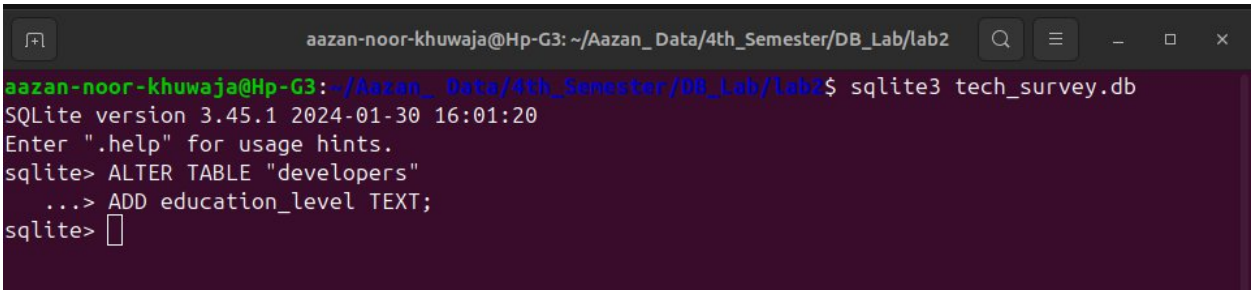
DB-LAB-TASK-2

Roll No: 24P-0706 **Dept: BS-CS**
Name: Aazan Noor Khuwaja **Section : 4B**

ALTER TABLE PART:

1. **Add a column education_level:**

Command Input:

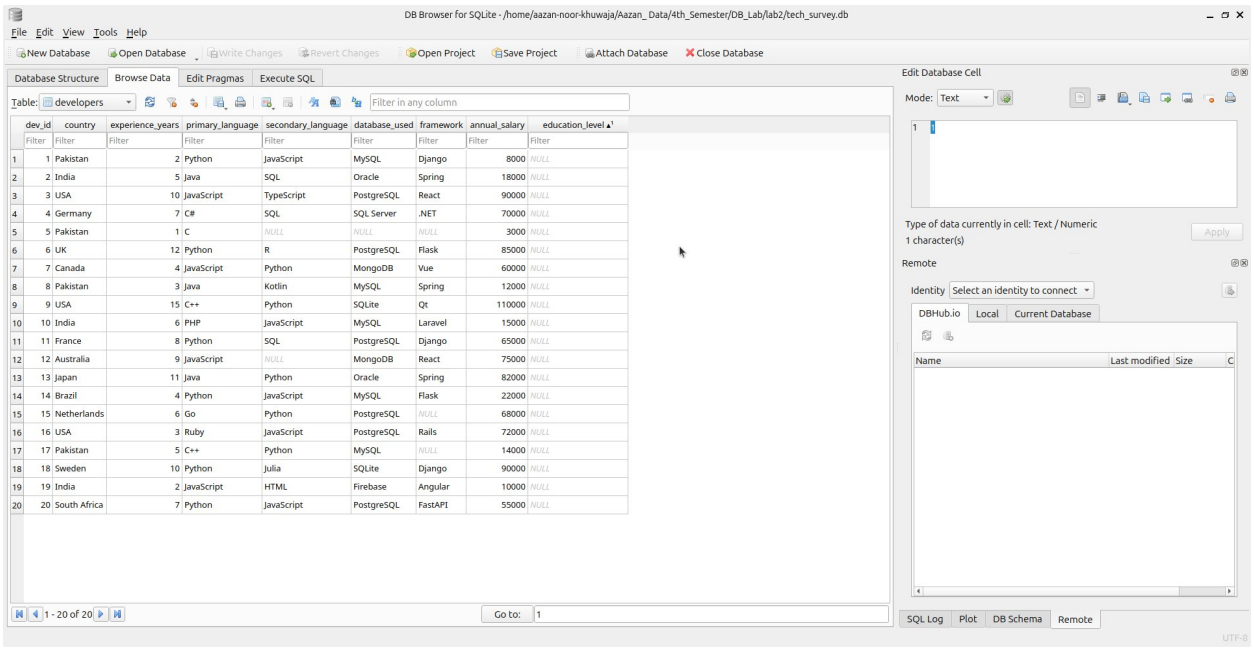


Command:

ALTER TABLE “developers”

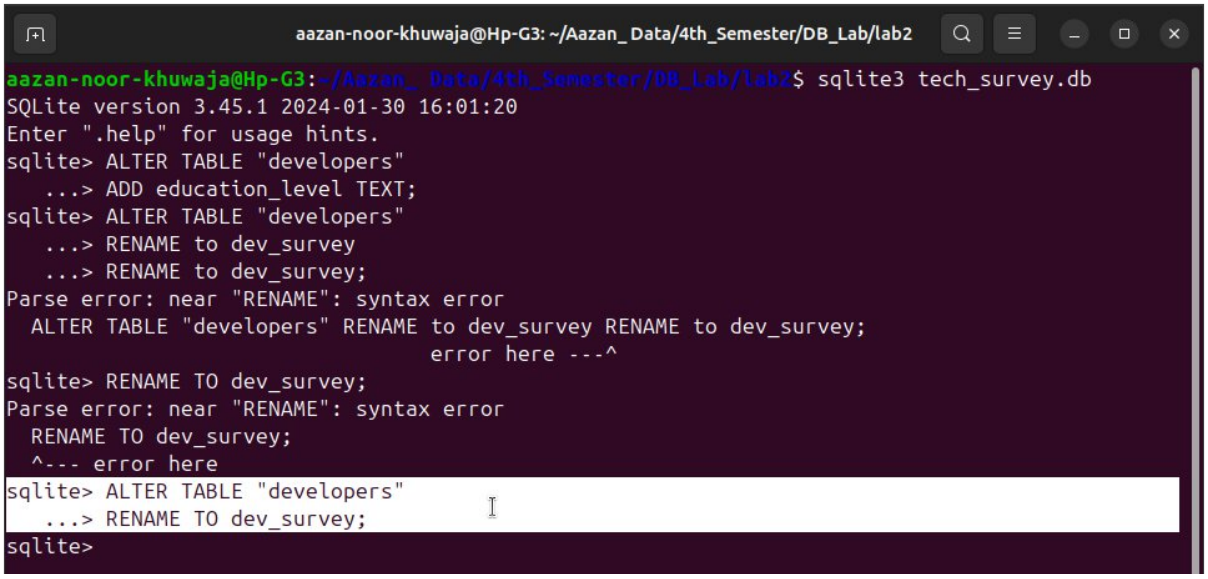
ADD education_level TEXT;

Output:



2. **Rename table developers to dev_survey:**

Command Input:

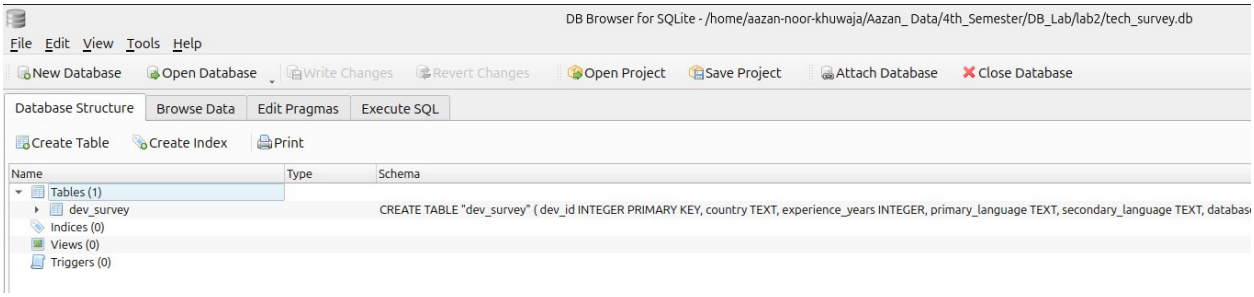


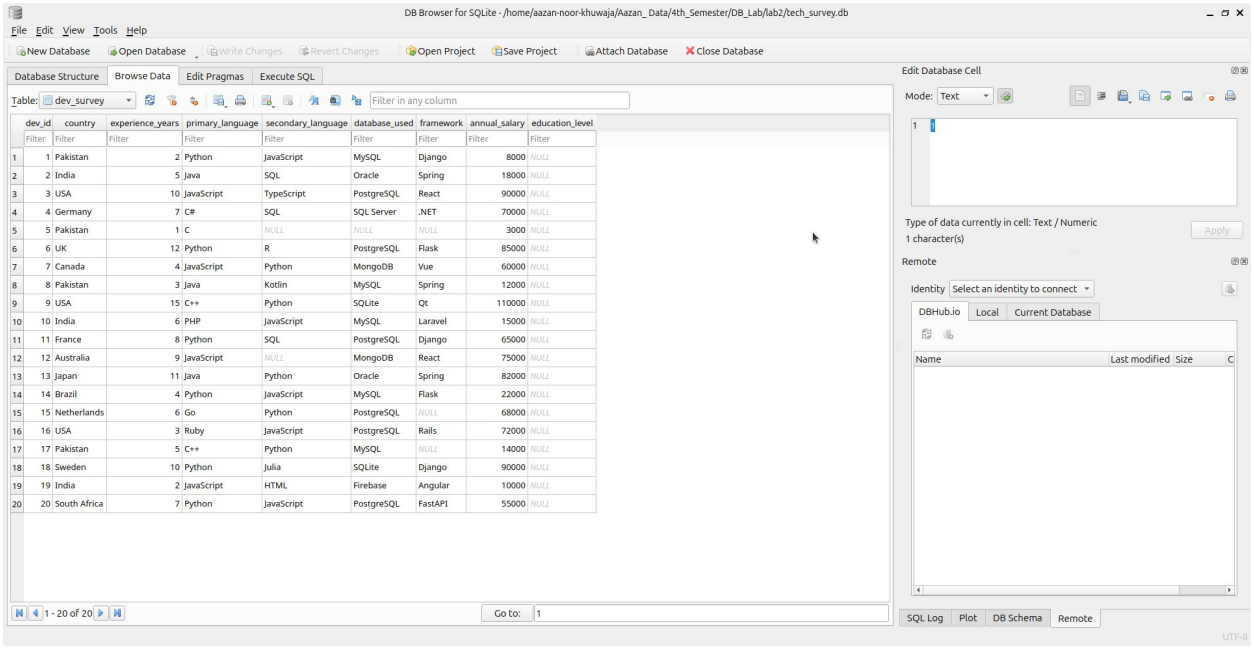
Command:

ALTER TABLE "developers"

RENAME TO dev_survey;

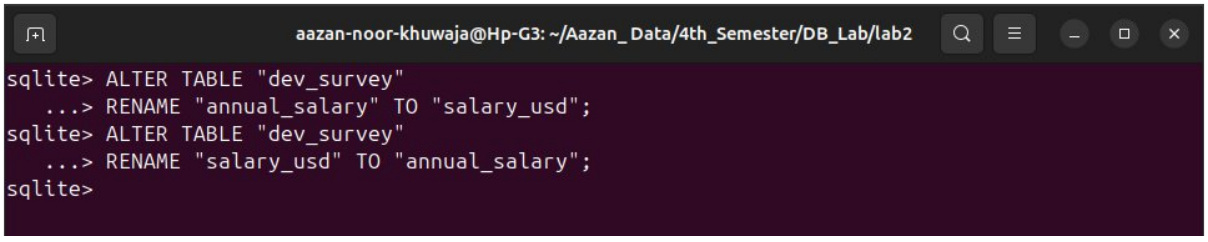
Output:





3. Rename column salary_usd to annual_salary:

Command Input:



Command:

```
ALTER TABLE "dev_survey"
```

```
RENAME "salary_usd" TO "annual_salary";
```

Output:

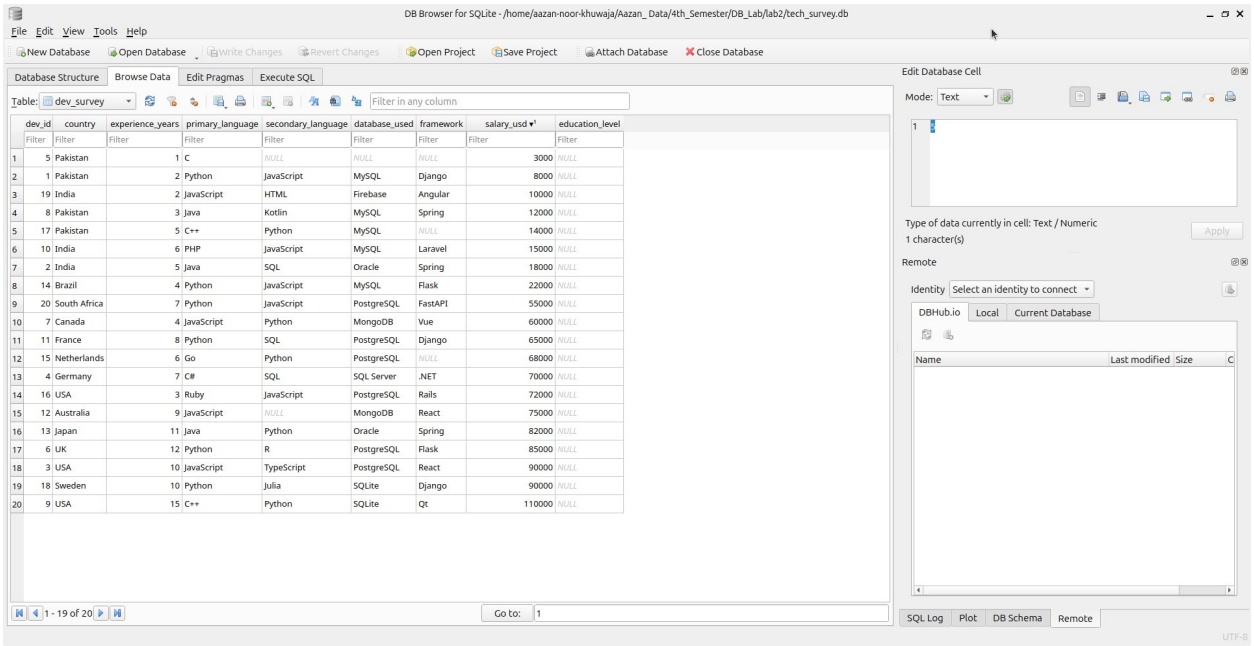


Figure 1 before

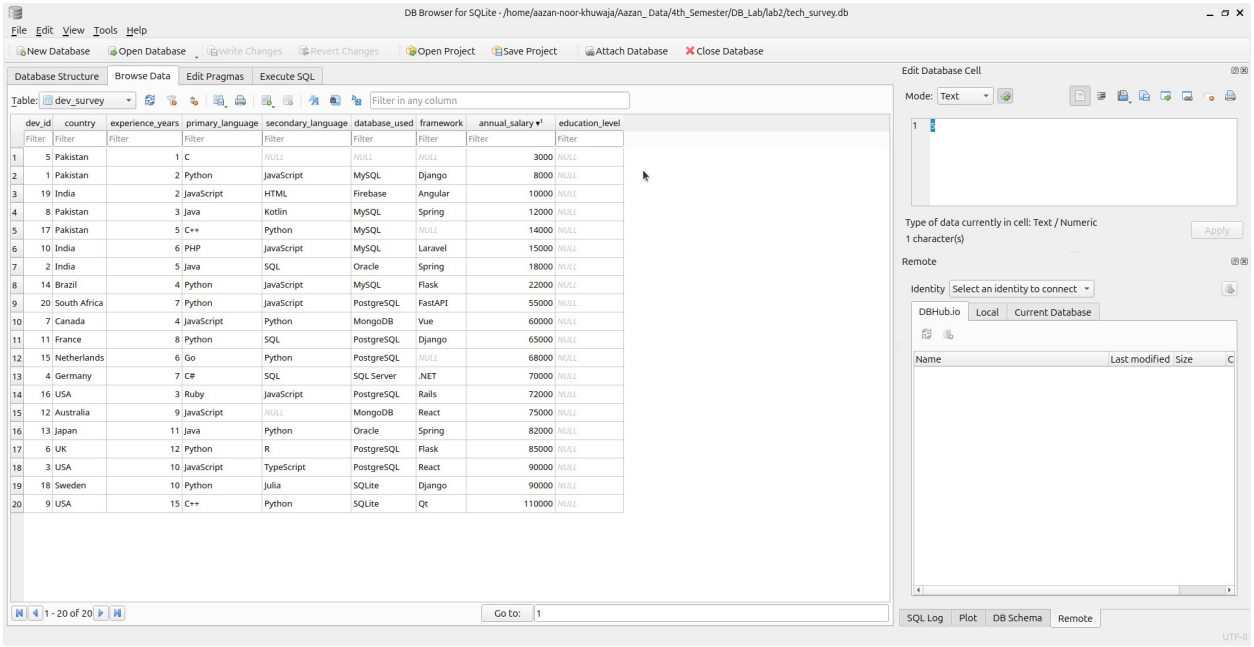
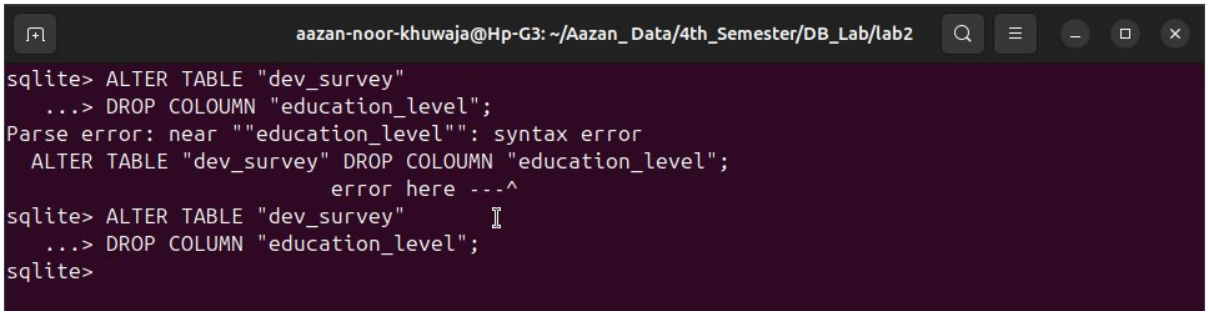


