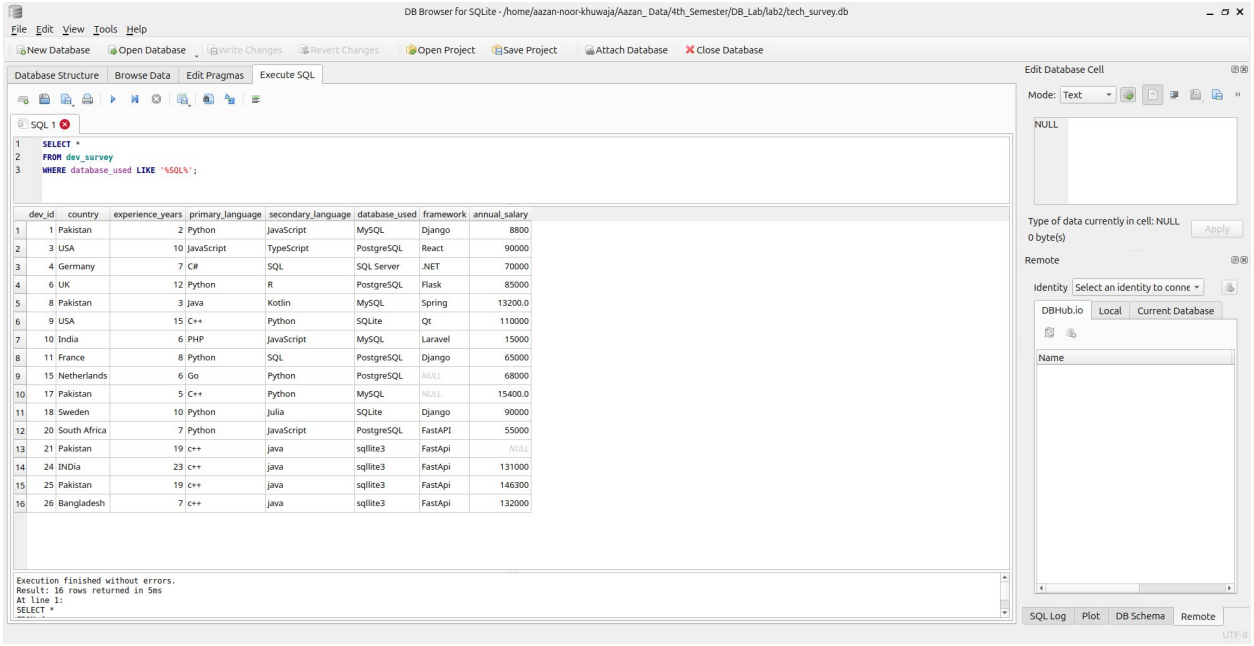


11. Show developers whose database contains the word SQL:

Command:

```
SELECT *

FROM dev_survey

WHERE database_used LIKE '%SQL%';
```

Output:

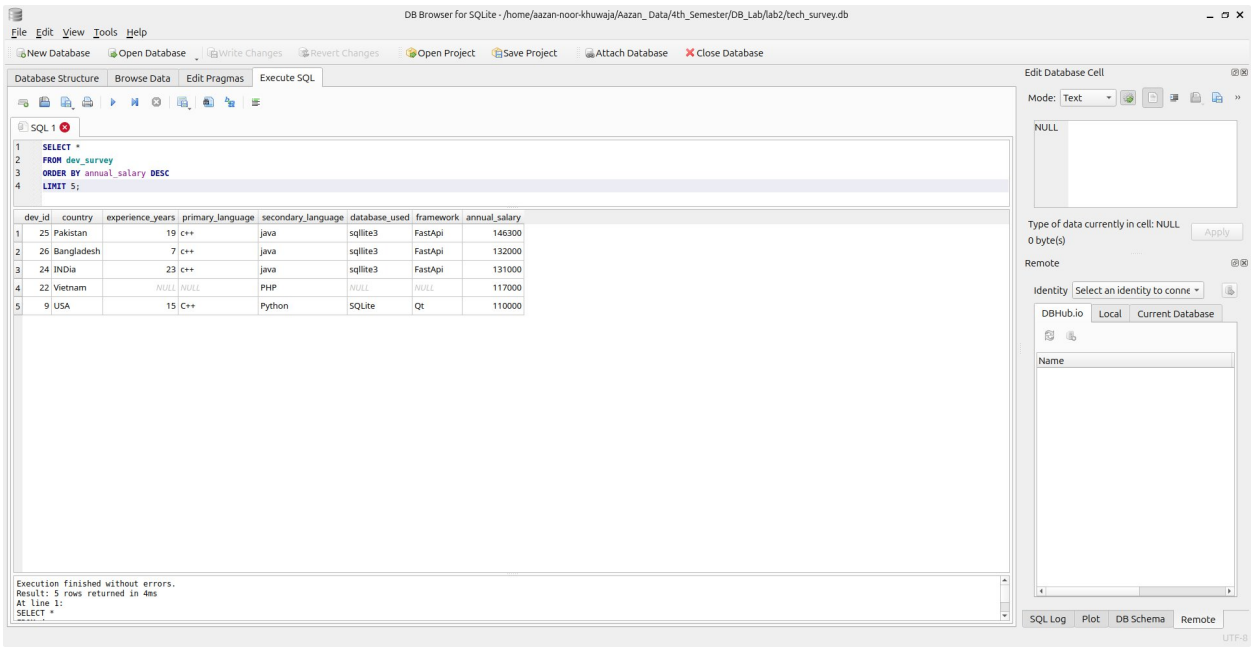


12. Show the top 5 highest-paid developers:

Command:

```
SELECT *

FROM dev_survey

ORDER BY annual_salary DESC

LIMIT 5;
```

Output:

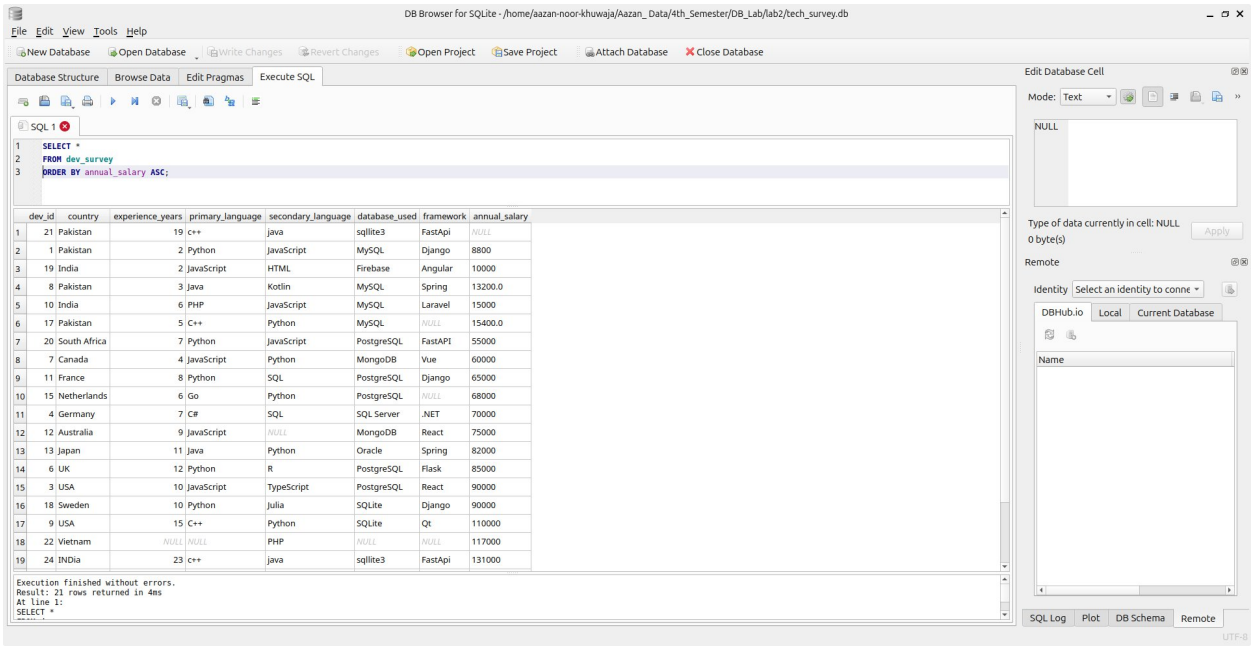


13. Show the lowest-paid developers sorted by salary:

Command:

```
SELECT *
FROM dev_survey
ORDER BY annual_salary ASC;
```

Output:

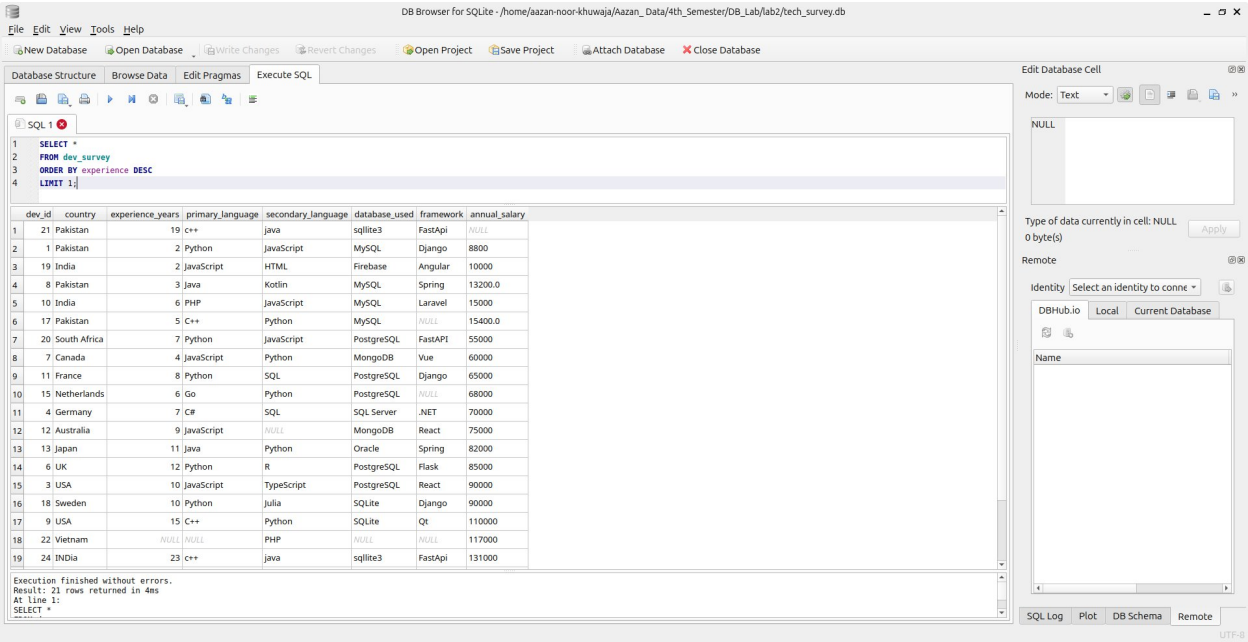


14. Show the only developer with the most experience:

Command:

```
SELECT *

FROM dev_survey

ORDER BY experience DESC

LIMIT 1;
```

Output:

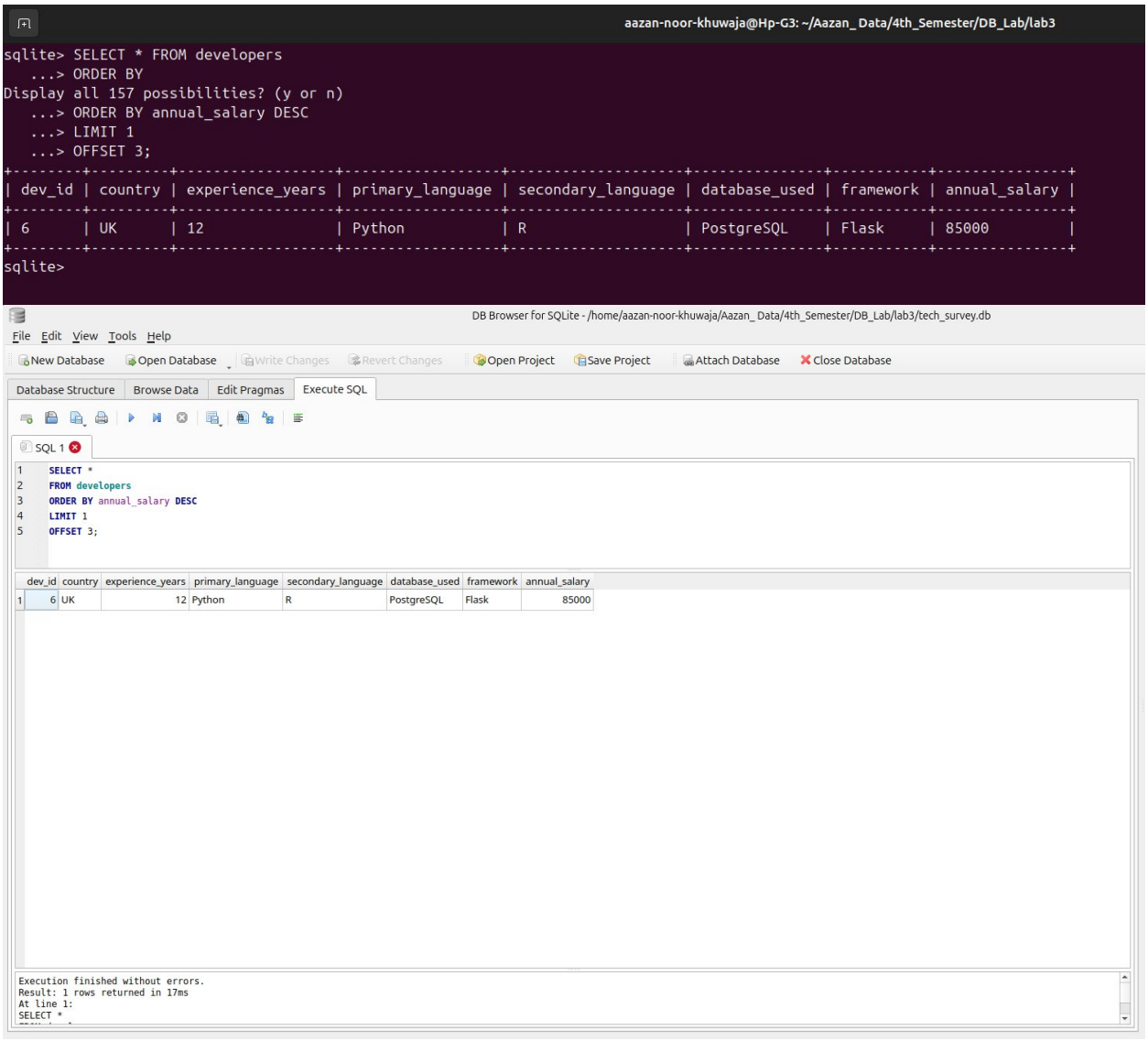


15. Show the developer with the 4th highest salary.

Command:

```
SELECT *

FROM developers

ORDER BY annual_salary DESC

LIMIT 1

OFFSET 3;
```

Output:



16. Show developers who use both primary and secondary languages.

Command:

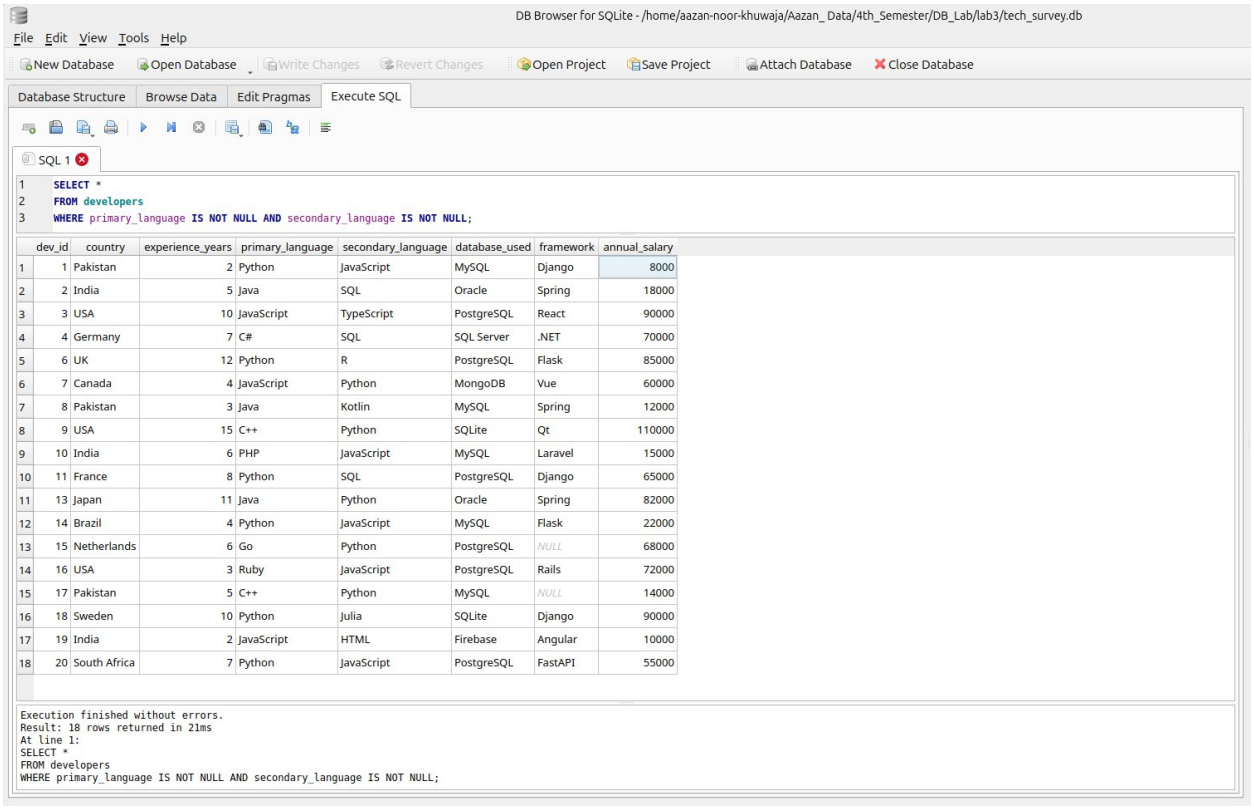
SELECT *

FROM developers

WHERE primary_language IS NOT NULL AND secondary_language IS NOT NULL;

Output:

```
aazan-noor-khuwaja@Hp-G3: ~/Aazan_ Data/4th_Semester/DB_Lab/lab3

sqlite> SELECT * FROM developers
   ...> WHERE primary_language IS NOT NULL AND secondary_language IS NOT NULL;
+--------+--------------+-----------------+------------------+--------------------+---------------+-----------+---------------+
| dev_id |   country    | experience_years | primary_language | secondary_language | database_used | framework | annual_salary |
+--------+--------------+-----------------+------------------+--------------------+---------------+-----------+---------------+
| 1      | Pakistan     | 2               | Python           | JavaScript         | MySQL         | Django    | 8000          |
| 2      | India        | 5               | Java             | SQL                | Oracle        | Spring    | 18000         |
| 3      | USA          | 10              | JavaScript       | TypeScript         | PostgreSQL    | React     | 90000         |
| 4      | Germany      | 7               | C#               | SQL                | SQL Server    | .NET      | 70000         |
| 6      | UK           | 12              | Python           | R                  | PostgreSQL    | Flask     | 85000         |
| 7      | Canada       | 4               | JavaScript       | Python             | MongoDB       | Vue       | 60000         |
| 8      | Pakistan     | 3               | Java             | Kotlin             | MySQL         | Spring    | 12000         |
| 9      | USA          | 15              | C++              | Python             | SQLite        | Qt        | 110000        |
| 10     | India        | 6               | PHP              | JavaScript         | MySQL         | Laravel   | 15000         |
| 11     | France       | 8               | Python           | SQL                | PostgreSQL    | Django    | 65000         |
| 13     | Japan        | 11              | Java             | Python             | Oracle        | Spring    | 82000         |
| 14     | Brazil       | 4               | Python           | JavaScript         | MySQL         | Flask     | 22000         |
| 15     | Netherlands  | 6               | Go               | Python             | PostgreSQL    |           | 68000         |
| 16     | USA          | 3               | Ruby             | JavaScript         | PostgreSQL    | Rails     | 72000         |
| 17     | Pakistan     | 5               | C++              | Python             | MySQL         |           | 14000         |
| 18     | Sweden       | 10              | Python           | Julia              | SQLite        | Django    | 90000         |
| 19     | India        | 2               | JavaScript       | HTML               | Firebase      | Angular   | 10000         |
| 20     | South Africa | 7               | Python           | JavaScript         | PostgreSQL    | FastAPI   | 55000         |
+--------+--------------+-----------------+------------------+--------------------+---------------+-----------+---------------+
sqlite>
```



