

Modul 3 – Android App Entwicklung mit Kotlin

# SQL Basics

# Gliederung

- Relationale Datenbank
- SQL
- Beispiel



Quelle: <https://makeameme.org/meme/herst-jetzt-geht-b5v81u>

# Relationale Datenbank

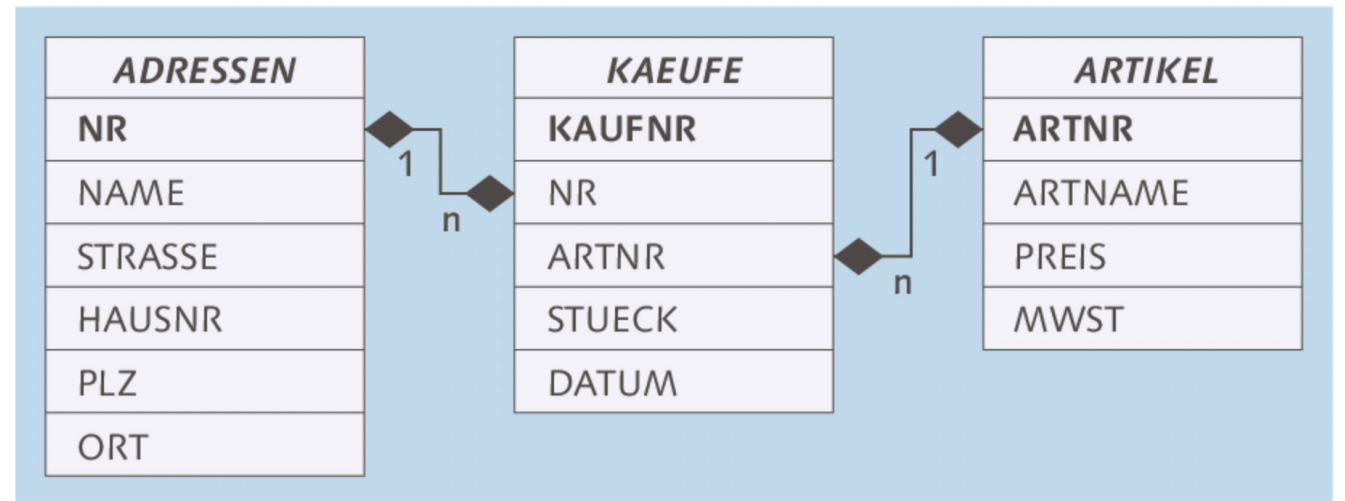
**relational** – eine Beziehung darstellend

Tabelle kann Verweis auf andere Tabelle haben

Datenbank ist eine einfach strukturierte

Sammlung von Daten

In Apps häufig verwendet um Daten beim  
nächsten öffnen schnell zur Verfügung zu stellen  
(auch Offline)



Quelle: [https://openbook.rheinwerk-verlag.de/it\\_handbuch/12\\_001.html](https://openbook.rheinwerk-verlag.de/it_handbuch/12_001.html)

# Relationale Datenbank

Tabellen sind ähnlich wie **Klassen** in Kotlin

**Spalten** sind wie **Klassenvariablen** und benötigen auch einen Namen und einen Datentyp

**Reihen** sind wie **Instanzen** (konkrete Ausführung) einer Klasse

Jede Reihe benötigt einen **Primärschlüssel** (primary key) der meistens **id** genannt wird

	id	fact	length
1	19	A cat only has the ability to move their jaw up and down, not s	93
2	20	In the original Italian version of Cinderella, the benevolent fairy	95
3	21	The largest breed of cat is the Ragdoll with males weighing in :	209
4	22	A cat's appetite is the barometer of its health. Any cat that doe	132
5	23	Cats dislike citrus scent.	26
6	24	A tomcat (male cat) can begin mating when he is between 7 an	76
7	25	Statistics indicate that animal lovers in recent years have show	98
8	26	Cats can be right-pawed or left-pawed.	38
9	27	Cats make about 100 different sounds. Dogs make only about ´	62
10	28	In an average year, cat owners in the United States spend over	86