Figure 2 After

4. **Drop column education_level:**

Command Input:

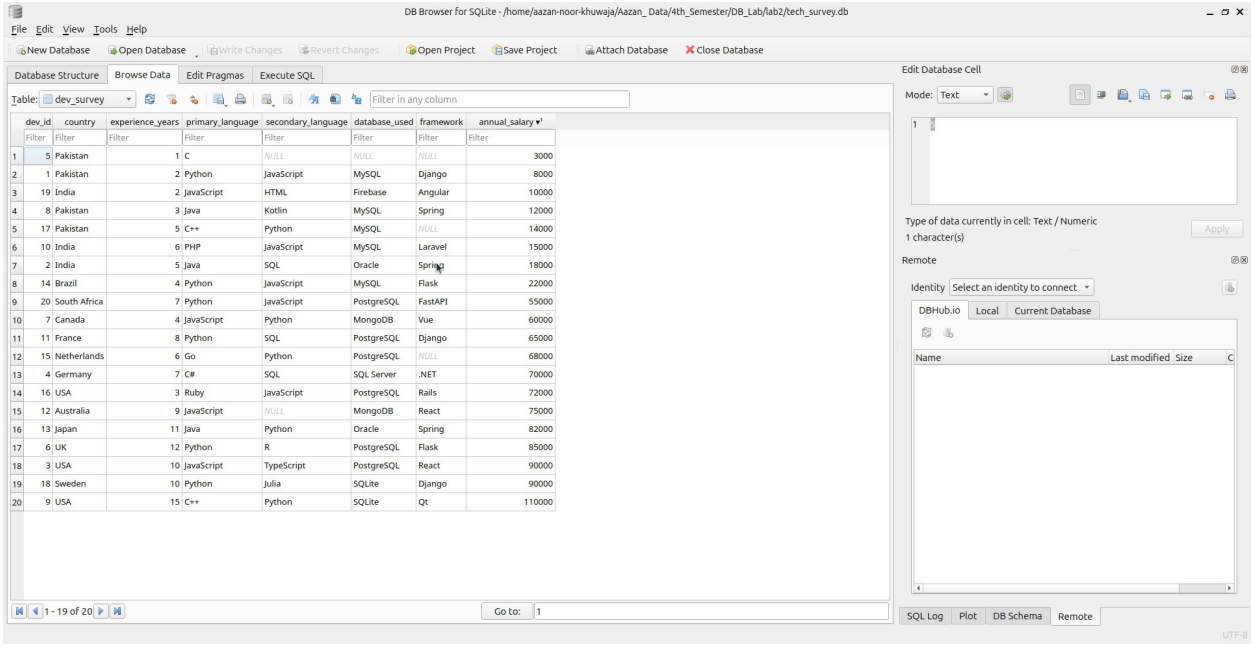


Command:

ALTER TABLE "dev_survey"

DROP COLUMN "education_level";

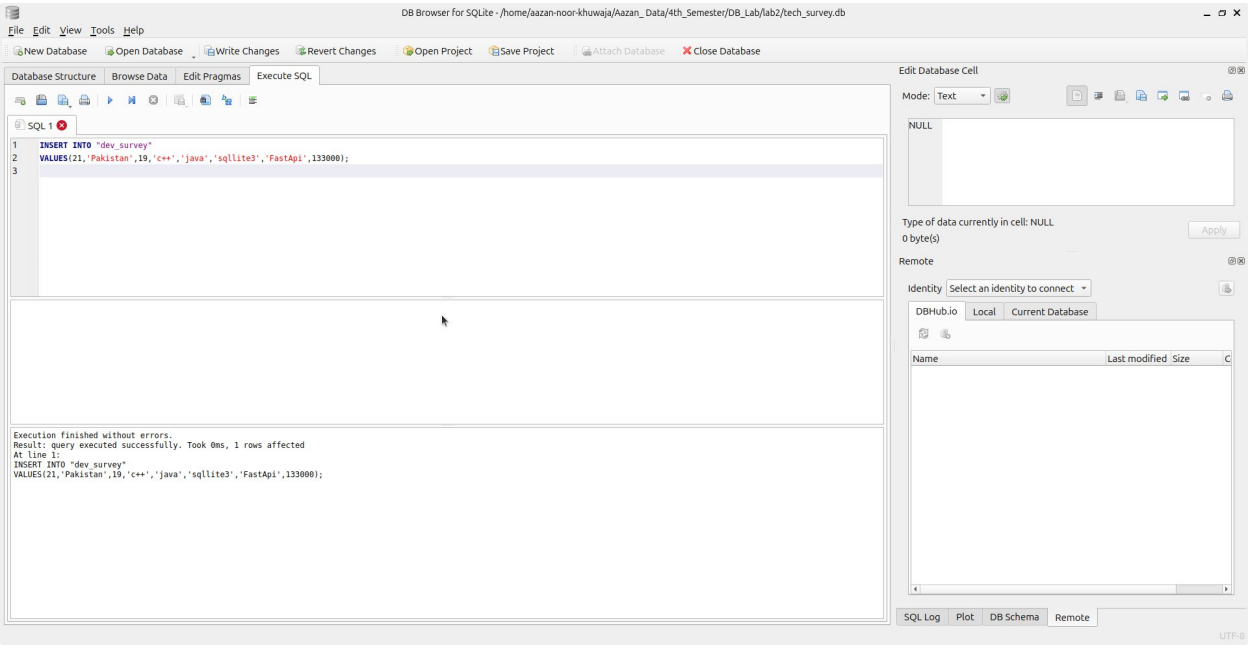
Output:



INSERT PART:

1. **Insert all columns for one record:**

Command Input:

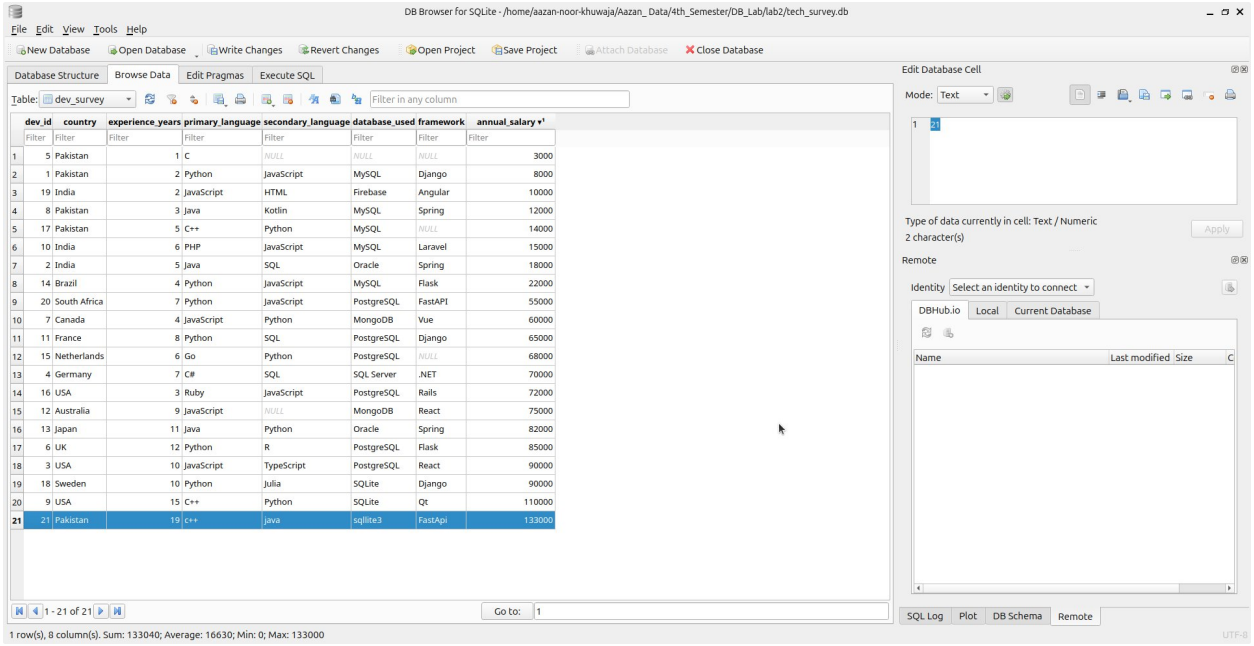


Command:

INSERT INTO "dev_survey"

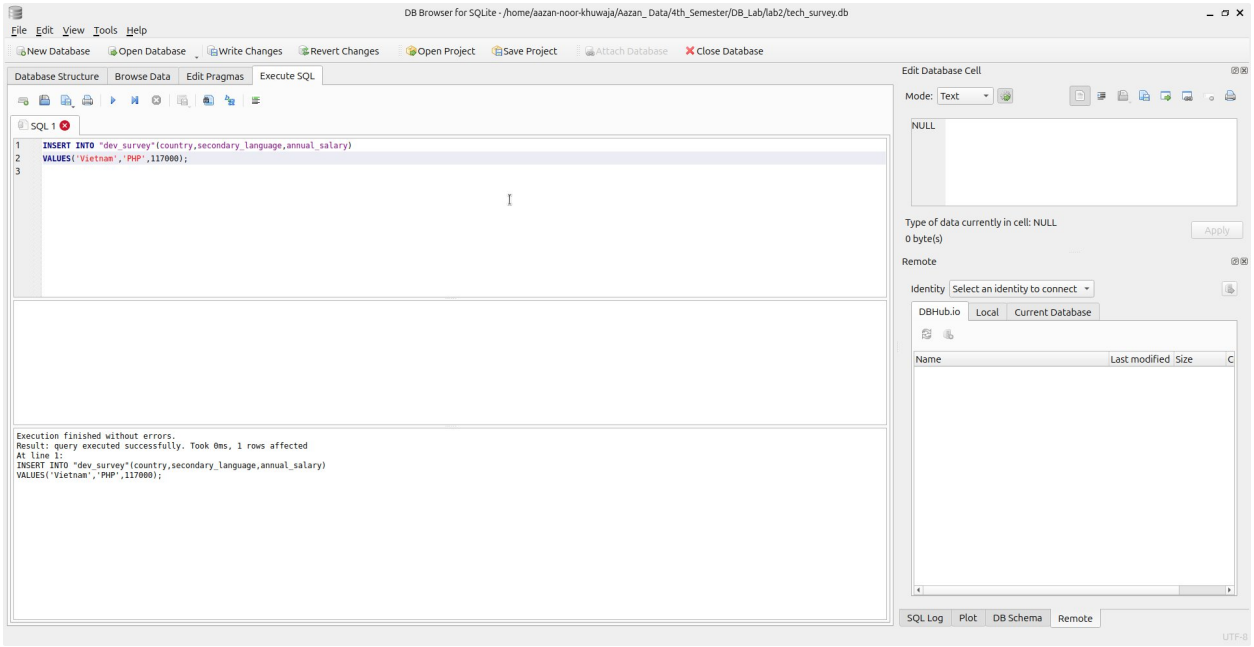
VALUES(21,'Pakistan',19,'c++','java','sqllite3','FastApi',133000);

Output:



2. **Insert specific columns only for one record:**

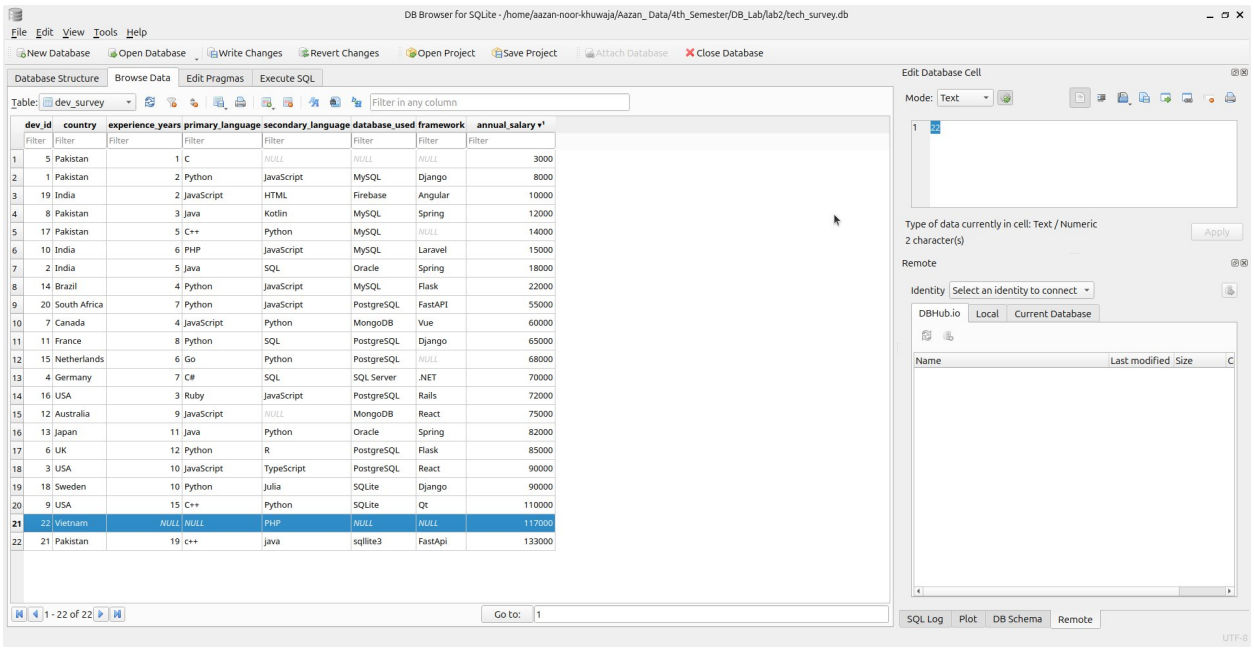
Command Input:



Command:

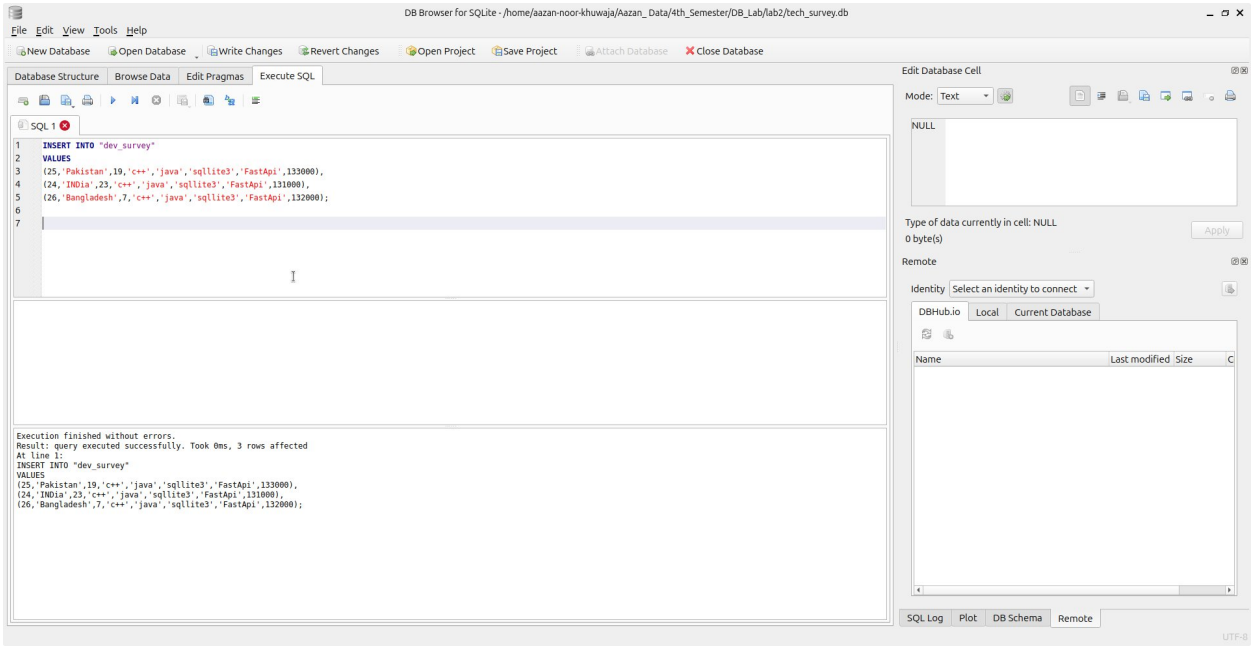
```
INSERT INTO "dev_survey"(country,secondary_language,annual_salary)
VALUES('Vietnam','PHP',117000);
```