	dev_id	country	experience_years	primary_language	secondary_language	database_used	framework	annual_salary
1	1	Pakistan	2	Python	JavaScript	MySQL	Django	8000
2	2	India	5	Java	SQL	Oracle	Spring	18000
3	3	USA	10	JavaScript	TypeScript	PostgreSQL	React	90000
4	4	Germany	7	C#	SQL	SQL Server	.NET	70000
5	6	UK	12	Python	R	PostgreSQL	Flask	85000
6	7	Canada	4	JavaScript	Python	MongoDB	Vue	60000
7	8	Pakistan	3	Java	Kotlin	MySQL	Spring	12000
8	9	USA	15	C++	Python	SQLite	Qt	110000
9	10	India	6	PHP	JavaScript	MySQL	Laravel	15000
10	11	France	8	Python	SQL	PostgreSQL	Django	65000
11	13	Japan	11	Java	Python	Oracle	Spring	82000
12	14	Brazil	4	Python	JavaScript	MySQL	Flask	22000
13	15	Netherlands	6	Go	Python	PostgreSQL	NULL	68000
14	16	USA	3	Ruby	JavaScript	PostgreSQL	Rails	72000
15	17	Pakistan	5	C++	Python	MySQL	NULL	14000
16	18	Sweden	10	Python	Julia	SQLite	Django	90000
17	19	India	2	JavaScript	HTML	Firebase	Angular	10000
18	20	South Africa	7	Python	JavaScript	PostgreSQL	FastAPI	55000

17. Show developers where salary information is not provided.

Command:

SELECT *

FROM developers

WHERE annual_salary IS NULL;

Output:

```
aazan-noor-khuwaja@Hp-G3: ~/Aazan_ Data/4th_Semester/DB_Lab/lab3
sqlite> SELECT * FROM developers
   ...> WHERE annual_salary IS NULL;
+--------+---------+-----------------+-----------------+-------------------+---------------+-----------+---------------+
| dev_id | country | experience_years | primary_language | secondary_language | database_used | framework | annual_salary |
+--------+---------+-----------------+-----------------+-------------------+---------------+-----------+---------------+
| 5      | Pakistan | 1               | C               |                   |               |           |               |
+--------+---------+-----------------+-----------------+-------------------+---------------+-----------+---------------+
sqlite>
```

DB Browser for SQLite - /home/aazan

File Edit View Tools Help

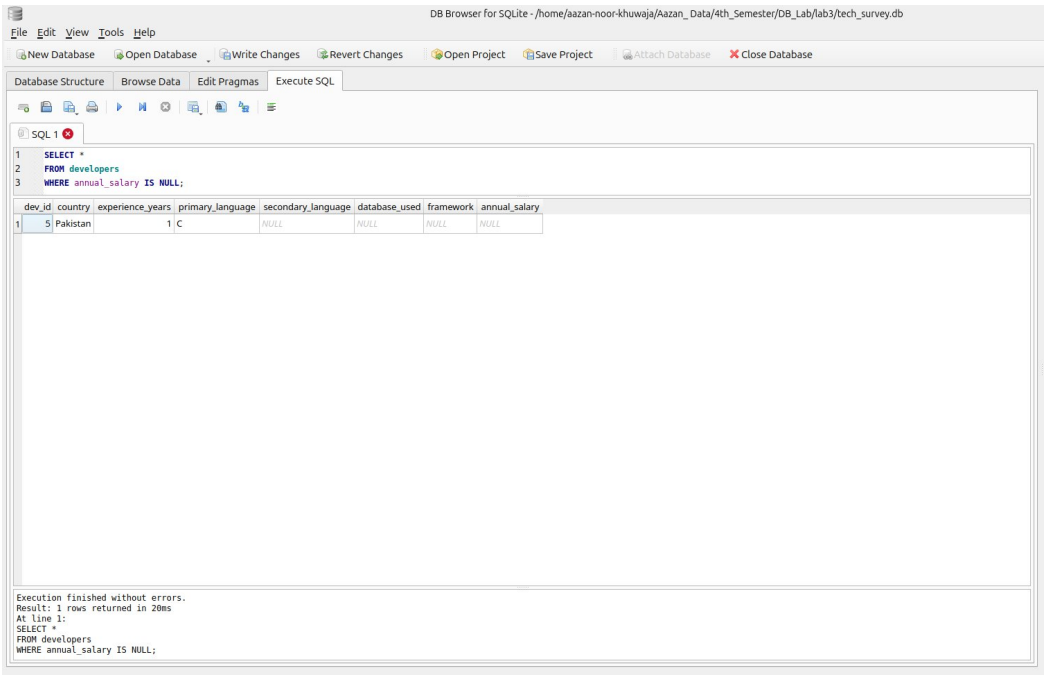
New Database | Open Database | Write Changes | Revert Changes | Open Project | Save Project