# SQL

Structured Query Language

wird benötigt um mit relationaler **Datenbank** zu kommunizieren



Quelle: <https://italiancoders.it/wp-content/uploads/2017/10/sql-1.png>

# SQL

Wichtigste Anweisungen

**SELECT** - ruft spezifische Informationen aus Datentabelle ab  
und Ergebnisse können gefiltert werden

**INSERT** - fügt eine neue Zeile in eine Tabelle

**UPDATE** - aktualisiert eine vorhandener Zeile

**DELETE** - entfernt vorhandener Zeile Zeilen von Tabelle

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Quelle: <https://italiancoders.it/wp-content/uploads/2017/10/sql-1.png>

# Beispiel: CatFacts

- **SELECT** Anweisungen um ein oder mehrere bestimmte Catfact zu bekommen
- **INSERT** Anweisung um einen neuen CatFact hinzuzufügen
- **UPDATE** Anweisung um vorhandene CatFact zu ändern
- **DELETE** Anweisung um ein oder mehrere CatFacts zu löschen

The richest cat is Blackie who was left £15 million by his owner, Ben Rea.

GO TO OTHER

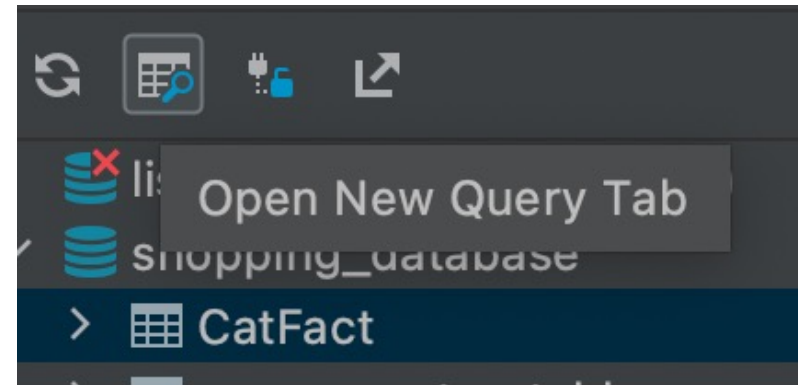
NEW FACT

CLEAR DATA

# Gesamte Tabelle

```
SELECT * FROM CatFact
```

Wähle **alle Spalten** von CatFact aus ohne eine bestimmte Auswahl an Zeilen zu treffen