Output:



3. **Insert 3 rows in one statement:**

Command Input:



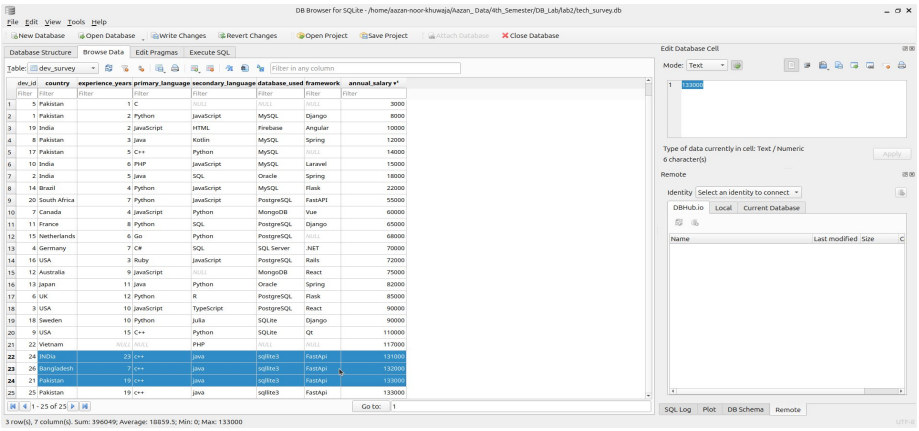
Command:

```
INSERT INTO "dev_survey"

VALUES

(25,'Pakistan',19,'c++','java','sqllite3','FastApi',133000),
```

(24,'INDia',23,'c++','java','sqllite3','FastApi',131000),

(26,'Bangladesh',7,'c++','java','sqllite3','FastApi',132000);

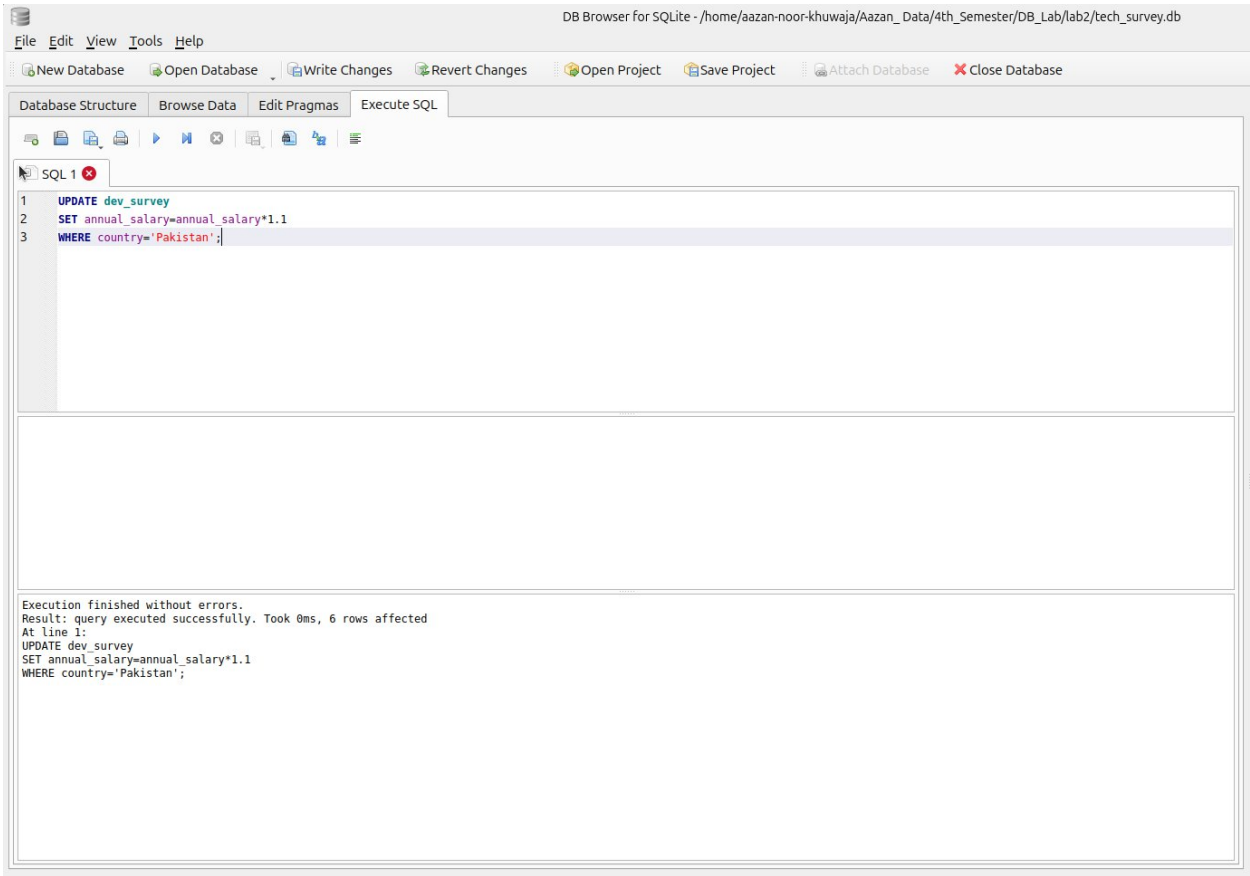
Output:



UPDATE PART:

1. Update salary of developers from Pakistan by +10%:

Command Input:



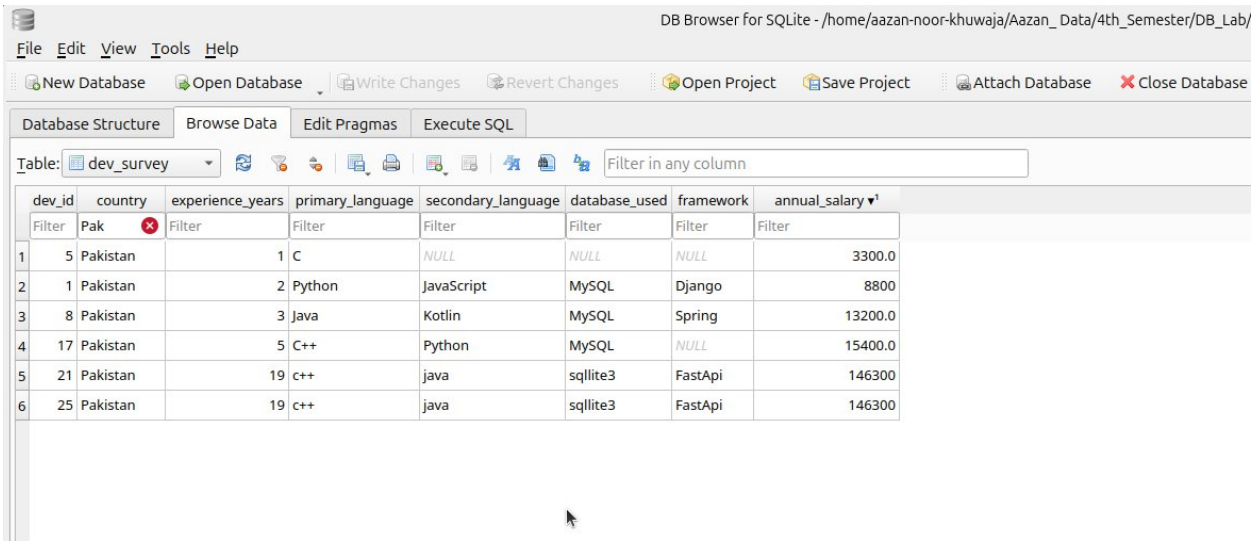
Command:

UPDATE dev_survey

SET annual_salary=annual_salary*1.1

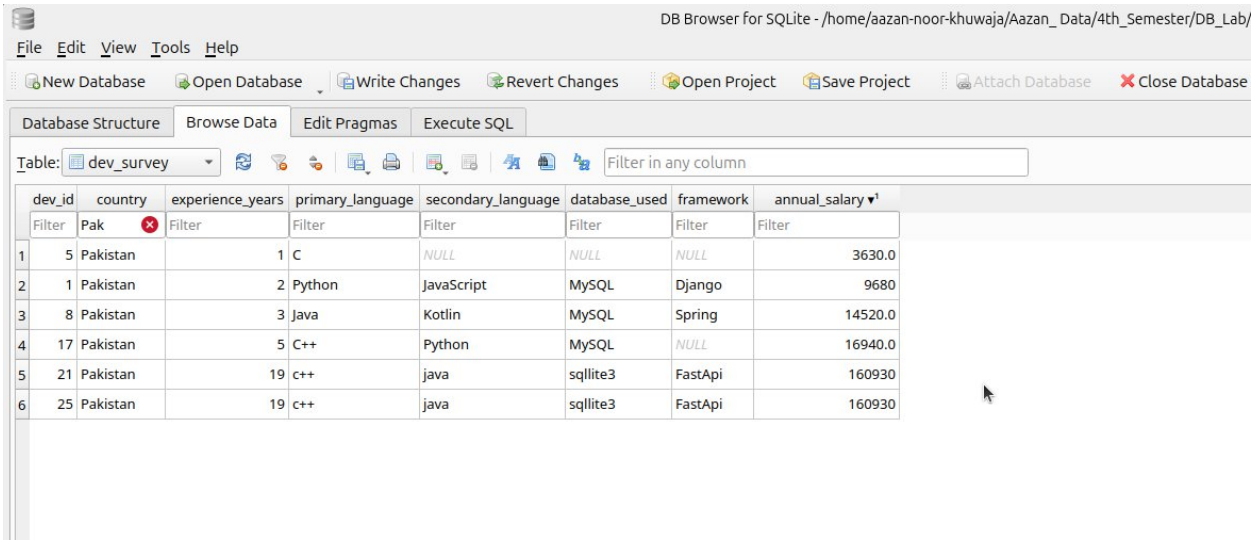
WHERE country='Pakistan';

Output:



	dev_id	country	experience_years	primary_language	secondary_language	database_used	framework	annual_salary
	Filter	Pak	Filter	Filter	Filter	Filter	Filter	Filter
1	5	Pakistan	1	C	NULL	NULL	NULL	3300.0
2	1	Pakistan	2	Python	JavaScript	MySQL	Django	8800
3	8	Pakistan	3	Java	Kotlin	MySQL	Spring	13200.0
4	17	Pakistan	5	C++	Python	MySQL	NULL	15400.0
5	21	Pakistan	19	c++	java	sqllite3	FastApi	146300
6	25	Pakistan	19	c++	java	sqllite3	FastApi	146300

Figure 3 Before

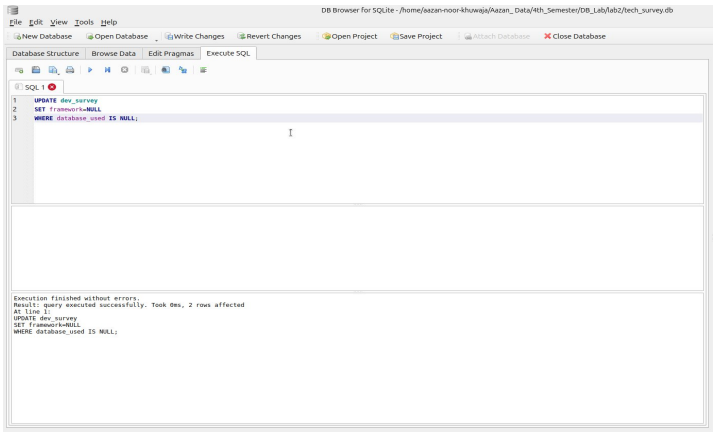


	dev_id	country	experience_years	primary_language	secondary_language	database_used	framework	annual_salary
	Filter	Pak	Filter	Filter	Filter	Filter	Filter	Filter
1	5	Pakistan	1	C	NULL	NULL	NULL	3630.0
2	1	Pakistan	2	Python	JavaScript	MySQL	Django	9680
3	8	Pakistan	3	Java	Kotlin	MySQL	Spring	14520.0
4	17	Pakistan	5	C++	Python	MySQL	NULL	16940.0
5	21	Pakistan	19	c++	java	sqllite3	FastApi	160930
6	25	Pakistan	19	c++	java	sqllite3	FastApi	160930

Figure 4 After

2. Update framework to NULL where database_used is NULL:

Command Input:



Command:

UPDATE dev_survey

SET framework=NULL

WHERE database_used IS NULL;

Output:

DB Browser for SQLite - /home/aazan-noor-khuwaja/Aazan_ Data/4th_Semester/DB_Lab/lab2/tech_survey.db

File Edit View Tools Help

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

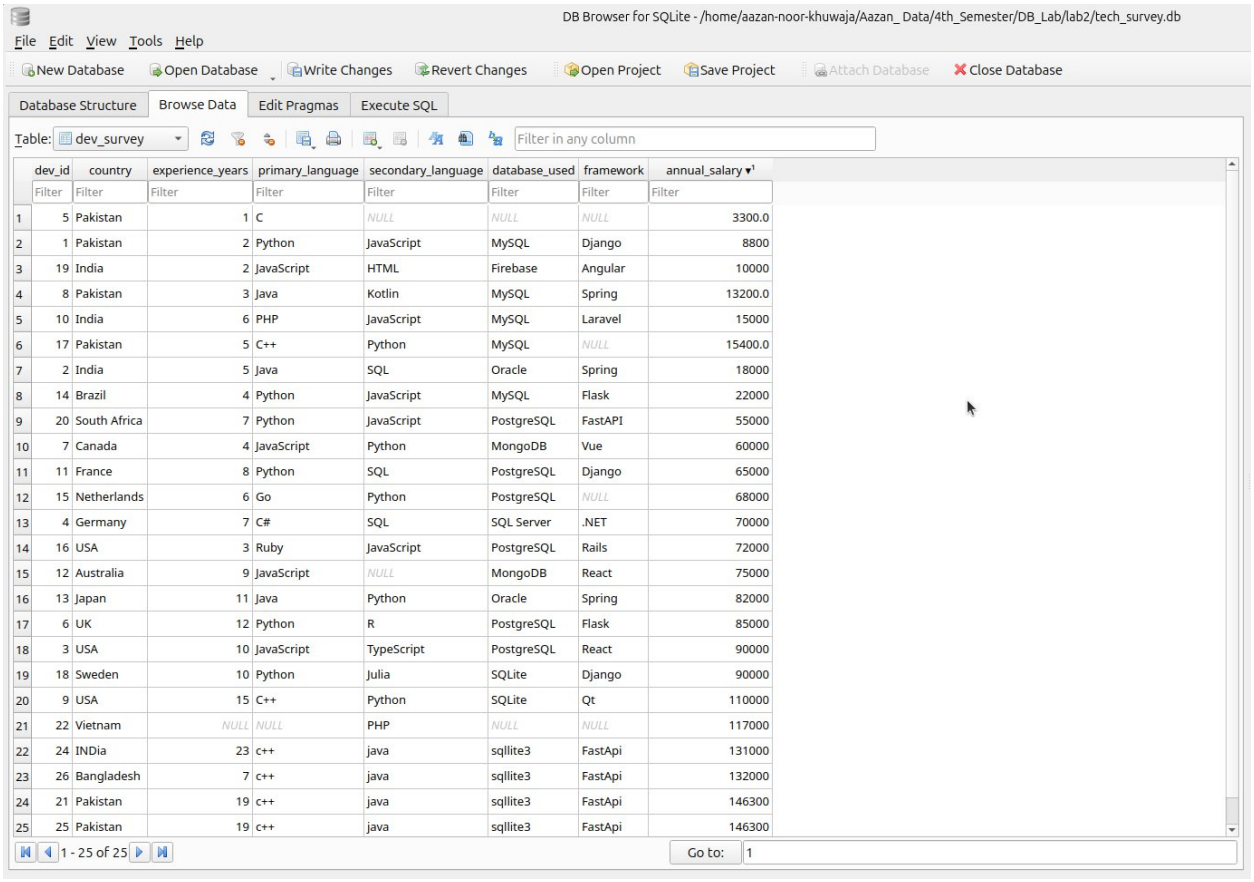
Database Structure | Browse Data | Edit Pragmas | Execute SQL

