

Introduction to  
**Databases with SQL**  
Querying

1

**Database**

A collection of data organized for creating, reading, updating, and deleting

2

**Database Management System**

Software via which you can interact with a database.

3

MySQL

Oracle

PostgreSQL

SQLite

...

4

**SQL**

A language via which you can create, read, update, and delete data in a database

5

**Structured Query Language**

A language via which you can create, read, update, and delete data in a database

6

## SQL

A language via which you can create, read, update, and delete data in a database

7

## Querying

8

Which songs are most like the song  
a user just played?

9



10

Visual Studio Code

SQLite

...

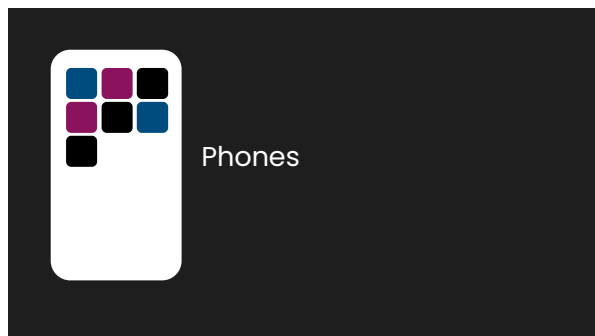
11

VS Code

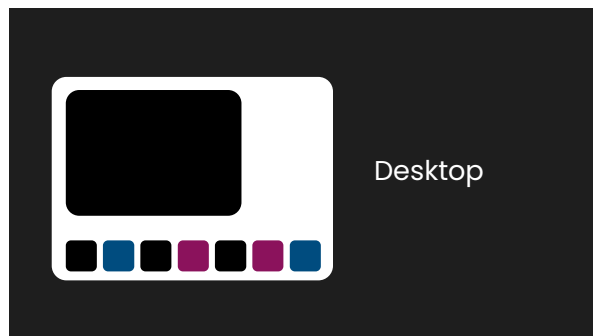
SQLite

...

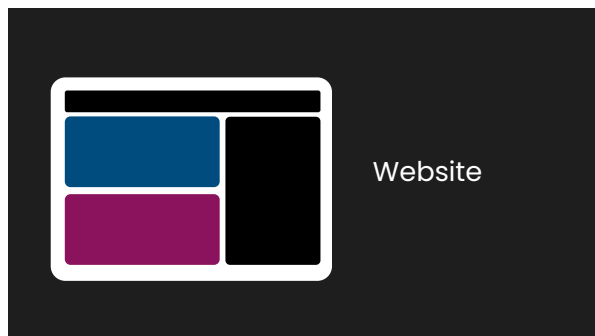
12



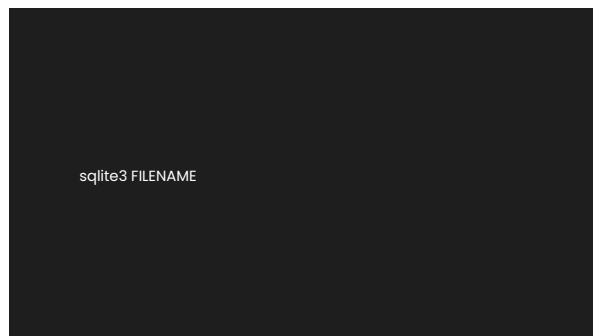
13



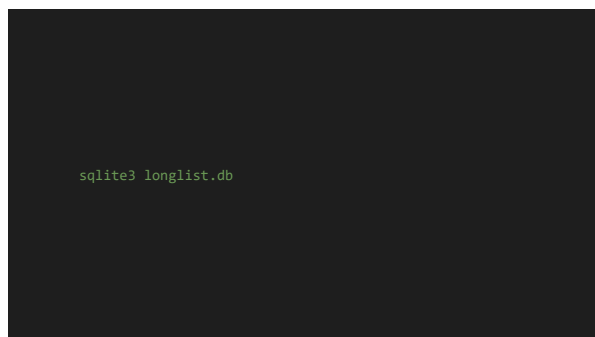
14



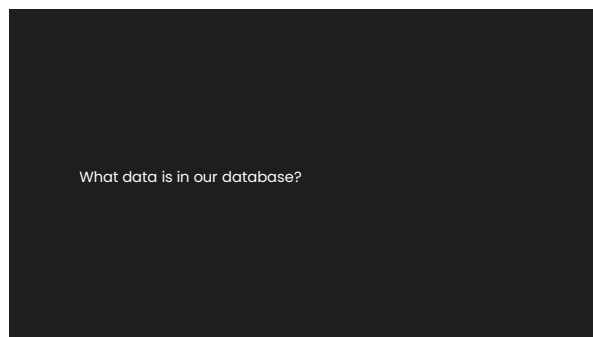
15



16



17



18

SELECT

19

```
SELECT * FROM "longlist";  
SELECT "title" FROM "longlist";  
SELECT "title", "author" FROM "longlist";  
SELECT "title", "author", "translator" FROM "longlist";
```