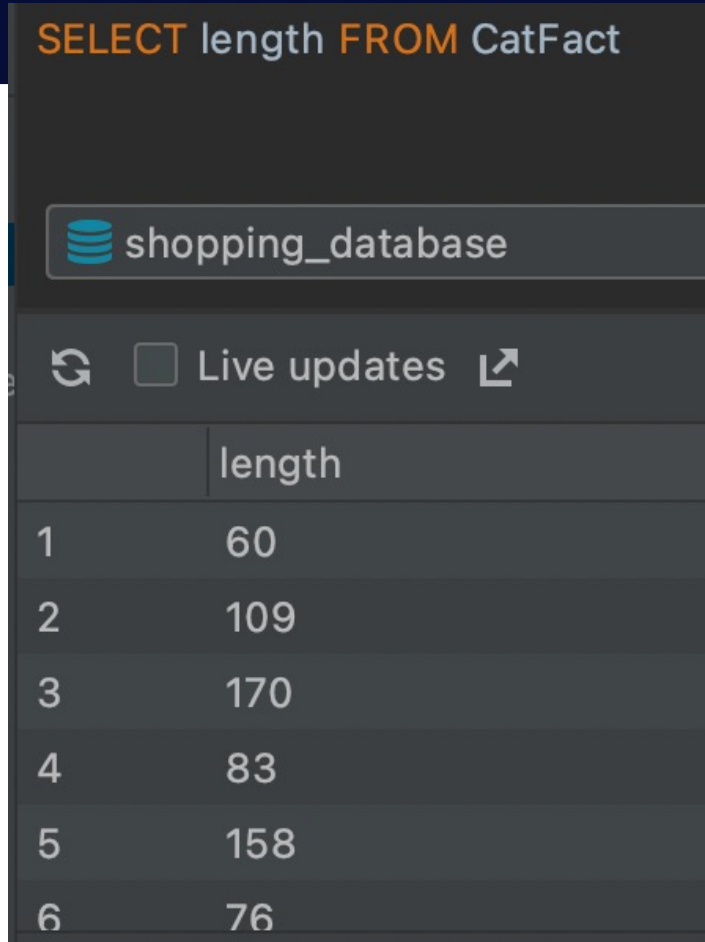
A screenshot of a database query results window. The title bar says 'New Query [2]'. The query 'SELECT \* FROM CatFact' is entered. The database 'shopping\_database' is selected. There's a 'Live updates' checkbox. The results are shown in a table with columns 'id', 'fact', and 'length'. The table contains 6 rows of data. At the bottom, it says 'Results are read-only'.



# nur Länge von allen

```
SELECT length FROM CatFact
```

Wähle nur die Spalte **length** von CatFact aus ohne eine Bestimmte Auswahl an Zeilen zu treffen



The screenshot shows a database query interface. At the top, the query `SELECT length FROM CatFact` is entered. Below it, the database name `shopping_database` is selected. There are controls for refreshing the query and a checkbox for "Live updates". The results are displayed in a table with two columns: an index and the `length` value.

	length
1	60
2	109
3	170
4	83
5	158
6	76

# Zeilen mit Auswahl

```
SELECT length, fact FROM CatFact
WHERE length < 100
```

Wähle nur die Spalten **length** und **fact** von CatFact aus  
und wähle nur jene aus wo **length** kleiner 100 ist

```
SELECT length, fact FROM CatFact WHERE length < 100
```