Database Structure | Browse Data | Edit Pragmas | Execute SQL

Table: developers | Filter in any column

	dev_id	country	experience_years	primary_language	secondary_language	database_used	framework	annual_salary
	Filter	Filter	Filter	Filter	Filter	Filter	Filter	Filter
1	1	Pakistan	2	Python	JavaScript	MySQL	Django	8000
2	2	India	5	Java	SQL	Oracle	Spring	18000
3	3	USA	10	JavaScript	TypeScript	PostgreSQL	React	90000
4	4	Germany	7	C#	SQL	SQL Server	.NET	70000
5	5	Pakistan	1	C	*NULL*	*NULL*	*NULL*	*NULL*
6	6	UK	12	Python	R	PostgreSQL	Flask	85000
7	7	Canada	4	JavaScript	Python	MongoDB	Vue	60000
8	8	Pakistan	3	Java	Kotlin	MySQL	Spring	12000
9	9	USA	15	C++	Python	SQLite	Qt	110000
10	10	India	6	PHP	JavaScript	MySQL	Laravel	15000
11	11	France	8	Python	SQL	PostgreSQL	Django	65000
12	12	Australia	9	JavaScript	*NULL*	MongoDB	React	75000
13	13	Japan	11	Java	Python	Oracle	Spring	82000
14	14	Brazil	4	Python	JavaScript	MySQL	Flask	22000
15	15	Netherlands	6	Go	Python	PostgreSQL	*NULL*	68000
16	16	USA	3	Ruby	JavaScript	PostgreSQL	Rails	72000
17	17	Pakistan	5	C++	Python	MySQL	*NULL*	14000
18	18	Sweden	10	Python	Julia	SQLite	Django	90000
19	19	India	2	JavaScript	HTML	Firebase	Angular	10000
20	20	South Africa	7	Python	JavaScript	PostgreSQL	FastAPI	55000

Figure 1 There was no null in annual salary so for that i added one with null to show some output .



18. For each country (ordered alphabetically), rank developers from highest to lowest salary.

Command:

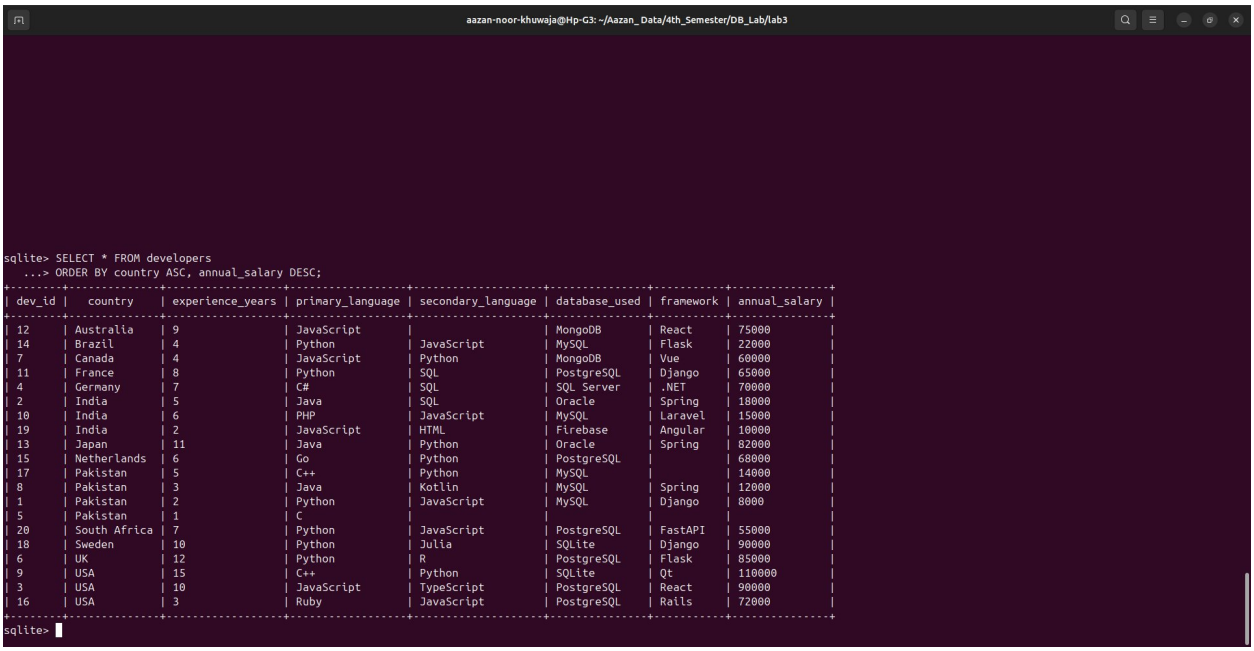
SELECT *

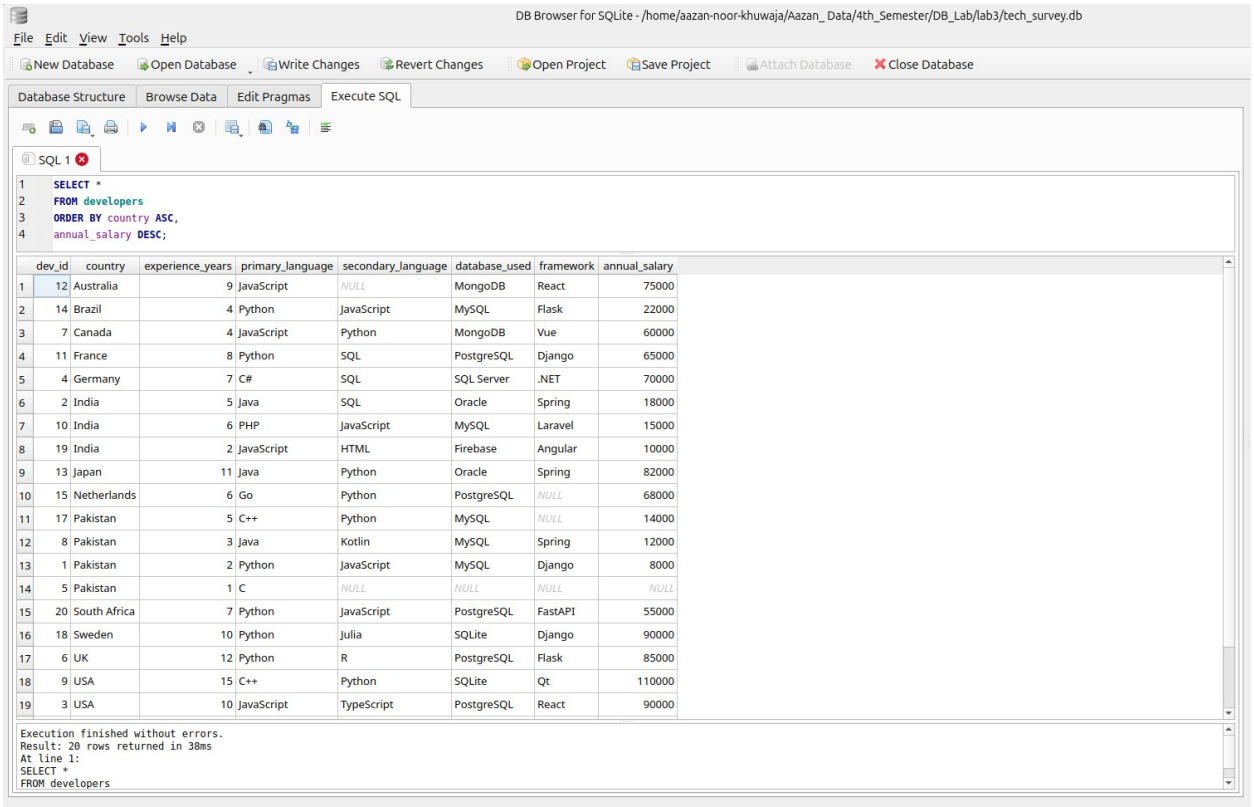
FROM developers

ORDER BY country ASC,

annual_salary DESC;