20

LIMIT

21

```
SELECT "title", "author" FROM "longlist" LIMIT 3;  
SELECT "title", "author" FROM "longlist" LIMIT 10;
```

22

WHERE

23

```
=  
!=  
<>
```

24

```
SELECT "title", "author" FROM "longlist"
WHERE "year" = 2023;

SELECT "title", "author" FROM "longlist"
WHERE "author" = 'Fernanda Melchor';

SELECT "title", "format" FROM "longlist"
WHERE "format" != 'hardcover';

SELECT "title", "format" FROM "longlist"
WHERE "format" <> 'hardcover';
```

25

NOT

26

```
SELECT "title", "format" FROM "longlist"
WHERE NOT "format" = 'hardcover';
```

27

Style

28

```
SELECT "title" FROM "longlist"
WHERE "author" = 'Fernanda Melchor' ;
```

29

```
SELECT "title" FROM "longlist"
WHERE "author" = 'Fernanda Melchor' ;
```

30

```
SELECT "title" FROM "longlist"  
WHERE "author" = 'Fernanda Melchor' ;
```

31

NULL

32

IS NULL  
IS NOT NULL

33

```
SELECT "title", "translator" FROM "longlist"  
WHERE "translator" IS NULL;  
  
SELECT "title", "translator" FROM "longlist"  
WHERE "translator" IS NOT NULL;
```

34

LIKE

35

%  
-

36

```
SELECT "title" FROM "longlist" WHERE "title"
LIKE '%love%';

SELECT "title" FROM "longlist" WHERE "title"
LIKE 'The%';

SELECT "title" FROM "longlist" WHERE "title"
LIKE 'The X';

SELECT "title" FROM "longlist" WHERE "title"
LIKE 'P_re';
```

37

AND  
OR  
)

38

```
SELECT "title", "year" FROM "longlist" WHERE
"year" = 2022 OR "year" = 2023;

SELECT "title", "year" FROM "longlist" WHERE
("year" = 2022 OR "year" = 2023) AND "format" = 'hardcover';

SELECT "title", "year" FROM "longlist" WHERE
"year" = 2019 OR "year" = 2020 OR "year" = 2021 OR "year" = 2022;
```

39

>  
<  
>=  
<=

40

```
SELECT "title", "year" FROM "longlist" WHERE
"year" >= 2019 AND "year" <= 2022;

SELECT "title", "rating" FROM "longlist" WHERE
"rating" > 4.0;

SELECT "title", "rating" FROM "longlist" WHERE
"rating" > 4.0 AND "votes" > 1000;

SELECT "title", "pages" FROM "longlist" WHERE
"pages" < 300;
```

41

BETWEEN ... AND ...

42

```
SELECT "title", "year" FROM "longlist"
WHERE "year" BETWEEN 2019 AND 2022;

SELECT "title", "published" FROM "longlist";

SELECT "title", "published" FROM "longlist"
WHERE "published" BETWEEN date('2022-05-01') AND date('2022-08-01');
```

43

ORDER BY

44

```
SELECT "title", "rating" FROM "longlist" ORDER BY
"rating" LIMIT 10;
```

45

ORDER BY ... ASC

ORDER BY ... DESC

46

```
SELECT "title", "rating" FROM "longlist" ORDER BY
"rating" DESC LIMIT 10;

SELECT "title", "rating", "votes" FROM "longlist" ORDER BY
"rating" DESC, "votes" DESC LIMIT 10;

SELECT "title", "rating" FROM "longlist"
WHERE "votes" > 10000 ORDER BY "rating" DESC LIMIT 10;
```

47

COUNT

AVG

MIN

MAX

SUM

48



```
SELECT AVG("rating") FROM "longlist";  
SELECT MAX("rating") FROM "longlist";  
SELECT MIN("rating") FROM "longlist";  
SELECT SUM("votes") FROM "longlist";  
SELECT COUNT(*) FROM "longlist";  
SELECT COUNT("translator") FROM "longlist";  
SELECT COUNT("publisher") FROM "longlist";
```

49

ROUND

50

```
SELECT ROUND(AVG("rating"), 2) FROM "longlist";  
SELECT ROUND(AVG("rating"), 2) AS "Average Rating" FROM "longlist";
```

51

DISTINCT

52

```
SELECT COUNT(DISTINCT "publisher") FROM "longlist";
```

53

.quit

54

Summary

55

```
SELECT column FROM table;
```

56

```
SELECT COUNT(column) FROM table;
```

57

```
SELECT AVG(column) FROM table;
```

58

```
SELECT column FROM table  
WHERE condition;
```

59

```
SELECT column FROM table  
WHERE column = value;
```

60

```
SELECT column FROM table  
WHERE column LIKE pattern;
```

61

```
SELECT column FROM table  
WHERE condition0 AND condition1;
```

62

```
SELECT column FROM table  
WHERE condition0 OR condition1;
```

63

```
SELECT column FROM table  
WHERE condition  
ORDER BY column;
```

64

```
SELECT column FROM table  
WHERE condition  
ORDER BY column  
LIMIT number;
```

65