shopping\_database

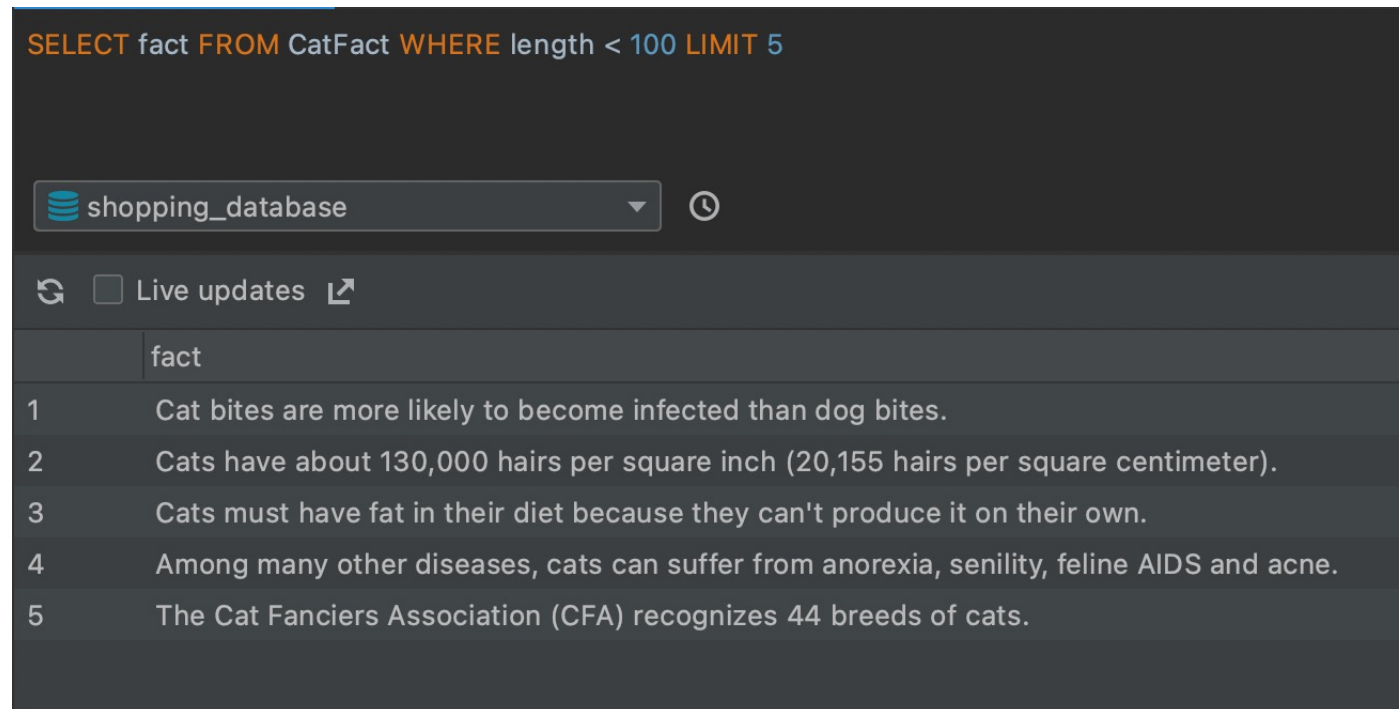
Live updates

	length	fact
1	60	Cat bites are more likely to become infected than dog bites
2	83	Cats have about 130,000 hairs per square inch (20,155 ha
3	76	Cats must have fat in their diet because they can't produ
4	89	Among many other diseases, cats can suffer from anorexi
5	64	The Cat Fanciers Association (CFA) recognizes 44 breeds
6	61	Florence Nightingale owned more than 60 cats in her lifet
7	85	A 2007 Gallup poll revealed that both men and women we
8	28	Cats have supersonic hearing
9	74	A cat's jaw can't move sideways, so a cat can't chew large
10	70	A cat has more bones than a human; humans have 206, an
11	50	Tylenol and chocolate are both poisonous to cats.
12	41	Cats have the largest eyes of any mammal.
13	71	The cat's footpads absorb the shocks of the landing wher
14	54	About 37% of American homes today have at least 1 cat.
15	71	The cat's footpads absorb the shocks of the landing wher
16	61	It's not just the cat's footpads that absorb the shocks of

# Zeilen mit Auswahl

```
SELECT fact FROM CatFact WHERE  
length < 100 LIMIT 5
```

Wähle nur die Spalte **fact** von CatFact aus und  
wähle nur 5 aus wo **length** kleiner 100 ist