Table: dev_survey — Filter in any column

	dev_id	country	experience_years	primary_language	secondary_language	database_used	framework	annual_salary
1	5	Pakistan	1	C	NULL	NULL	FLASK	3300.0
2	1	Pakistan	2	Python	JavaScript	MySQL	Django	8800
3	19	India	2	JavaScript	HTML	Firebase	Angular	10000
4	8	Pakistan	3	Java	Kotlin	MySQL	Spring	13200.0
5	10	India	6	PHP	JavaScript	MySQL	Laravel	15000
6	17	Pakistan	5	C++	Python	MySQL	NULL	15400.0
7	2	India	5	Java	SQL	Oracle	Spring	18000
8	14	Brazil	4	Python	JavaScript	MySQL	Flask	22000
9	20	South Africa	7	Python	JavaScript	PostgreSQL	FastAPI	55000
10	7	Canada	4	JavaScript	Python	MongoDB	Vue	60000
11	11	France	8	Python	SQL	PostgreSQL	Django	65000
12	15	Netherlands	6	Go	Python	PostgreSQL	NULL	68000
13	4	Germany	7	C#	SQL	SQL Server	.NET	70000
14	16	USA	3	Ruby	JavaScript	PostgreSQL	Rails	72000
15	12	Australia	9	JavaScript	NULL	MongoDB	React	75000
16	13	Japan	11	Java	Python	Oracle	Spring	82000
17	6	UK	12	Python	R	PostgreSQL	Flask	85000
18	3	USA	10	JavaScript	TypeScript	PostgreSQL	React	90000
19	18	Sweden	10	Python	Julia	SQLite	Django	90000
20	9	USA	15	C++	Python	SQLite	Qt	110000
21	22	Vietnam	NULL	NULL	PHP	NULL	JANGO	117000
22	24	INDia	23	c++	java	sqllite3	FastApi	131000
23	26	Bangladesh	7	c++	java	sqllite3	FastApi	132000
24	21	Pakistan	19	c++	java	sqllite3	FastApi	146300
25	25	Pakistan	19	c++	java	sqllite3	FastApi	146300

1 - 25 of 25 — Go to: 1

Figure 5 Before

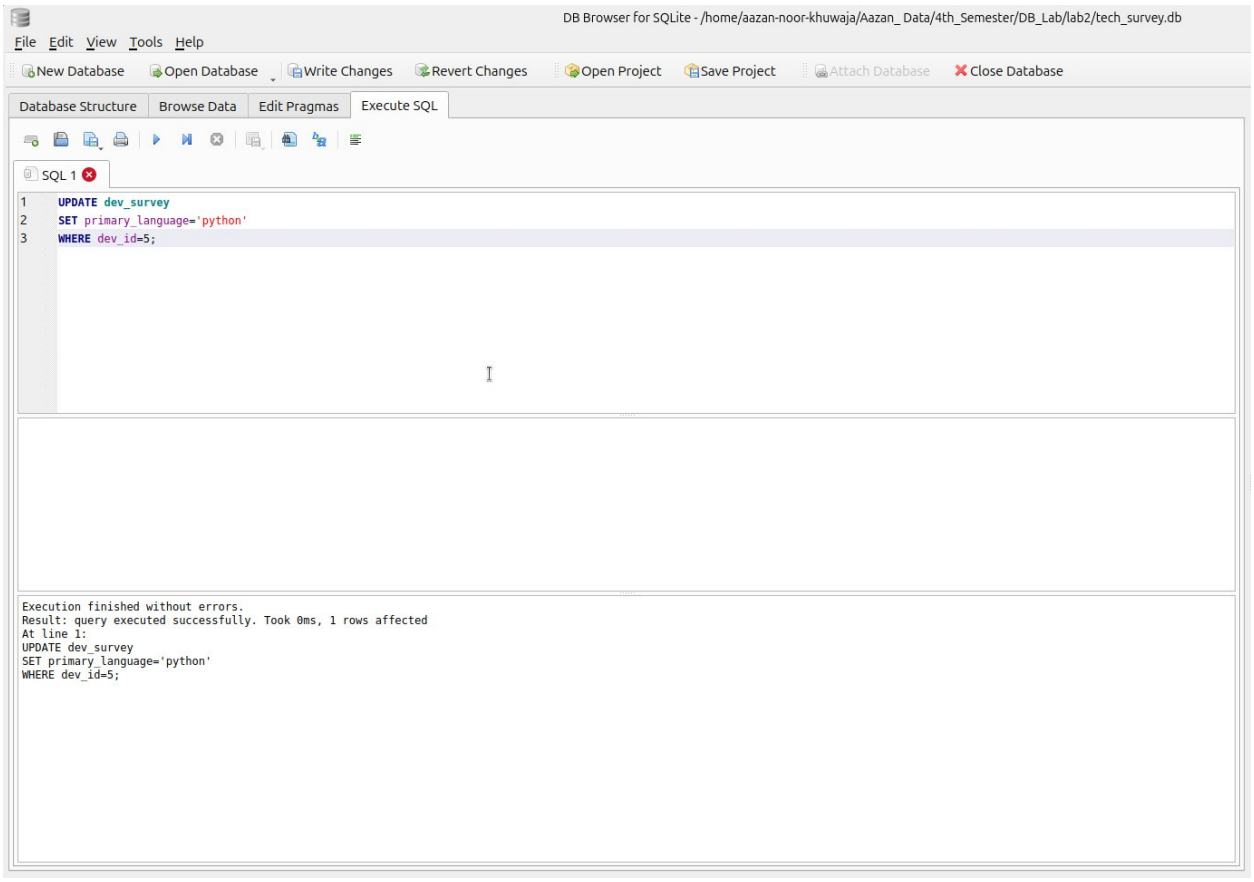


	dev_id	country	experience_years	primary_language	secondary_language	database_used	framework	annual_salary
1	5	Pakistan	1	C	NULL	NULL	NULL	3300.0
2	1	Pakistan	2	Python	JavaScript	MySQL	Django	8800
3	19	India	2	JavaScript	HTML	Firebase	Angular	10000
4	8	Pakistan	3	Java	Kotlin	MySQL	Spring	13200.0
5	10	India	6	PHP	JavaScript	MySQL	Laravel	15000
6	17	Pakistan	5	C++	Python	MySQL	NULL	15400.0
7	2	India	5	Java	SQL	Oracle	Spring	18000
8	14	Brazil	4	Python	JavaScript	MySQL	Flask	22000
9	20	South Africa	7	Python	JavaScript	PostgreSQL	FastAPI	55000
10	7	Canada	4	JavaScript	Python	MongoDB	Vue	60000
11	11	France	8	Python	SQL	PostgreSQL	Django	65000
12	15	Netherlands	6	Go	Python	PostgreSQL	NULL	68000
13	4	Germany	7	C#	SQL	SQL Server	.NET	70000
14	16	USA	3	Ruby	JavaScript	PostgreSQL	Rails	72000
15	12	Australia	9	JavaScript	NULL	MongoDB	React	75000
16	13	Japan	11	Java	Python	Oracle	Spring	82000
17	6	UK	12	Python	R	PostgreSQL	Flask	85000
18	3	USA	10	JavaScript	TypeScript	PostgreSQL	React	90000
19	18	Sweden	10	Python	Julia	SQLite	Django	90000
20	9	USA	15	C++	Python	SQLite	Qt	110000
21	22	Vietnam	NULL	NULL	PHP	NULL	NULL	117000
22	24	INDia	23	c++	java	sqllite3	FastApi	131000
23	26	Bangladesh	7	c++	java	sqllite3	FastApi	132000
24	21	Pakistan	19	c++	java	sqllite3	FastApi	146300
25	25	Pakistan	19	c++	java	sqllite3	FastApi	146300

Figure 6 After

3. Change the primary language of dev_id = 5 to Python:

Command Input:



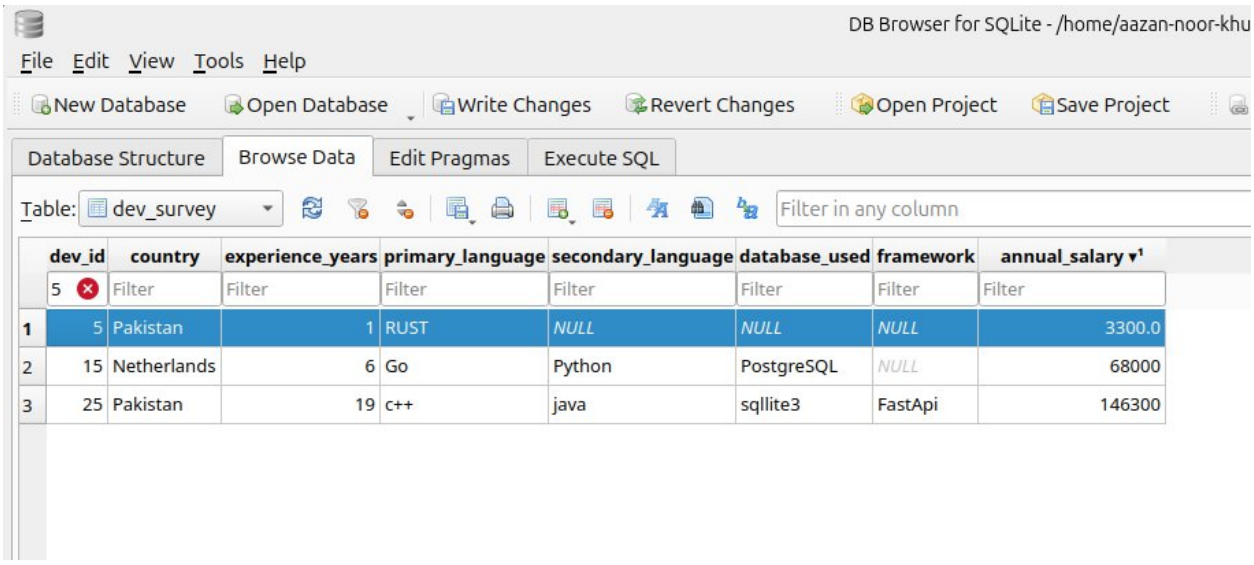
Command:

UPDATE dev_survey

SET primary_language='python'

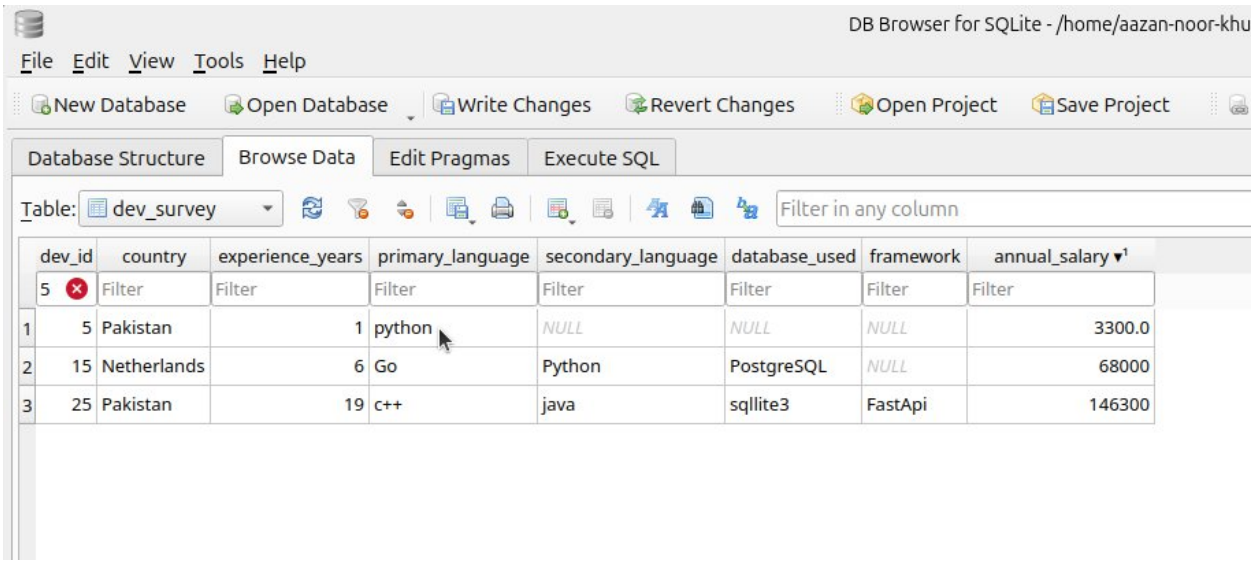
WHERE dev_id=5;

Output:



	dev_id	country	experience_years	primary_language	secondary_language	database_used	framework	annual_salary
	5	Filter	Filter	Filter	Filter	Filter	Filter	Filter
1	5	Pakistan	1	RUST	*NULL*	*NULL*	*NULL*	3300.0
2	15	Netherlands	6	Go	Python	PostgreSQL	*NULL*	68000
3	25	Pakistan	19	c++	java	sqllite3	FastApi	146300

Figure 7 Before



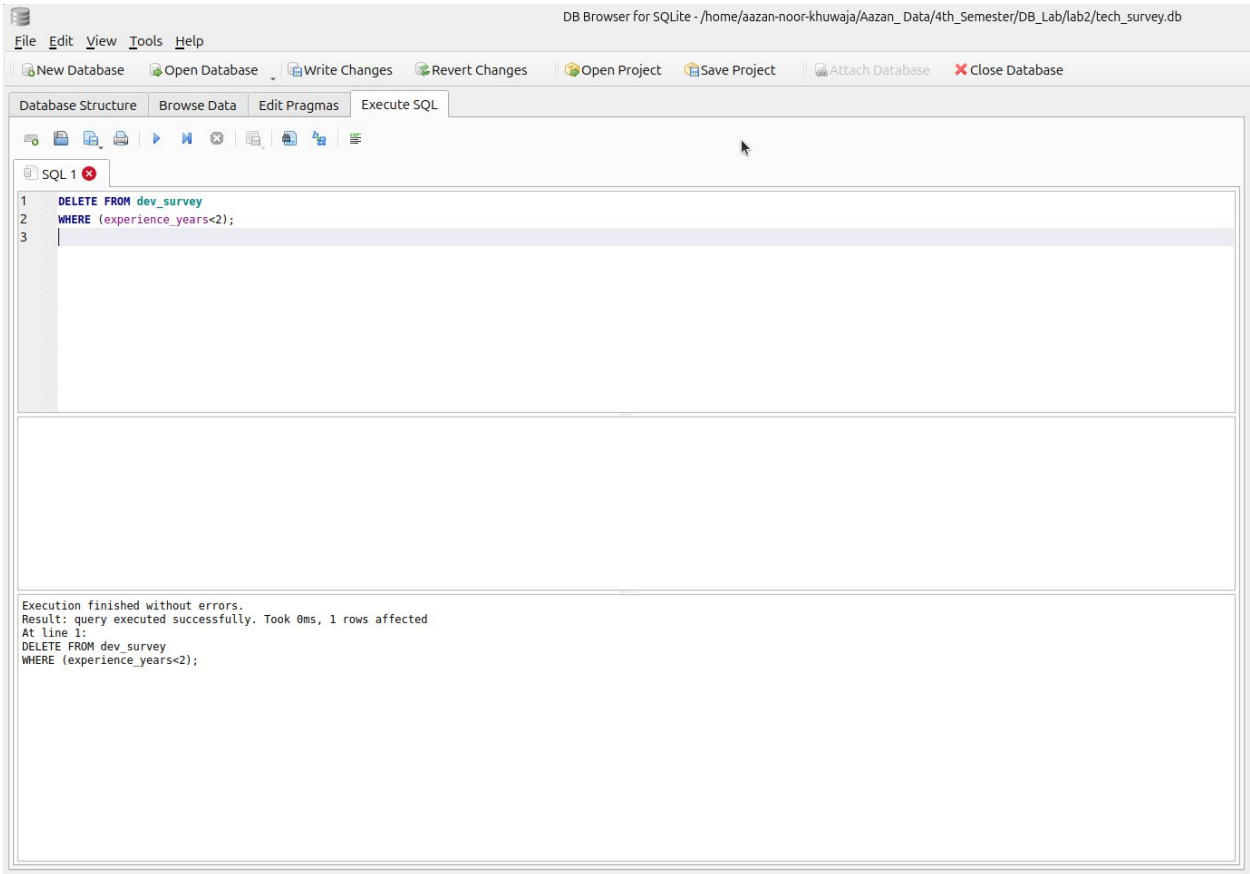
	dev_id	country	experience_years	primary_language	secondary_language	database_used	framework	annual_salary
	5	Filter	Filter	Filter	Filter	Filter	Filter	Filter
1	5	Pakistan	1	python	*NULL*	*NULL*	*NULL*	3300.0
2	15	Netherlands	6	Go	Python	PostgreSQL	*NULL*	68000
3	25	Pakistan	19	c++	java	sqllite3	FastApi	146300

Figure 8 After

DELETE PART:

1. Delete developers with experience < 2 years:

Command Input:

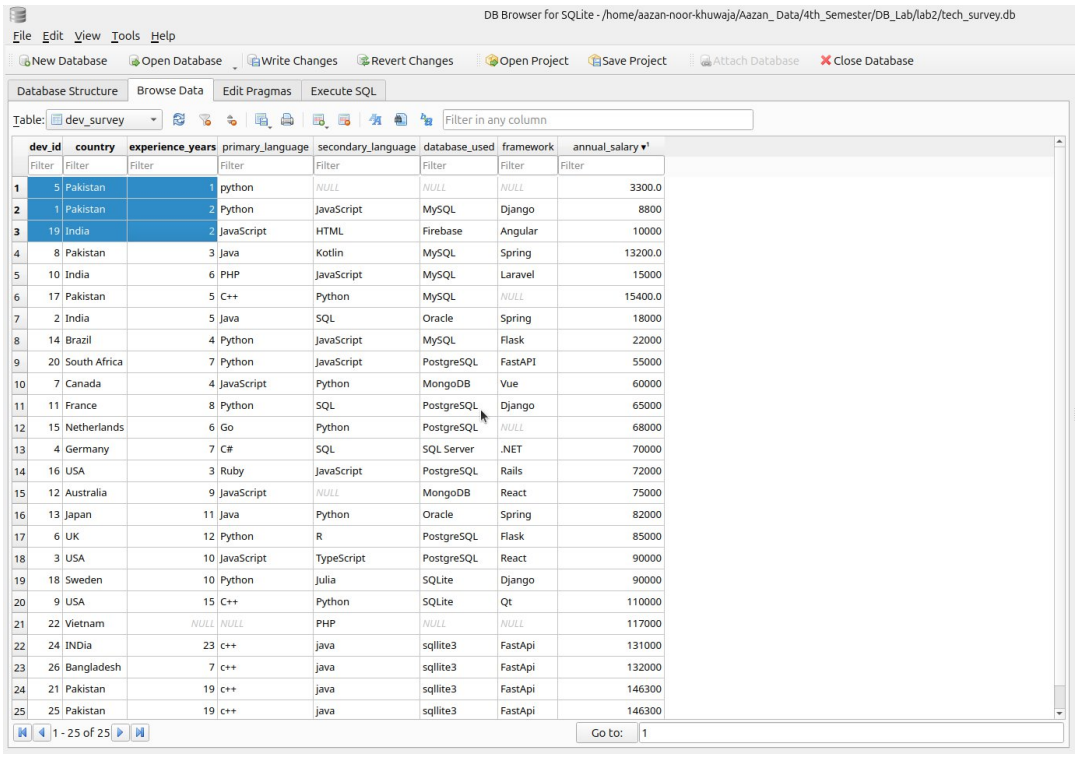


Command:

DELETE FROM dev_survey

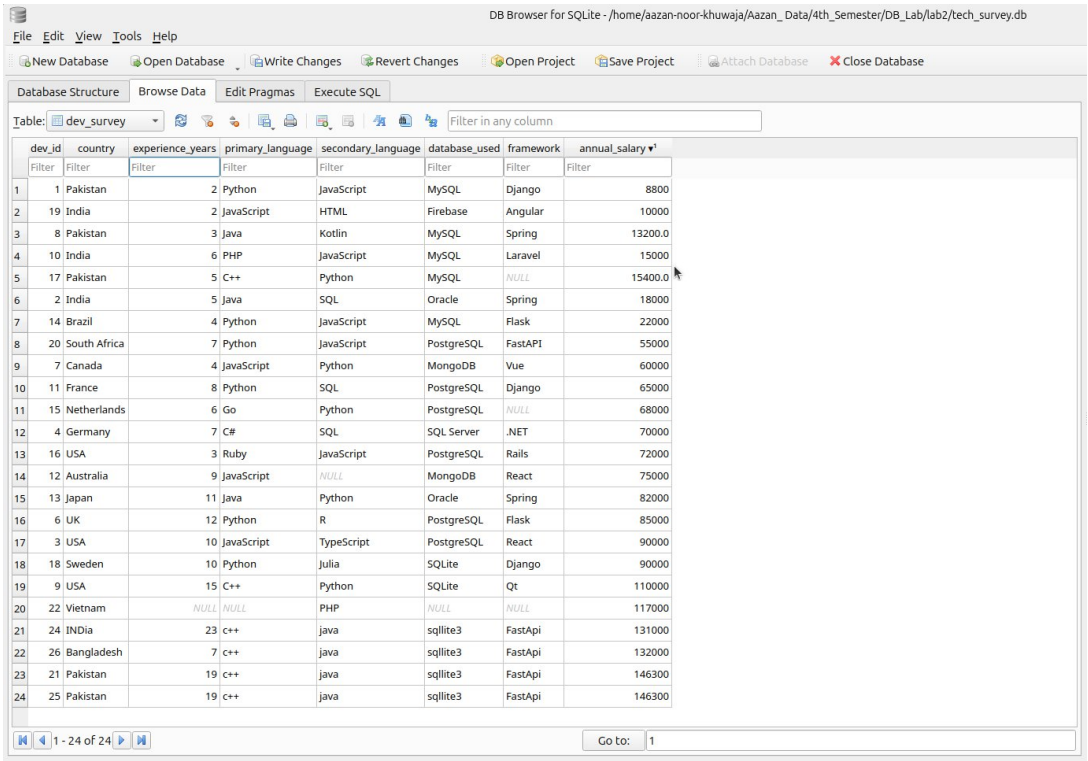
WHERE (experience_years<2);

Output:



	dev_id	country	experience_years	primary_language	secondary_language	database_used	framework	annual_salary
1	5	Pakistan	1	python	NULL	NULL	NULL	3300.0
2	1	Pakistan	2	Python	JavaScript	MySQL	Django	8800
3	19	India	2	JavaScript	HTML	Firebase	Angular	10000
4	8	Pakistan	3	Java	Kotlin	MySQL	Spring	13200.0
5	10	India	6	PHP	JavaScript	MySQL	Laravel	15000
6	17	Pakistan	5	C++	Python	MySQL	NULL	15400.0
7	2	India	5	Java	SQL	Oracle	Spring	18000
8	14	Brazil	4	Python	JavaScript	MySQL	Flask	22000
9	20	South Africa	7	Python	JavaScript	PostgreSQL	FastAPI	55000
10	7	Canada	4	JavaScript	Python	MongoDB	Vue	60000
11	11	France	8	Python	SQL	PostgreSQL	Django	65000
12	15	Netherlands	6	Go	Python	PostgreSQL	NULL	68000
13	4	Germany	7	C#	SQL	SQL Server	.NET	70000
14	16	USA	3	Ruby	JavaScript	PostgreSQL	Rails	72000
15	12	Australia	9	JavaScript	NULL	MongoDB	React	75000
16	13	Japan	11	Java	Python	Oracle	Spring	82000
17	6	UK	12	Python	R	PostgreSQL	Flask	85000
18	3	USA	10	JavaScript	TypeScript	PostgreSQL	React	90000
19	18	Sweden	10	Python	Julia	SQLite	Django	90000
20	9	USA	15	C++	Python	SQLite	Qt	110000
21	22	Vietnam	NULL	NULL	PHP	NULL	NULL	117000
22	24	INDia	23	c++	java	sqllite3	FastApi	131000
23	26	Bangladesh	7	c++	java	sqllite3	FastApi	132000
24	21	Pakistan	19	c++	java	sqllite3	FastApi	146300
25	25	Pakistan	19	c++	java	sqllite3	FastApi	146300

Figure 9 Before

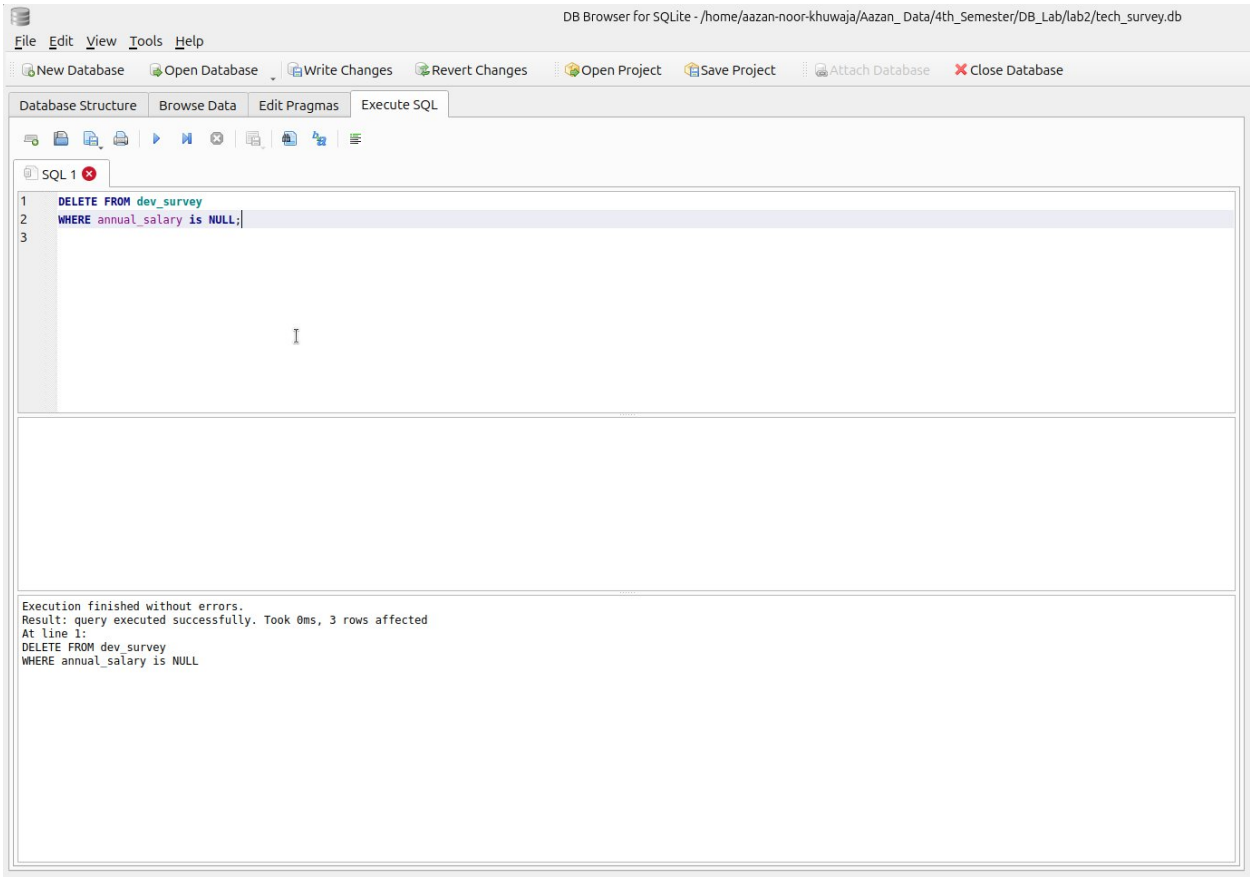


	dev_id	country	experience_years	primary_language	secondary_language	database_used	framework	annual_salary
1	1	Pakistan	2	Python	JavaScript	MySQL	Django	8800
2	19	India	2	JavaScript	HTML	Firebase	Angular	10000
3	8	Pakistan	3	Java	Kotlin	MySQL	Spring	13200.0
4	10	India	6	PHP	JavaScript	MySQL	Laravel	15000
5	17	Pakistan	5	C++	Python	MySQL	NULL	15400.0
6	2	India	5	Java	SQL	Oracle	Spring	18000
7	14	Brazil	4	Python	JavaScript	MySQL	Flask	22000
8	20	South Africa	7	Python	JavaScript	PostgreSQL	FastAPI	55000
9	7	Canada	4	JavaScript	Python	MongoDB	Vue	60000
10	11	France	8	Python	SQL	PostgreSQL	Django	65000
11	15	Netherlands	6	Go	Python	PostgreSQL	NULL	68000
12	4	Germany	7	C#	SQL	SQL Server	.NET	70000
13	16	USA	3	Ruby	JavaScript	PostgreSQL	Rails	72000
14	12	Australia	9	JavaScript	NULL	MongoDB	React	75000
15	13	Japan	11	Java	Python	Oracle	Spring	82000
16	6	UK	12	Python	R	PostgreSQL	Flask	85000
17	3	USA	10	JavaScript	TypeScript	PostgreSQL	React	90000
18	18	Sweden	10	Python	Julia	SQLite	Django	90000
19	9	USA	15	C++	Python	SQLite	Qt	110000
20	22	Vietnam	NULL	NULL	PHP	NULL	NULL	117000
21	24	INDia	23	c++	java	sqllite3	FastApi	131000
22	26	Bangladesh	7	c++	java	sqllite3	FastApi	132000
23	21	Pakistan	19	c++	java	sqllite3	FastApi	146300
24	25	Pakistan	19	c++	java	sqllite3	FastApi	146300

Figure 10 After

2. Delete developers whose salary is NULL:

Command Input:

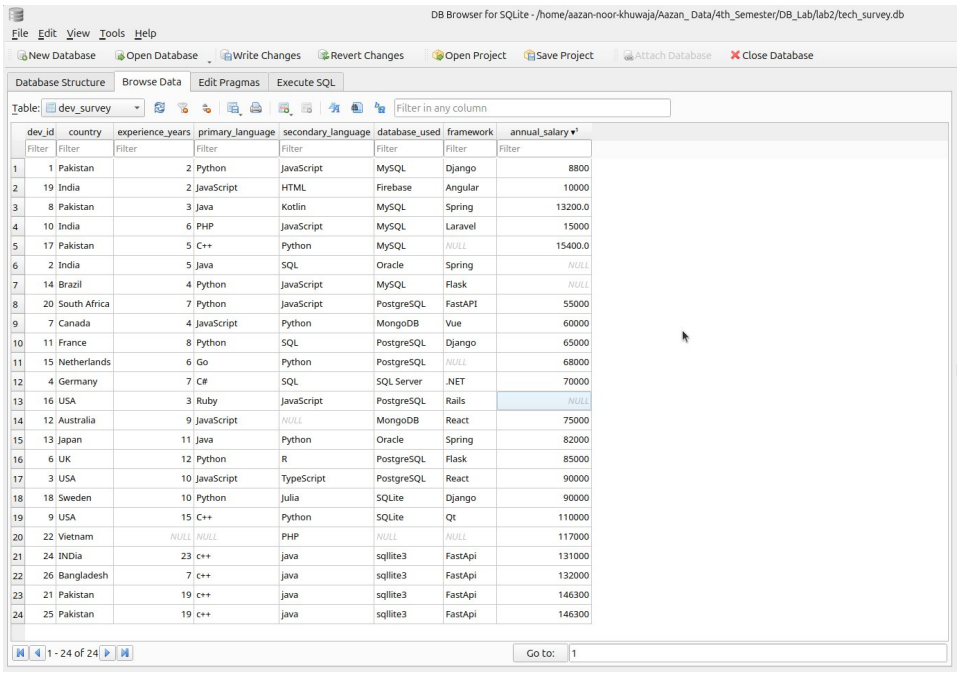


Command:

DELETE FROM dev_survey

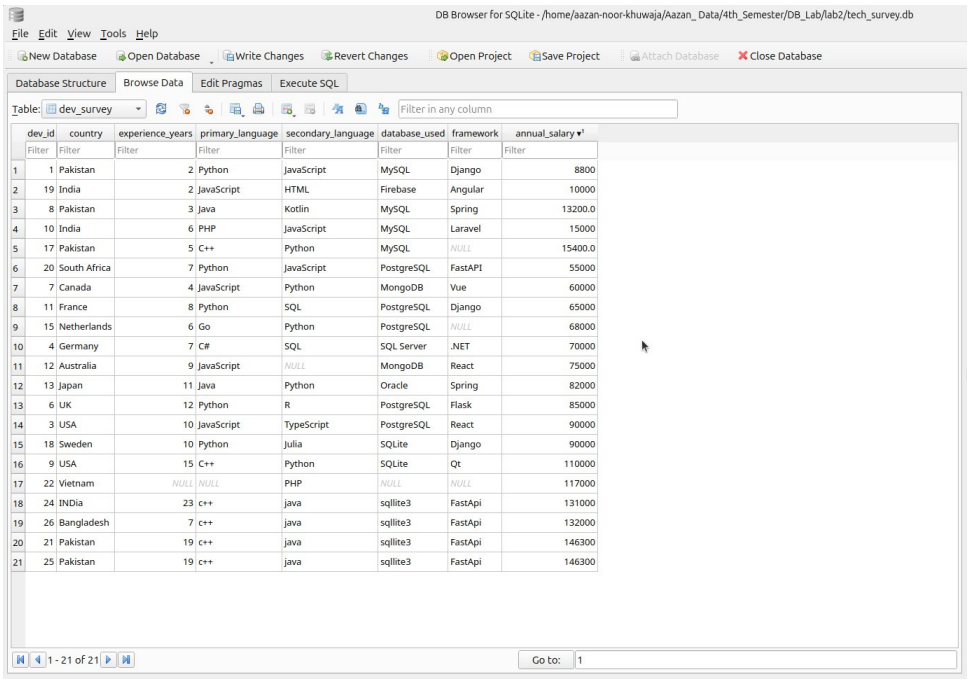
WHERE annual_salary is NULL;