Output:





	dev_id	country	experience_years	primary_language	secondary_language	database_used	framework	annual_salary
1	12	Australia	9	JavaScript	NULL	MongoDB	React	75000
2	14	Brazil	4	Python	JavaScript	MySQL	Flask	22000
3	7	Canada	4	JavaScript	Python	MongoDB	Vue	60000
4	11	France	8	Python	SQL	PostgreSQL	Django	65000
5	4	Germany	7	C#	SQL	SQL Server	.NET	70000
6	2	India	5	Java	SQL	Oracle	Spring	18000
7	10	India	6	PHP	JavaScript	MySQL	Laravel	15000
8	19	India	2	JavaScript	HTML	Firebase	Angular	10000
9	13	Japan	11	Java	Python	Oracle	Spring	82000
10	15	Netherlands	6	Go	Python	PostgreSQL	NULL	68000
11	17	Pakistan	5	C++	Python	MySQL	NULL	14000
12	8	Pakistan	3	Java	Kotlin	MySQL	Spring	12000
13	1	Pakistan	2	Python	JavaScript	MySQL	Django	8000
14	5	Pakistan	1	C	NULL	NULL	NULL	NULL
15	20	South Africa	7	Python	JavaScript	PostgreSQL	FastAPI	55000
16	18	Sweden	10	Python	Julia	SQLite	Django	90000
17	6	UK	12	Python	R	PostgreSQL	Flask	85000
18	9	USA	15	C++	Python	SQLite	Qt	110000
19	3	USA	10	JavaScript	TypeScript	PostgreSQL	React	90000

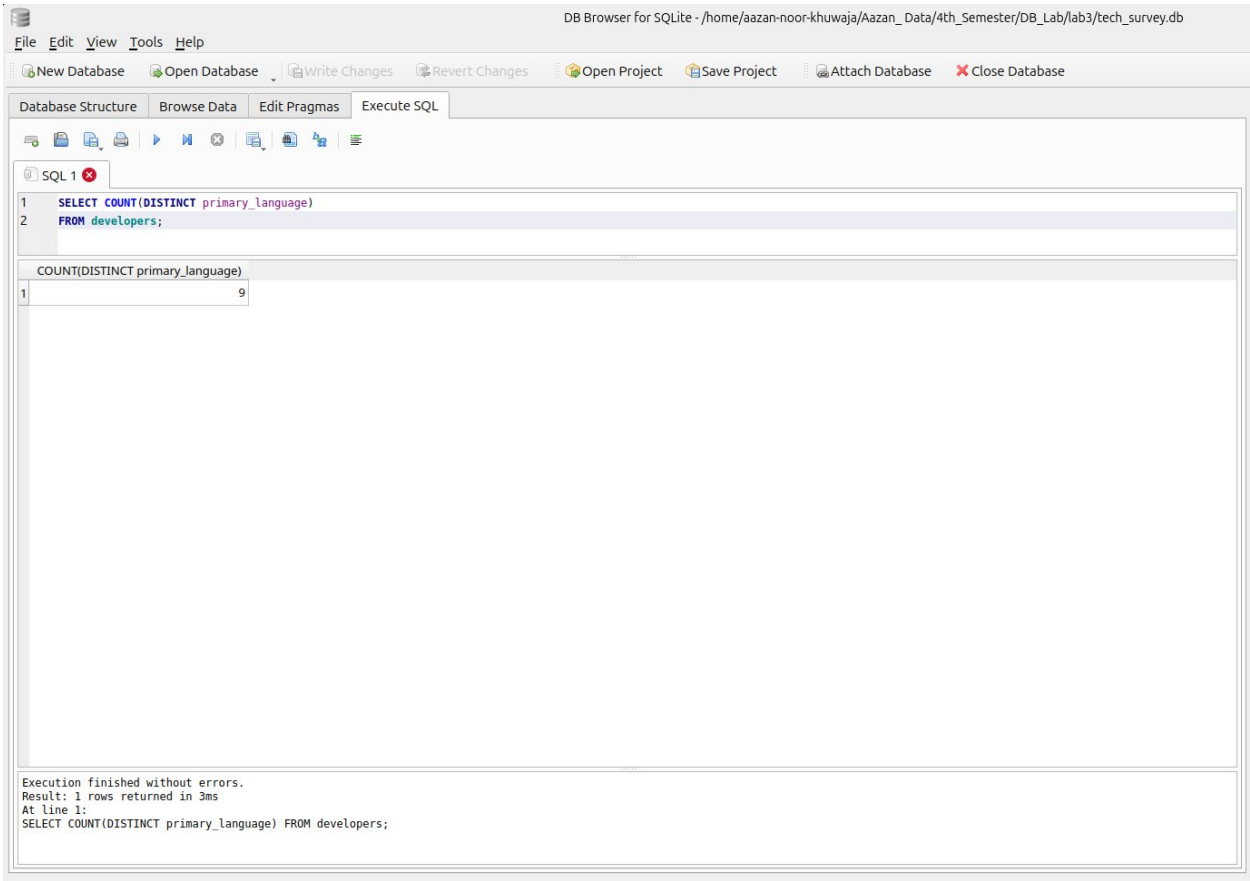
19. Display the total number of unique primary programming languages used by all developers.

Command:

SELECT COUNT(DISTINCT primary_language)

FROM developers;

Output:



20. Display developers ranked 6th to 10th by salary, where rank 1 corresponds to the highest

salary overall.

Command:

SELECT *

FROM developers

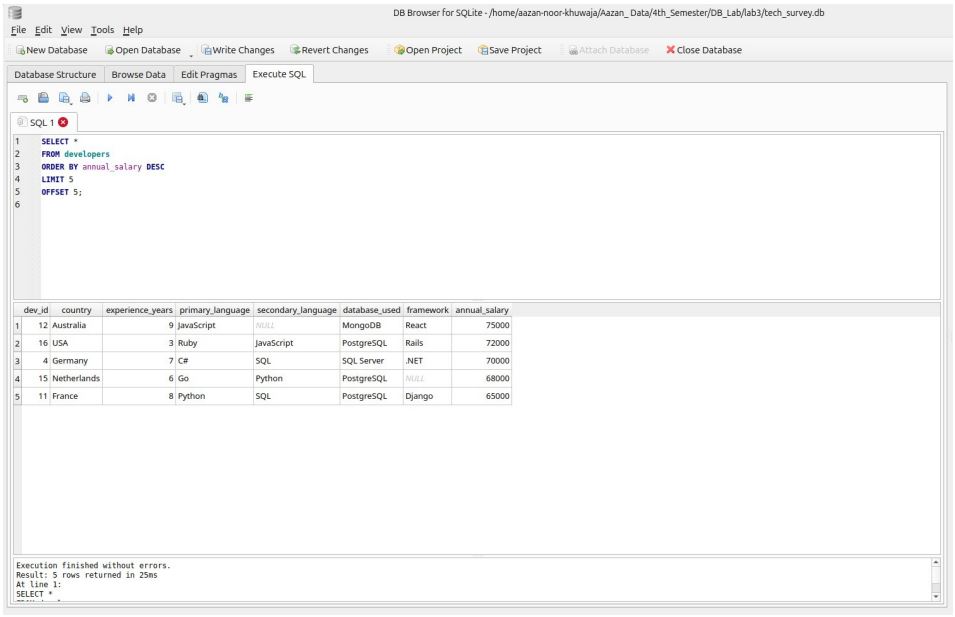
ORDER BY annual_salary DESC

LIMIT 5

OFFSET 5;

Output:

```
sqlite> SELECT * FROM developers
   ...> ORDER BY annual_salary DESC
   ...> LIMIT 5
   ...> OFFSET 5;
+--------+-------------+------------------+------------------+--------------------+--------------+-----------+---------------+
| dev_id |   country   | experience_years | primary_language | secondary_language | database_used | framework | annual_salary |
+--------+-------------+------------------+------------------+--------------------+--------------+-----------+---------------+
| 12     | Australia   | 9                | JavaScript       |                    | MongoDB      | React     | 75000         |
| 16     | USA         | 3                | Ruby             | JavaScript         | PostgreSQL   | Rails     | 72000         |
| 4      | Germany     | 7                | C#               | SQL                | SQL Server   | .NET      | 70000         |
| 15     | Netherlands | 6                | Go               | Python             | PostgreSQL   |           | 68000         |
| 11     | France      | 8                | Python           | SQL                | PostgreSQL   | Django    | 65000         |
+--------+-------------+------------------+------------------+--------------------+--------------+-----------+---------------+
sqlite>
```



21. Display the average annual salary of developers whose primary programming language is Java and whose database is Oracle.

Command:

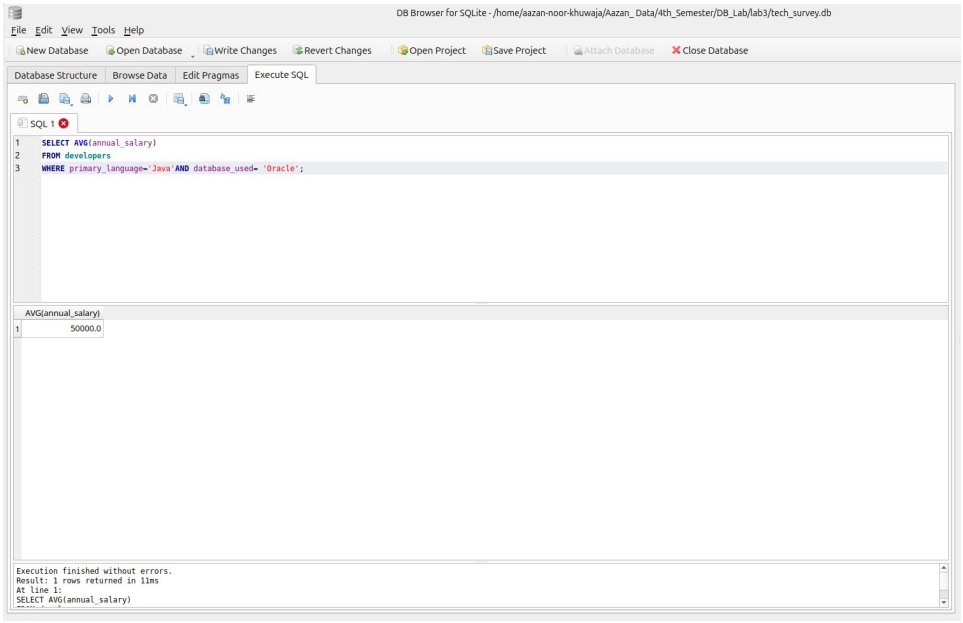
SELECT AVG(annual_salary)

FROM developers

WHERE primary_language='Java' AND database_used= 'Oracle';

Output:

```
sqlite> SELECT AVG(annual_salary) FROM developers
   ...> WHERE primary_language = 'Java' AND secondary_language = 'Oracle';
+-------------------+
| AVG(annual_salary) |
+-------------------+
|                   |
+-------------------+
sqlite> SELECT AVG(annual_salary) FROM developers
   ...> WHERE primary_language='Java' AND database_used= 'Oracle';
+-------------------+
| AVG(annual_salary) |
+-------------------+
| 50000.0           |
+-------------------+
sqlite>
```



22. Display a new calculated column named bonus, where the bonus is computed for each developer as : bonus = annual_salary + (1000 × experience_years).

Command:

SELECT *,annual_salary+(1000*experience_years) AS bonus

FROM developers;

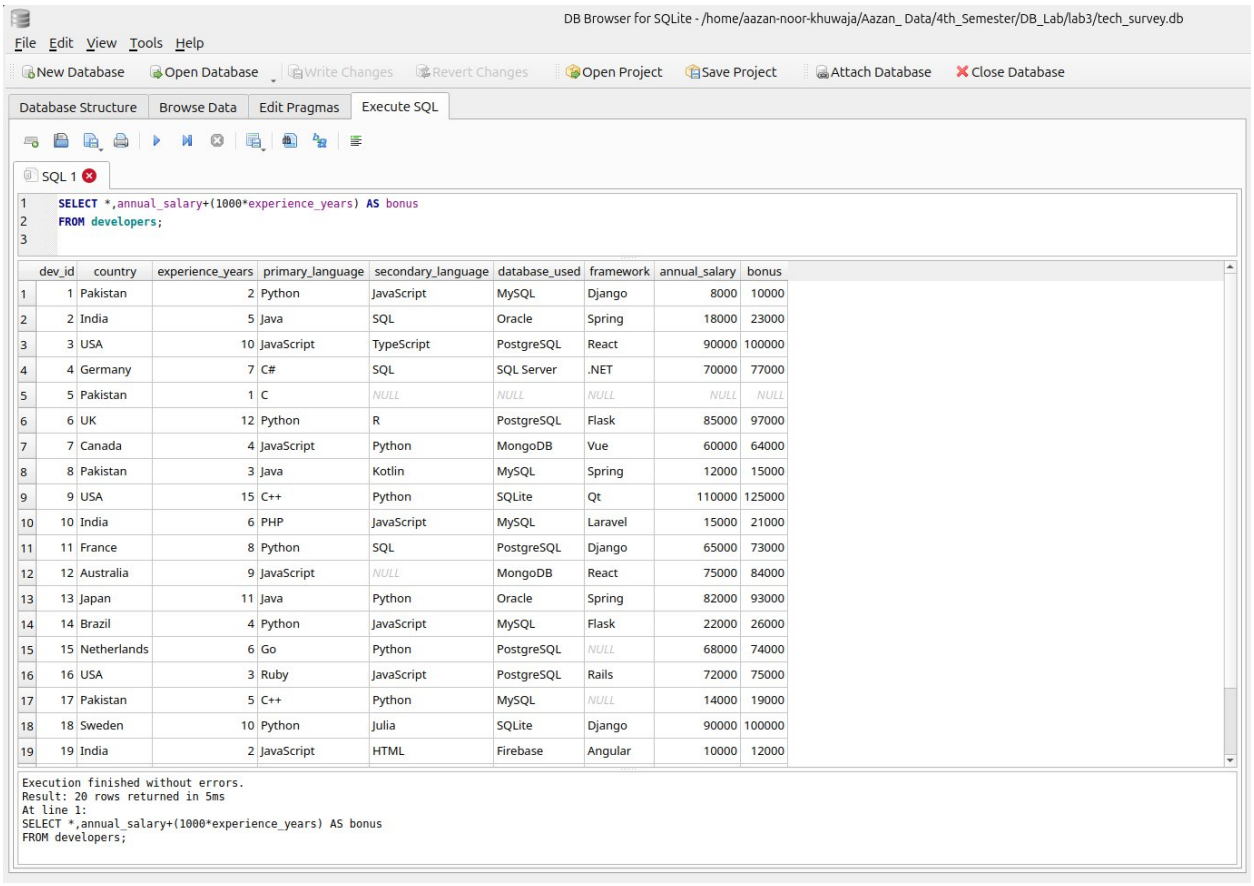
Output:

aazan-noor-khuwaja@Hp-G3: ~/Aazan_ Data/4th_Semester/DB_Lab/lab3

```
  SELECT *,annual_salary(1000*experience_years) AS bonus FROM developers  ;
           ^--- error here
sqlite> SELECT * , annual_salary(1000*experience_years) AS bonus
   ...> FROM developers
   ...> ;
Parse error: no such function: annual_salary
  SELECT * , annual_salary(1000*experience_years) AS bonus FROM developers  ;
             ^--- error here
sqlite> SELECT *
   ...> annual_salary+(1000 * experience_years) AS bonus
   ...> FROM developers ;
Parse error: near "annual_salary": syntax error
  SELECT * annual_salary+(1000 * experience_years) AS bonus FROM developers ;
           ^--- error here
sqlite> SELECT *
   ...> , annual_salary+(1000 * experience_years) AS bonus
   ...> FROM developers ;
```

dev_id	country	experience_years	primary_language	secondary_language	database_used	framework	annual_salary	bonus
1	Pakistan	2	Python	JavaScript	MySQL	Django	8000	10000
2	India	5	Java	SQL	Oracle	Spring	18000	23000
3	USA	10	JavaScript	TypeScript	PostgreSQL	React	90000	100000
4	Germany	7	C#	SQL	SQL Server	.NET	70000	77000
5	Pakistan	1	C					
6	UK	12	Python	R	PostgreSQL	Flask	85000	97000
7	Canada	4	JavaScript	Python	MongoDB	Vue	60000	64000
8	Pakistan	3	Java	Kotlin	MySQL	Spring	12000	15000
9	USA	15	C++	Python	SQLite	Qt	110000	125000
10	India	6	PHP	JavaScript	MySQL	Laravel	15000	21000
11	France	8	Python	SQL	PostgreSQL	Django	65000	73000
12	Australia	9	JavaScript		MongoDB	React	75000	84000
13	Japan	11	Java	Python	Oracle	Spring	82000	93000
14	Brazil	4	Python	JavaScript	MySQL	Flask	22000	26000
15	Netherlands	6	Go	Python	PostgreSQL		68000	74000
16	USA	3	Ruby	JavaScript	PostgreSQL	Rails	72000	75000
17	Pakistan	5	C++	Python	MySQL		14000	19000
18	Sweden	10	Python	Julia	SQLite	Django	90000	100000
19	India	2	JavaScript	HTML	Firebase	Angular	10000	12000
20	South Africa	7	Python	JavaScript	PostgreSQL	FastAPI	55000	62000

```
sqlite>
```



	dev_id	country	experience_years	primary_language	secondary_language	database_used	framework	annual_salary	bonus
1	1	Pakistan	2	Python	JavaScript	MySQL	Django	8000	10000
2	2	India	5	Java	SQL	Oracle	Spring	18000	23000
3	3	USA	10	JavaScript	TypeScript	PostgreSQL	React	90000	100000
4	4	Germany	7	C#	SQL	SQL Server	.NET	70000	77000
5	5	Pakistan	1	C	NULL	NULL	NULL	NULL	NULL
6	6	UK	12	Python	R	PostgreSQL	Flask	85000	97000
7	7	Canada	4	JavaScript	Python	MongoDB	Vue	60000	64000
8	8	Pakistan	3	Java	Kotlin	MySQL	Spring	12000	15000
9	9	USA	15	C++	Python	SQLite	Qt	110000	125000
10	10	India	6	PHP	JavaScript	MySQL	Laravel	15000	21000
11	11	France	8	Python	SQL	PostgreSQL	Django	65000	73000
12	12	Australia	9	JavaScript	NULL	MongoDB	React	75000	84000
13	13	Japan	11	Java	Python	Oracle	Spring	82000	93000
14	14	Brazil	4	Python	JavaScript	MySQL	Flask	22000	26000
15	15	Netherlands	6	Go	Python	PostgreSQL	NULL	68000	74000
16	16	USA	3	Ruby	JavaScript	PostgreSQL	Rails	72000	75000
17	17	Pakistan	5	C++	Python	MySQL	NULL	14000	19000
18	18	Sweden	10	Python	Julia	SQLite	Django	90000	100000
19	19	India	2	JavaScript	HTML	Firebase	Angular	10000	12000