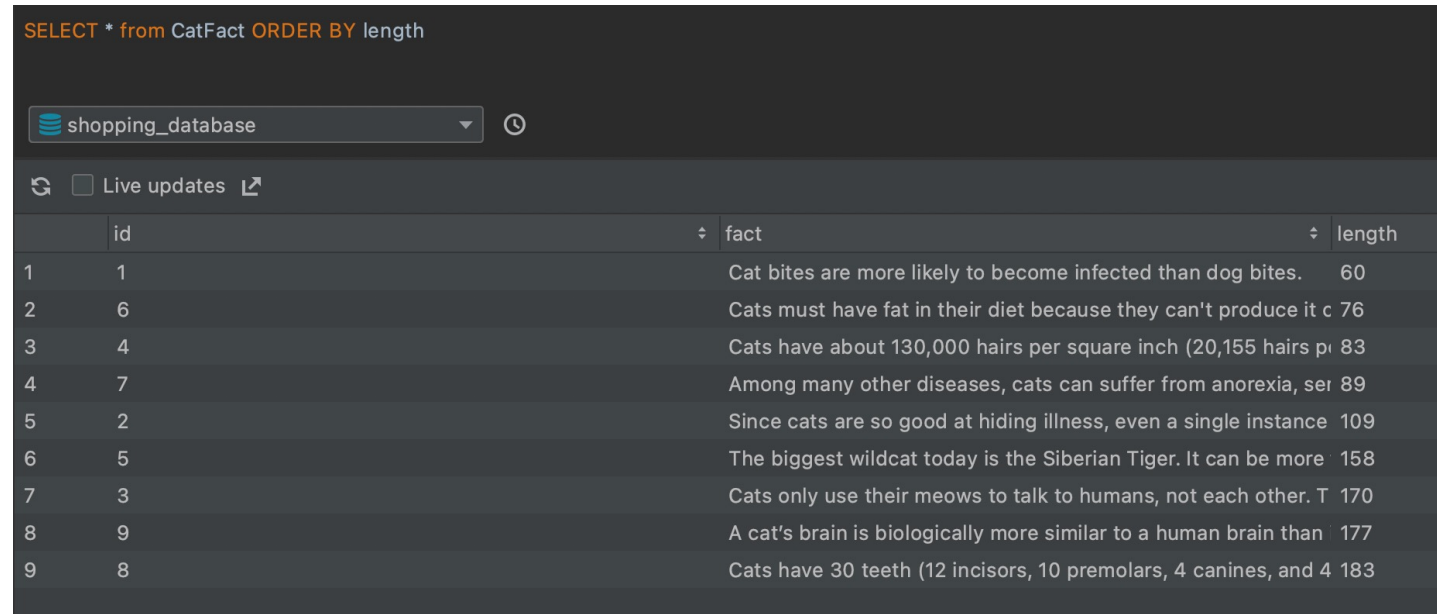
The screenshot shows a database query interface. At the top, the SQL query is entered: `SELECT fact FROM CatFact WHERE length < 100 LIMIT 5`. Below the query, there is a dropdown menu showing the database name 'shopping\_database' and a clock icon. Underneath, there is a checkbox for 'Live updates' which is currently unchecked. The results are displayed in a table with a single column 'fact'.

	fact
1	Cat bites are more likely to become infected than dog bites.
2	Cats have about 130,000 hairs per square inch (20,155 hairs per square centimeter).
3	Cats must have fat in their diet because they can't produce it on their own.
4	Among many other diseases, cats can suffer from anorexia, senility, feline AIDS and acne.
5	The Cat Fanciers Association (CFA) recognizes 44 breeds of cats.

# Zeilen sortieren

```
SELECT * FROM CatFact ORDER  
BY length
```

Wähle **alle Spalten** von CatFact aus ohne  
eine bestimmte Auswahl an Zeilen zu  
treffen und **sortiere** sie nach **length**