Output:



	dev_id	country	experience_years	primary_language	secondary_language	database_used	framework	annual_salary
1	1	Pakistan	2	Python	JavaScript	MySQL	Django	8800
2	19	India	2	JavaScript	HTML	Firebase	Angular	10000
3	8	Pakistan	3	Java	Kotlin	MySQL	Spring	13200.0
4	10	India	6	PHP	JavaScript	MySQL	Laravel	15000
5	17	Pakistan	5	C++	Python	MySQL	NULL	15400.0
6	2	India	5	Java	SQL	Oracle	Spring	NULL
7	14	Brazil	4	Python	JavaScript	MySQL	Flask	NULL
8	20	South Africa	7	Python	JavaScript	PostgreSQL	FastAPI	55000
9	7	Canada	4	JavaScript	Python	MongoDB	Vue	60000
10	11	France	8	Python	SQL	PostgreSQL	Django	65000
11	15	Netherlands	6	Go	Python	PostgreSQL	NULL	68000
12	4	Germany	7	C#	SQL	SQL Server	.NET	70000
13	16	USA	3	Ruby	JavaScript	PostgreSQL	Rails	NULL
14	12	Australia	9	JavaScript	NULL	MongoDB	React	75000
15	13	Japan	11	Java	Python	Oracle	Spring	82000
16	6	UK	12	Python	R	PostgreSQL	Flask	85000
17	3	USA	10	JavaScript	TypeScript	PostgreSQL	React	90000
18	18	Sweden	10	Python	Julia	SQLite	Django	90000
19	9	USA	15	C++	Python	SQLite	Qt	110000
20	22	Vietnam	NULL	NULL	PHP	NULL	NULL	117000
21	24	INDia	23	c++	java	sqllite3	FastApi	131000
22	26	Bangladesh	7	c++	java	sqllite3	FastApi	132000
23	21	Pakistan	19	c++	java	sqllite3	FastApi	146300
24	25	Pakistan	19	c++	java	sqllite3	FastApi	146300

Figure 11 Before



	dev_id	country	experience_years	primary_language	secondary_language	database_used	framework	annual_salary
1	1	Pakistan	2	Python	JavaScript	MySQL	Django	8800
2	19	India	2	JavaScript	HTML	Firebase	Angular	10000
3	8	Pakistan	3	Java	Kotlin	MySQL	Spring	13200.0
4	10	India	6	PHP	JavaScript	MySQL	Laravel	15000
5	17	Pakistan	5	C++	Python	MySQL	NULL	15400.0
6	20	South Africa	7	Python	JavaScript	PostgreSQL	FastAPI	55000
7	7	Canada	4	JavaScript	Python	MongoDB	Vue	60000
8	11	France	8	Python	SQL	PostgreSQL	Django	65000
9	15	Netherlands	6	Go	Python	PostgreSQL	NULL	68000
10	4	Germany	7	C#	SQL	SQL Server	.NET	70000
11	12	Australia	9	JavaScript	NULL	MongoDB	React	75000
12	13	Japan	11	Java	Python	Oracle	Spring	82000
13	6	UK	12	Python	R	PostgreSQL	Flask	85000
14	3	USA	10	JavaScript	TypeScript	PostgreSQL	React	90000
15	18	Sweden	10	Python	Julia	SQLite	Django	90000
16	9	USA	15	C++	Python	SQLite	Qt	110000
17	22	Vietnam	NULL	NULL	PHP	NULL	NULL	117000
18	24	INDia	23	c++	java	sqllite3	FastApi	131000
19	26	Bangladesh	7	c++	java	sqllite3	FastApi	132000
20	21	Pakistan	19	c++	java	sqllite3	FastApi	146300
21	25	Pakistan	19	c++	java	sqllite3	FastApi	146300

Figure 12 After

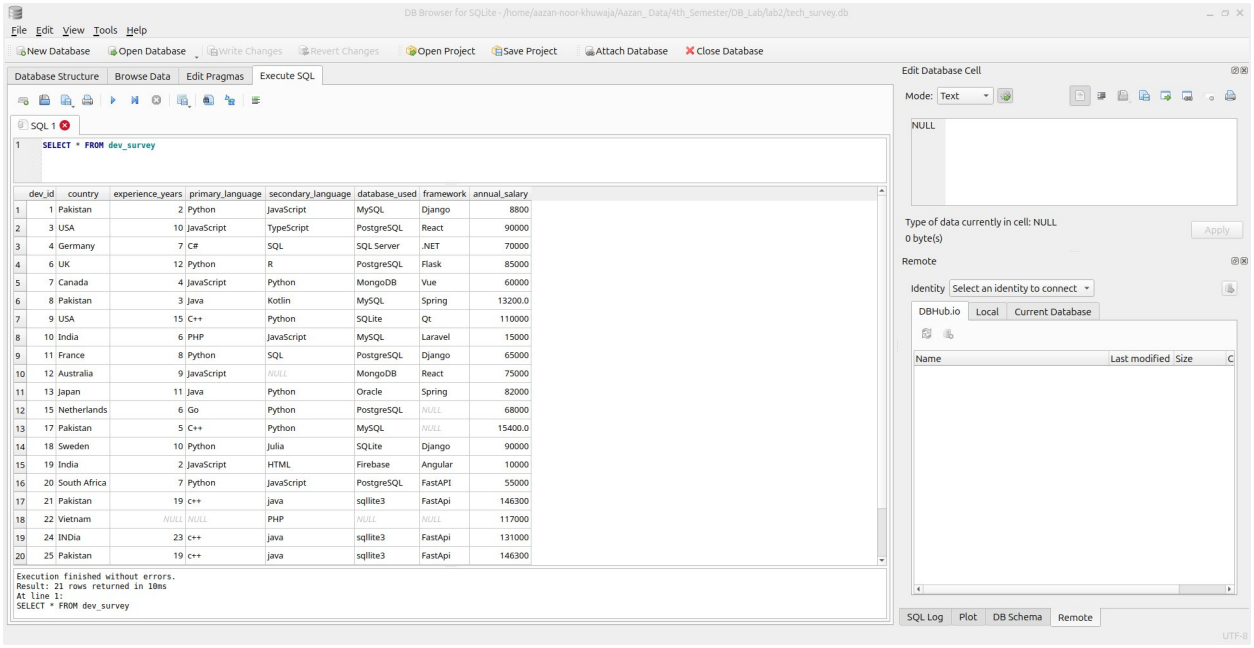
SELECT PART:

1. Display all developer records:

Command:

SELECT * FROM dev_survey

Output:



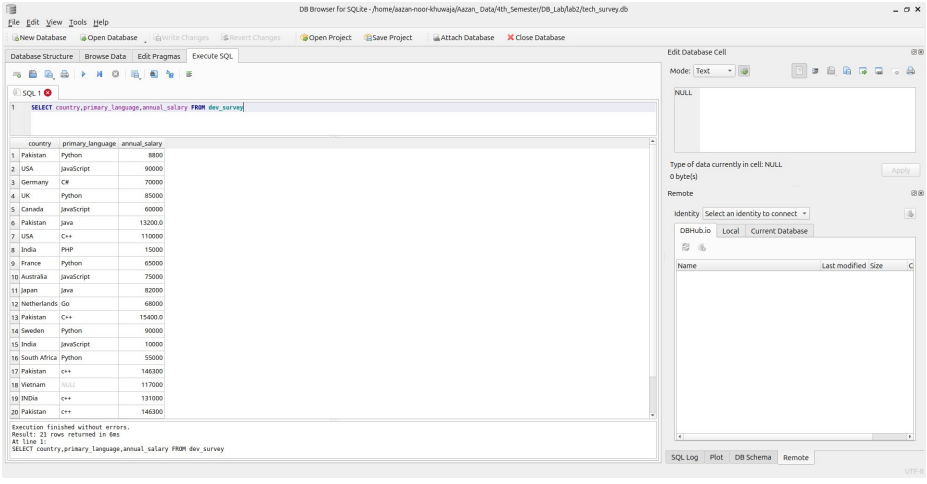
dev_id	country	experience_years	primary_language	secondary_language	database_used	framework	annual_salary
1	Pakistan	2	Python	JavaScript	MySQL	Django	8800
3	USA	10	JavaScript	TypeScript	PostgreSQL	React	90000
4	Germany	7	C#	SQL	SQL Server	.NET	70000
6	UK	12	Python	R	PostgreSQL	Flask	85000
7	Canada	4	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:



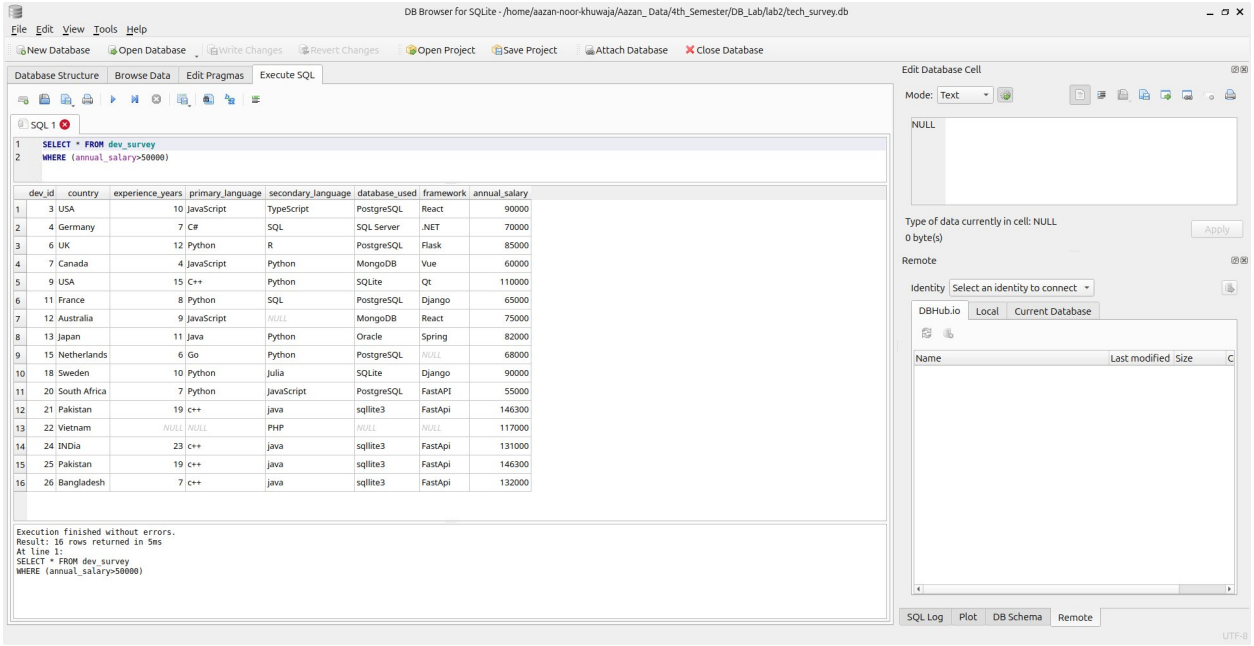
country	primary_language	annual_salary
Pakistan	Python	8800
USA	JavaScript	90000
Germany	C#	70000
UK	Python	85000
Canada	JavaScript	60000
Pakistan	Java	13200.0
USA	C++	110000
India	PHP	15000
France	Python	65000
Australia	JavaScript	75000
Japan	Java	82000
Netherlands	Go	68000
Pakistan	C++	15400.0
Sweden	Python	90000
India	JavaScript	10000
South Africa	Python	55000
Pakistan	c++	146300
Vietnam	NULL	117000
INDia	c++	131000
Pakistan	c++	146300

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

Command:

```
SELECT * FROM dev_survey

WHERE (annual_salary>50000);
```

Output:

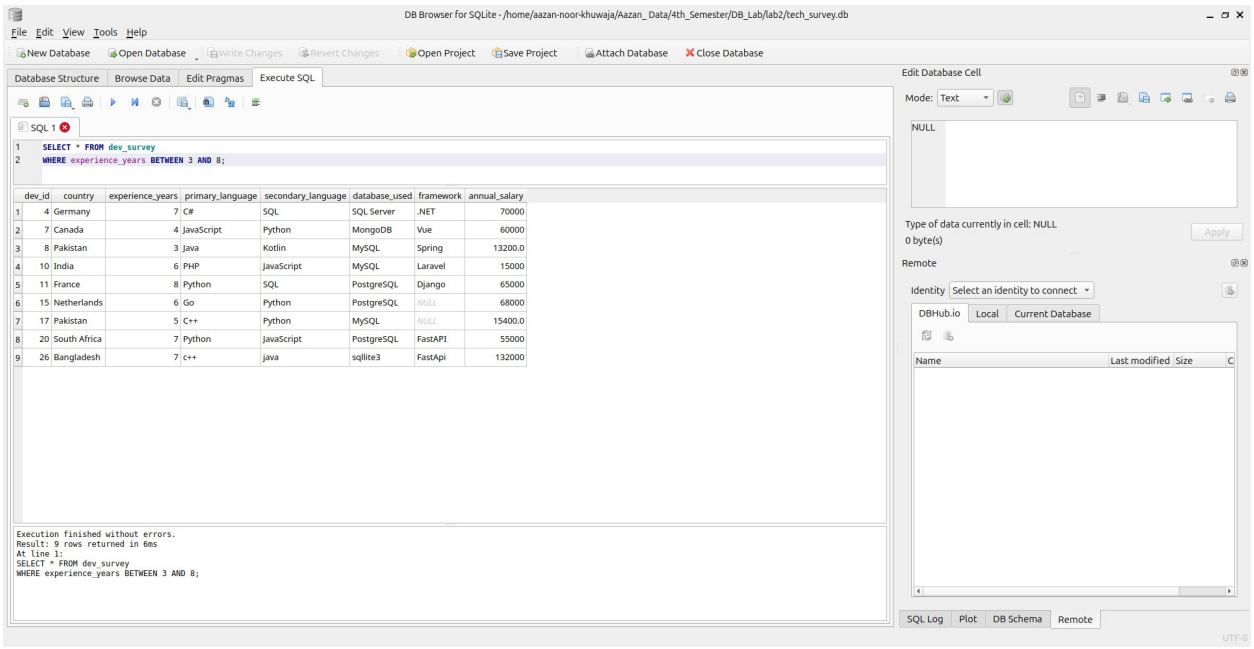


4. List developers with experience between 3 and 8 years:

Command:

```
SELECT * FROM dev_survey

WHERE experience_years BETWEEN 3 AND 8;
```

Output:

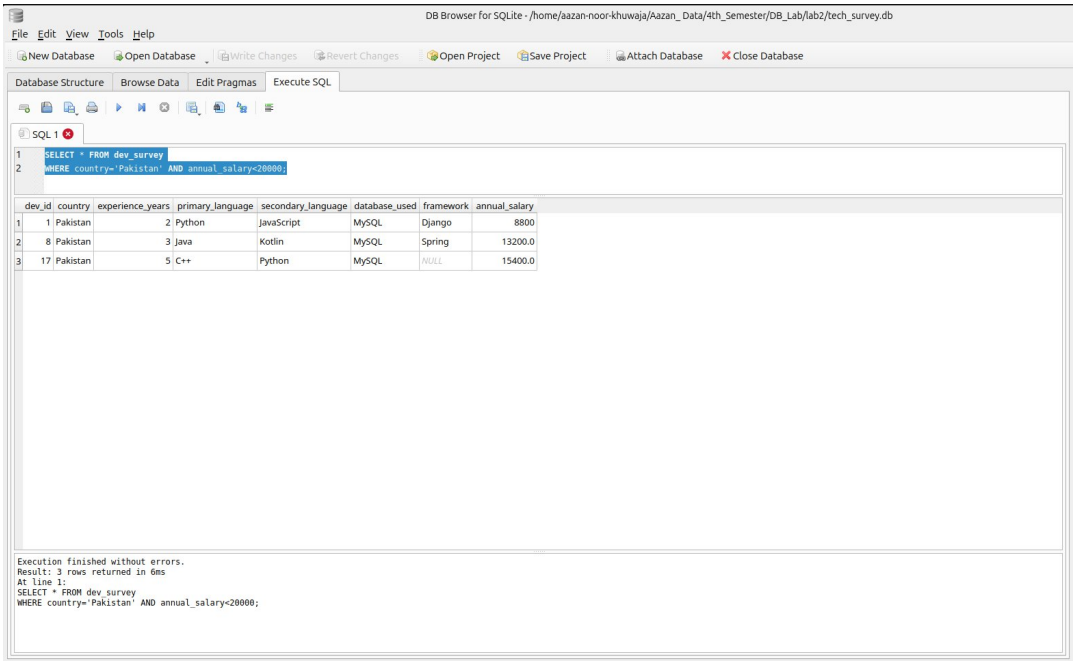


5. Show developers from Pakistan earning less than 20,000 USD:

Command:

```
SELECT * FROM dev_survey
WHERE country='Pakistan' AND annual_salary<20000;
```