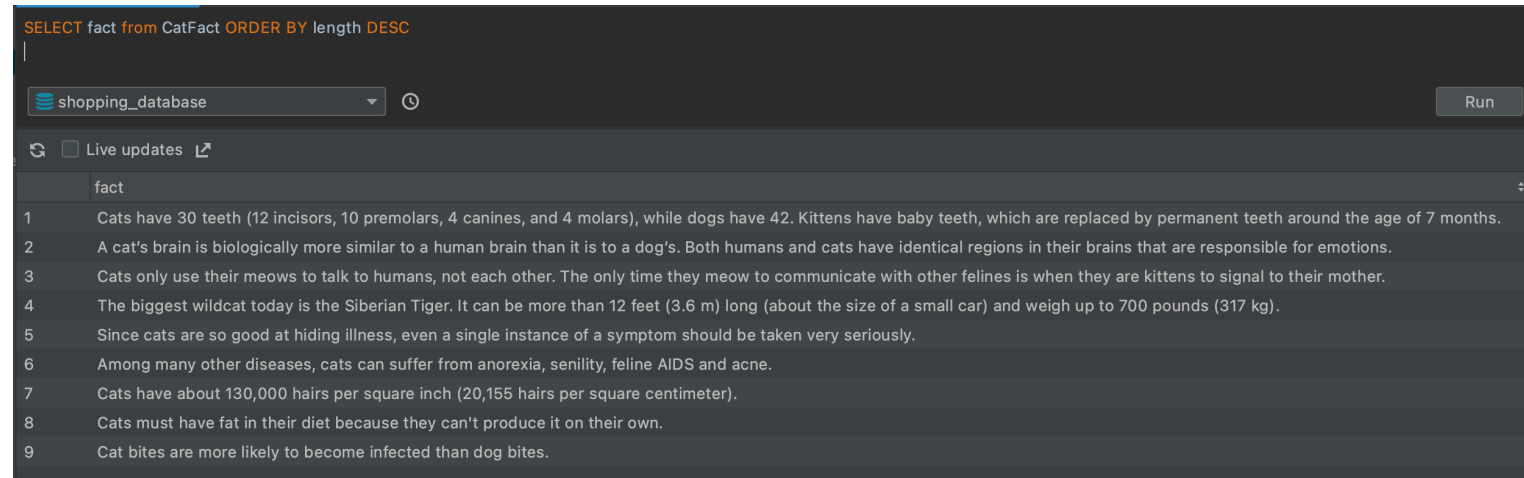
The screenshot shows a database query interface. At the top, the SQL query is entered: `SELECT * from CatFact ORDER BY length`. Below the query, a dropdown menu shows the selected database: `shopping_database`. There is a checkbox for `Live updates` which is currently unchecked. Below the interface, the results are displayed in a table with 9 rows. The table has four columns: an index, `id`, `fact`, and `length`. The rows are sorted by the `length` column in ascending order.

	id	fact	length
1	1	Cat bites are more likely to become infected than dog bites.	60
2	6	Cats must have fat in their diet because they can't produce it c	76
3	4	Cats have about 130,000 hairs per square inch (20,155 hairs p	83
4	7	Among many other diseases, cats can suffer from anorexia, ser	89
5	2	Since cats are so good at hiding illness, even a single instance	109
6	5	The biggest wildcat today is the Siberian Tiger. It can be more	158
7	3	Cats only use their meows to talk to humans, not each other. T	170
8	9	A cat's brain is biologically more similar to a human brain than	177
9	8	Cats have 30 teeth (12 incisors, 10 premolars, 4 canines, and 4	183

# Zeilen sortieren absteigend

```
SELECT fact from CatFact ORDER  
BY length DESC
```

Wähle **fact** von CatFact aus ohne eine bestimmte Auswahl an Zeilen zu treffen und **sortiere** sie nach **length** absteigend



# Neue Zeile einfügen

```
INSERT INTO CatFact
VALUES (null, „hahahaha“, 8)
```

Füge eine neue Zeile in CatFact ein, mit den Werten `null` für `id`, `„hahahaha“` für `fact` und `8` für `length`

`id` wird automatisch von Datenbank generiert

1	1	Cat bites are more likely to become infected than dog bites.	60
2	2	Since cats are so good at hiding illness, even a single instance	109
3	3	Cats only use their meows to talk to humans, not each other. T	170
4	4	Cats have about 130,000 hairs per square inch (20,155 hairs p	83
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8	8	Cats have 30 teeth (12 incisors, 10 premolars, 4 canines, and 4	183
9	9	A cat's brain is biologically more similar to a human brain than	177
10	10	hahahaha	8

# Zeile ändern

```
UPDATE CatFact SET fact = "A cat is a cat.", length = 12
WHERE id = 8
```

Ändere die Zeile in CatFact, mit den Werten  
„A cat is a cat.“ für fact und 12 für length, wo  
die id 8 entspricht

1	1	Cat bites are more likely to become infected than dog bites.	60
2	2	Since cats are so good at hiding illness, even a single instance	109
3	3	Cats only use their meows to talk to humans, not each other. T	170
4	4	Cats have about 130,000 hairs per square inch (20,155 hairs p	83
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6	6	Cats must have fat in their diet because they can't produce it c	76
7	7	Among many other diseases, cats can suffer from anorexia, sei	89
8	8	A cat is a cat.	12
9	9	A cat's brain is biologically more similar to a human brain than	177
10	10	hahahaha	8

# Zeile löschen

```
DELETE FROM CatFact WHERE length = 12
```

Lösche alle Zeilen in CatFact mit dem Wert  
12 für length

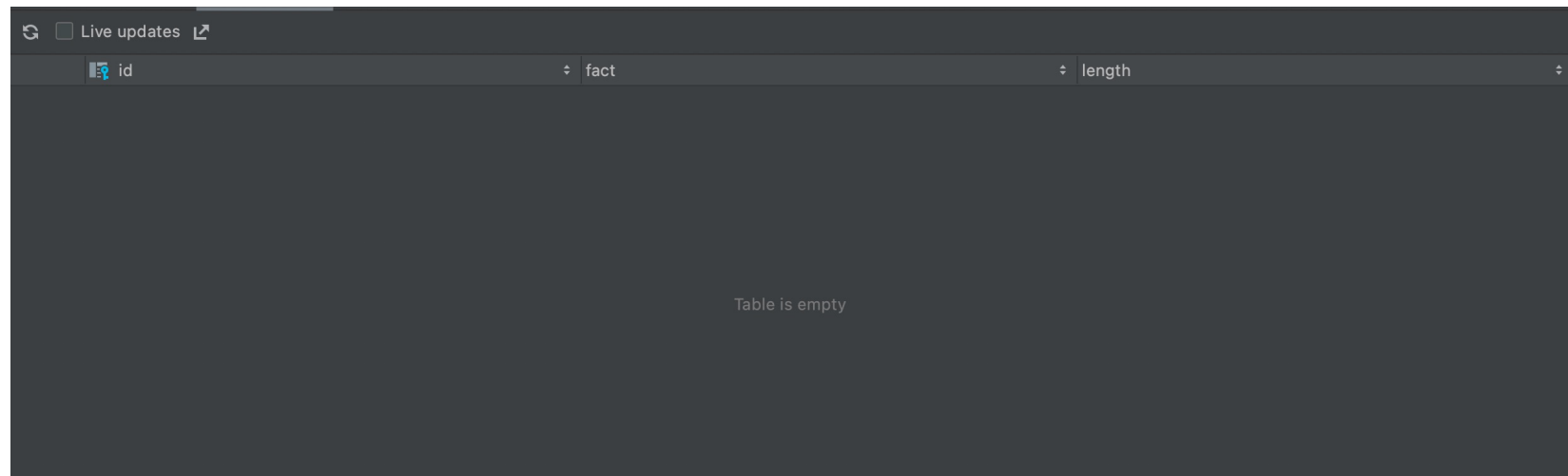
1	1	Cat bites are more likely to become infected than dog bites.	60
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8	9	A cat's brain is biologically more similar to a human brain than	177
9	10	hahahaha	8
10	11	haha	4



# Alle Zeilen löschen

```
DELETE FROM CatFact
```

Lösche alle Zeilen in CatFact



id fact length

Table is empty

# SQL Basics

## Wiederholung - Was haben wir heute gelernt?

1

Relationale Datenbank

2

SQL

3

SELECT, INSERT, UPDATE, DELETE

3 Database SQL walked into  
a NoSQL bar.

A little while later...  
they walked out

Because they couldn't find a table.

# Viel Spaß!

Quelle: <https://devrant.com/rants/1944941/haha-old-but-still-funny>