Output:

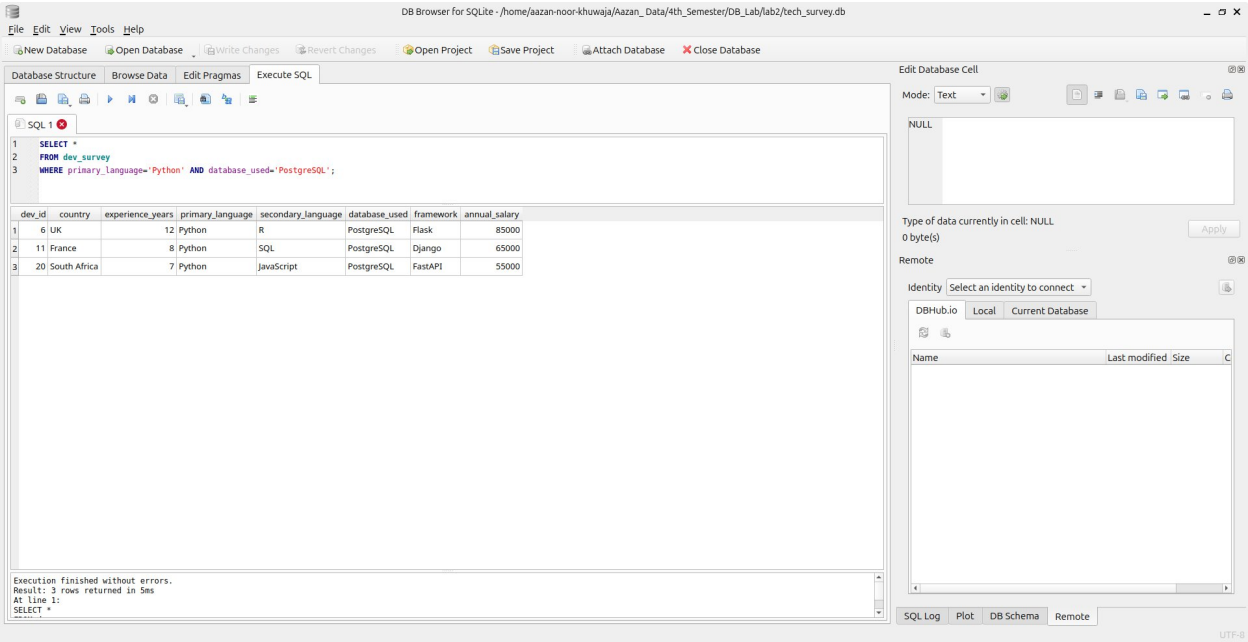


6. Show developers who use Python and PostgreSQL:

Command:

```
SELECT *

FROM dev_survey

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

Output:

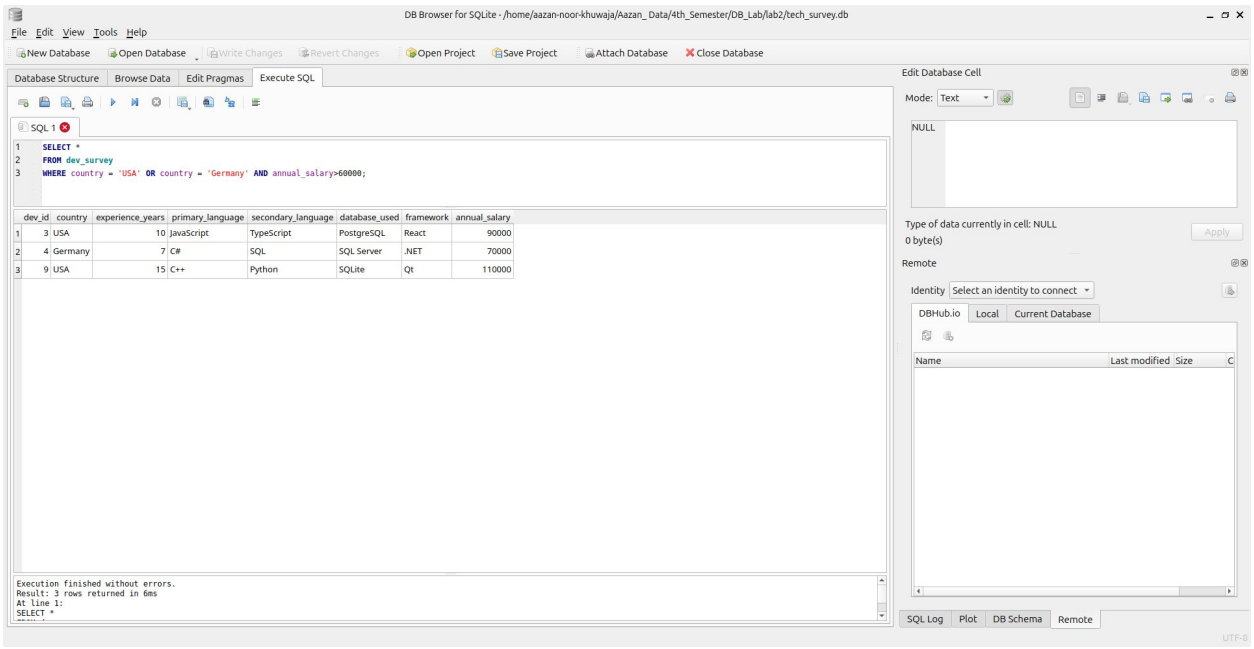


7. Show developers from USA or Germany earning above 60,000 USD:

Command:

```
SELECT *

FROM dev_survey

WHERE country = 'USA' OR country = 'Germany' AND annual_salary>60000;
```

Output:

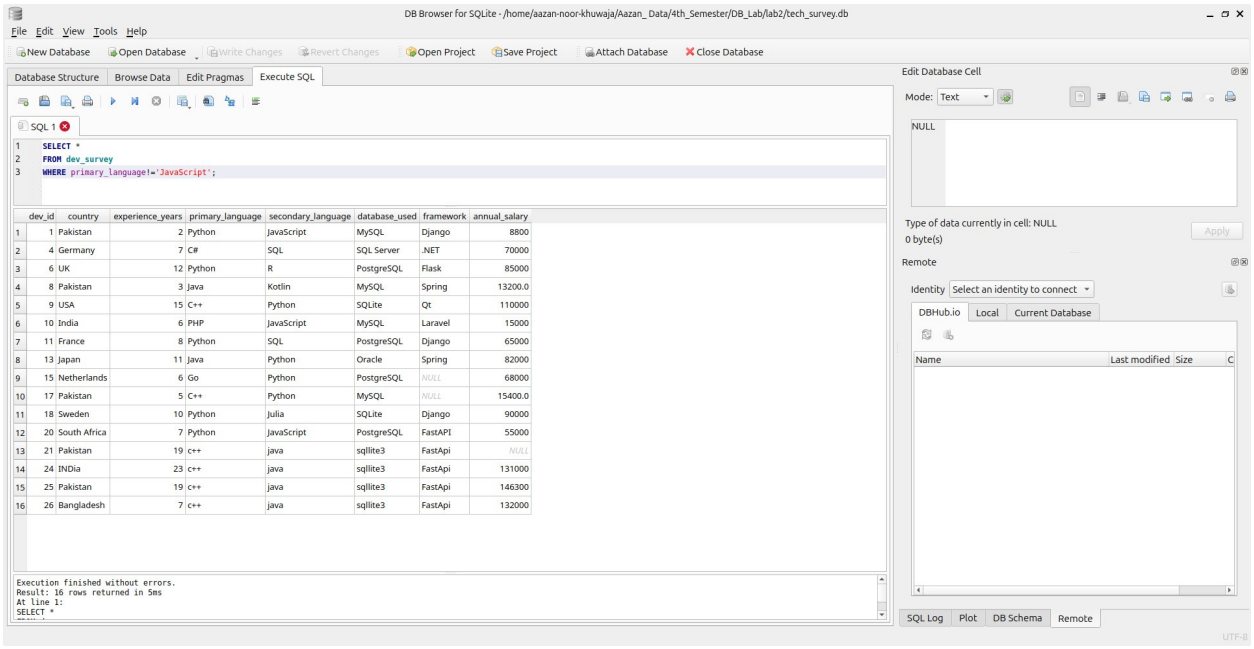


8. Show developers who do not use JavaScript:

Command:

```
SELECT *
FROM dev_survey
WHERE primary_language!='JavaScript';
```

Output:

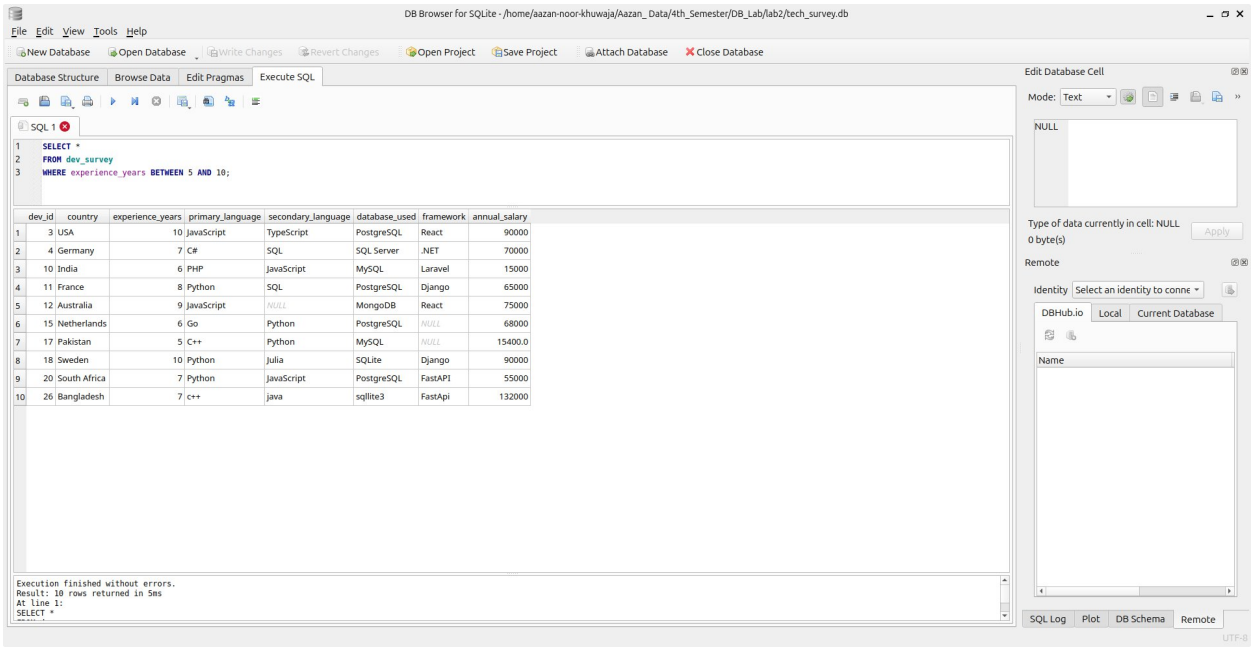


9. Show developers with experience between 5 and 10 years:

Command:

```
SELECT *
FROM dev_survey
WHERE experience_years BETWEEN 5 AND 10;
```

Output:

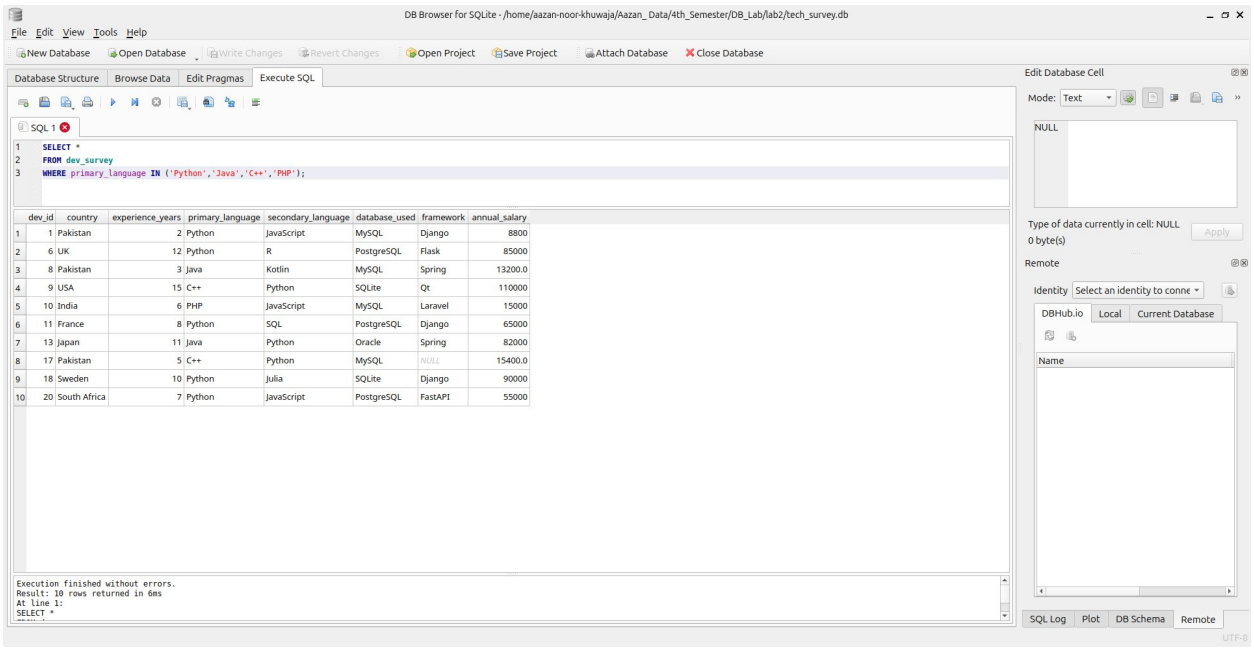


10. Show developers whose primary language is either one of Python, Java, C++,PHP:

Command:

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

Output:



11. Show developers whose framework starts with S:

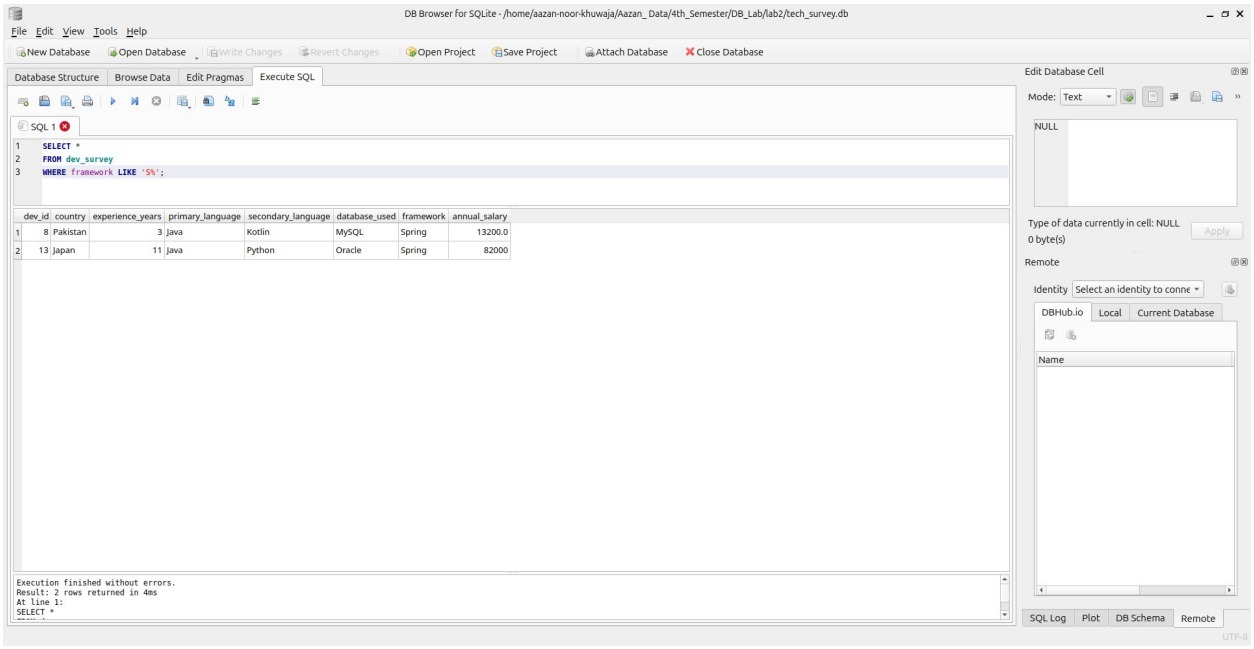
Command:

SELECT *

FROM dev_survey

WHERE framework LIKE 'S%';

Output:

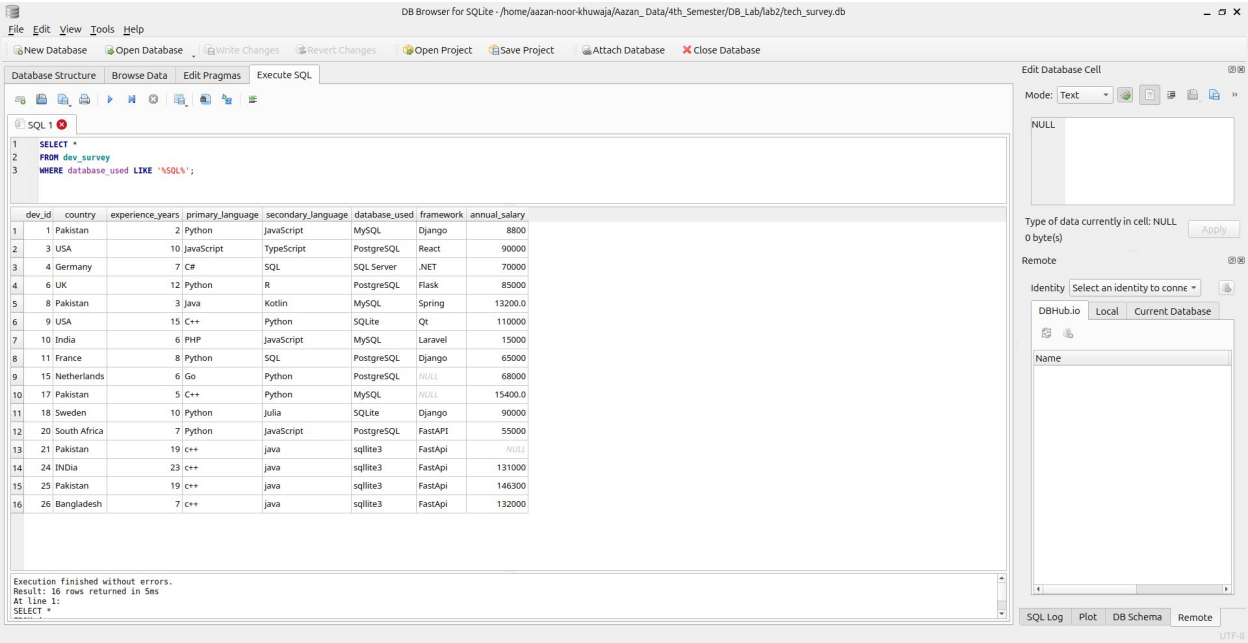


12. Show developers whose database contains the word SQL:

Command:

```
SELECT *

FROM dev_survey

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

Output:

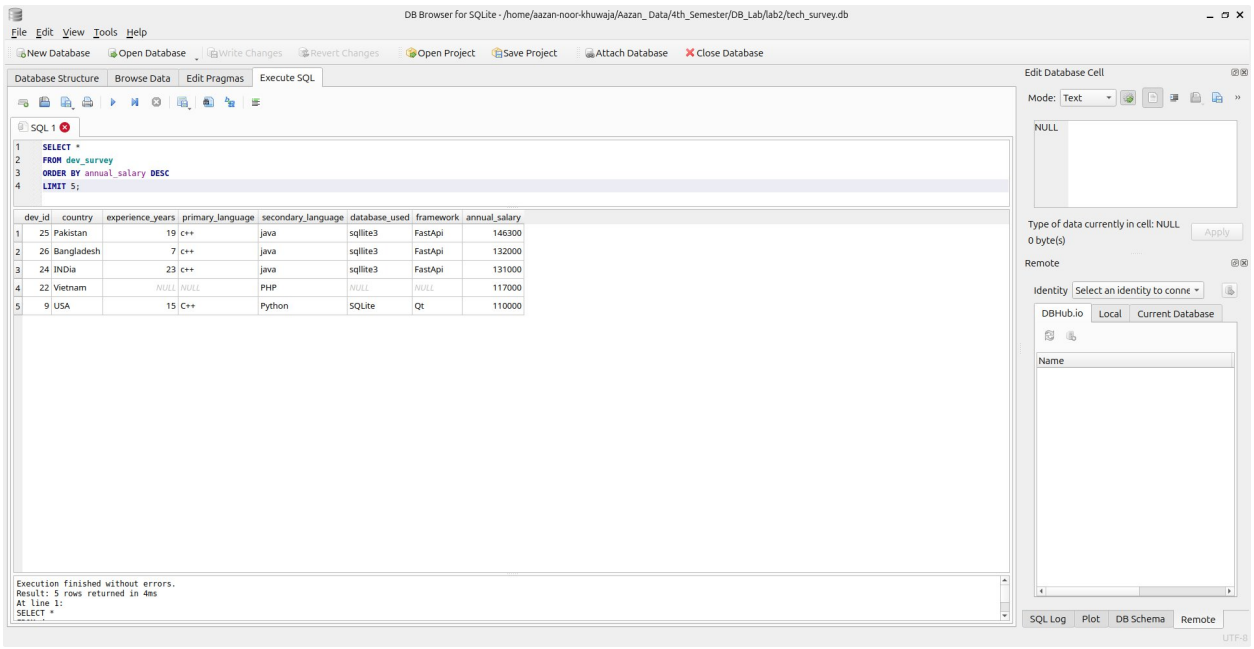


13. Show the top 5 highest-paid developers:

Command:

```
SELECT *

FROM dev_survey

ORDER BY annual_salary DESC

LIMIT 5;
```

Output:



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

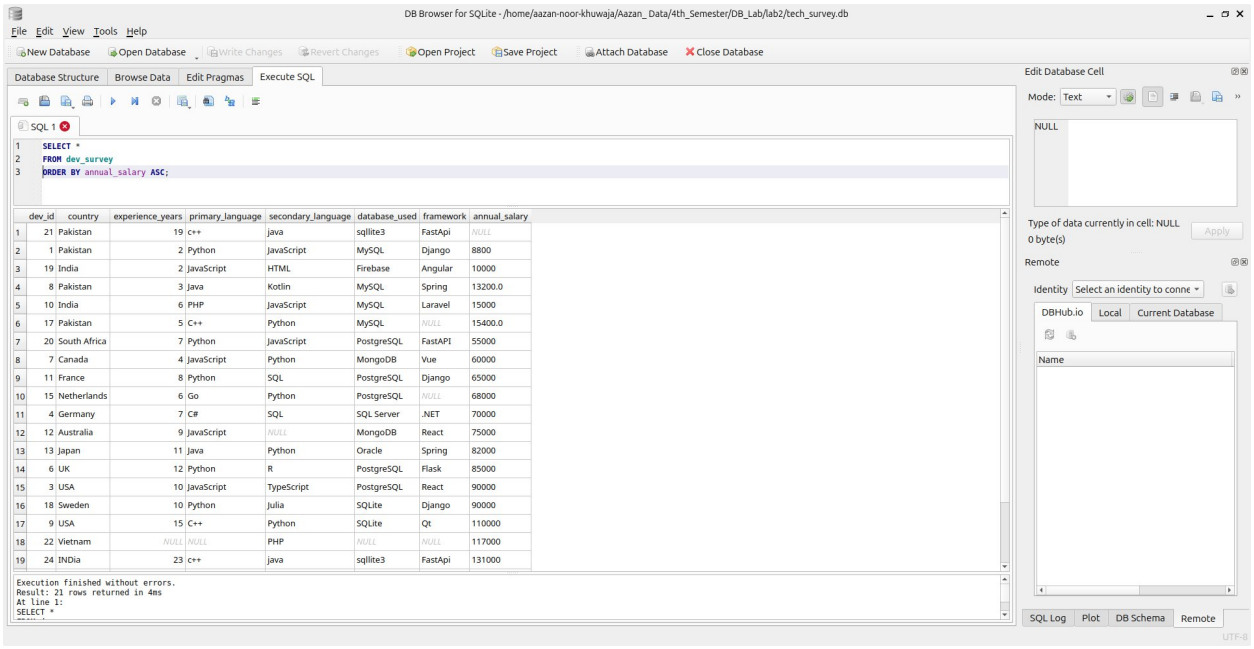
Command:

SELECT *

FROM dev_survey

ORDER BY annual_salary ASC;

Output:

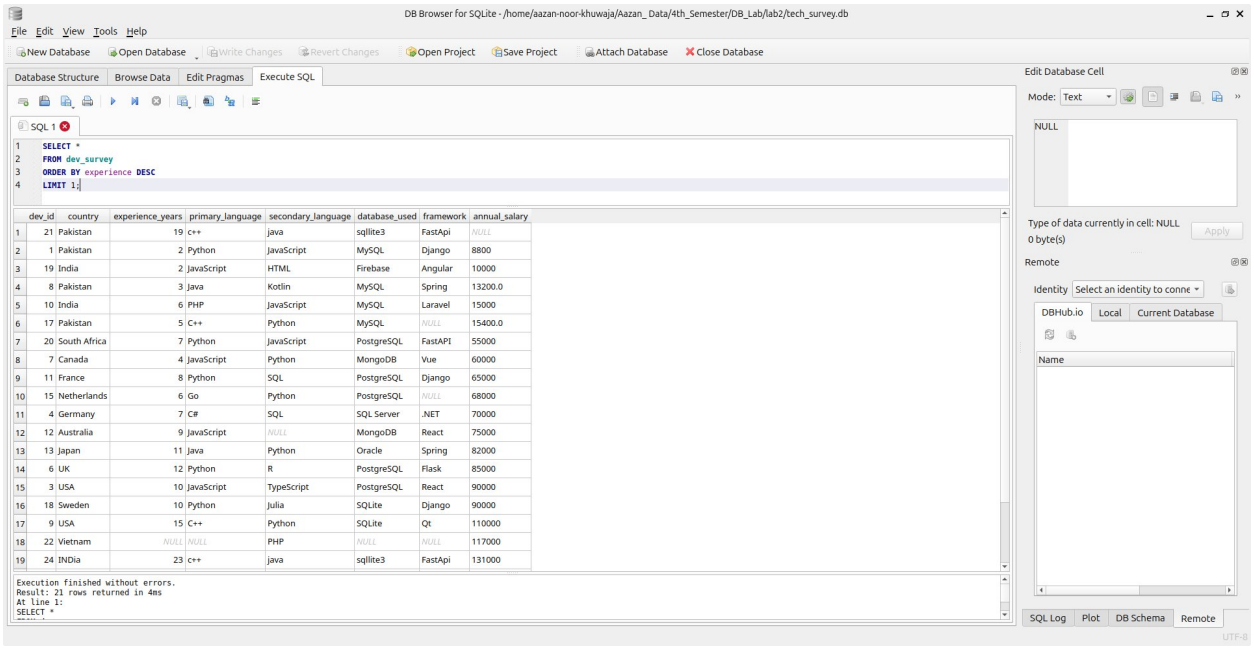


15. Show the only developer with the most experience:

Command:

```
SELECT *

FROM dev_survey

ORDER BY experience DESC

LIMIT 1;
```

Output:

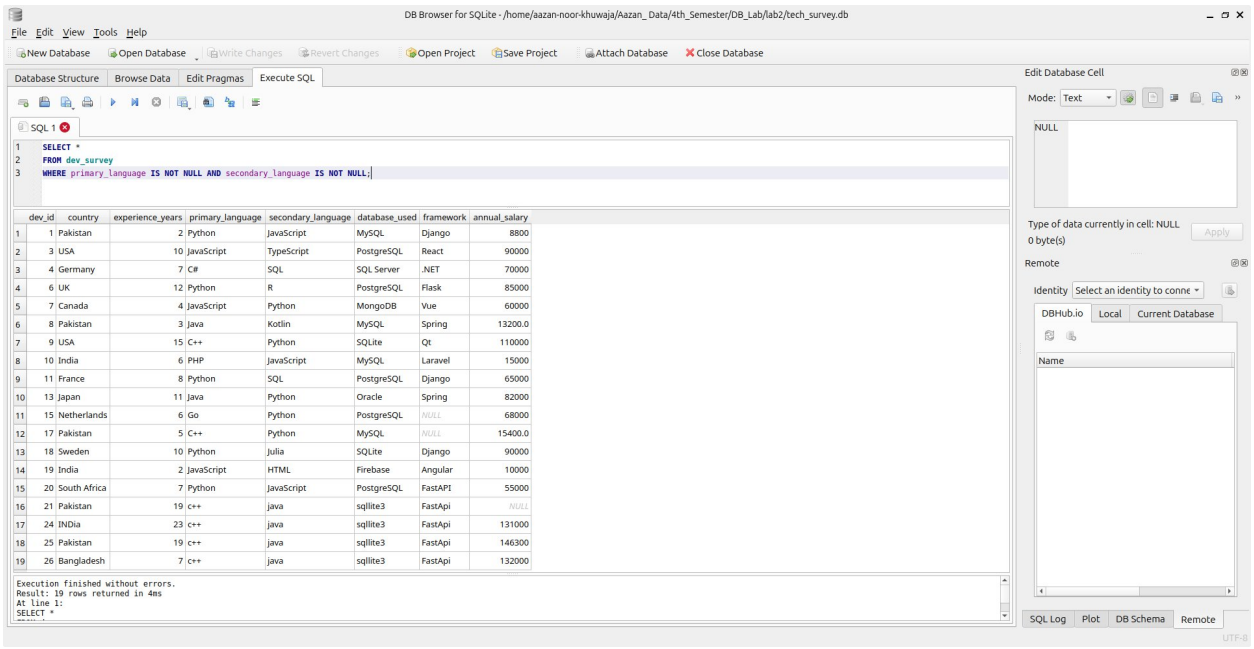


16. Show developers who use both primary and secondary languages:

Command:

```
SELECT *

FROM dev_survey

WHERE primary_language IS NOT NULL AND secondary_language IS NOT NULL;
```

Output:



17. Show developers where salary is not provided:

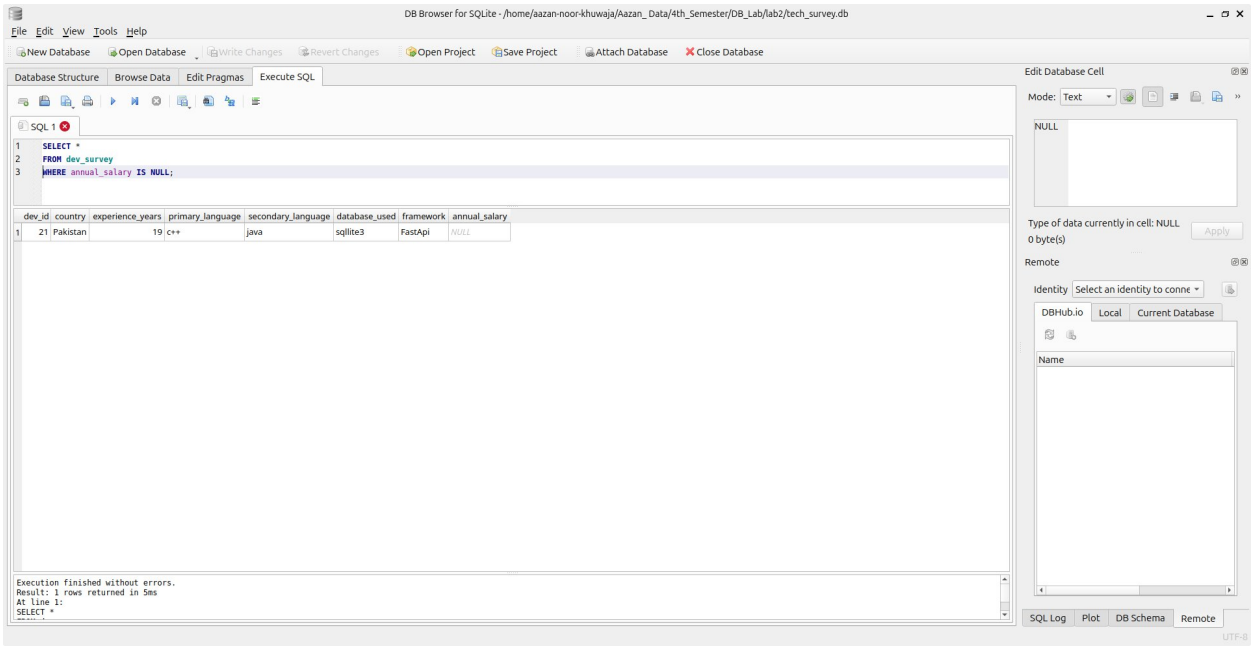
Command:

SELECT *

FROM dev_survey

WHERE annual_salary IS NULL;

Output:



18. Rank developers by salary within each country (sort based on two columns):

Command:

```
SELECT *

FROM dev_survey

ORDER BY country ASC,annual_salary DESC;
```

Output: