# Big Data lab1

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In [1]:

```
import sqlite3
conn = sqlite3.connect('/Users/jr/Desktop/1004_Big_Data/lab/lab_sqlite3/Sample_Song_Dataset.db')
cursor = conn.cursor()
# We use a "cursor" to mark our place in the database.
# We could use multiple cursors to keep track of multiple
# queries simultaneously.
```

In [7]:

```
import pandas as pd
```

- 1.Find id, name and term of the artist who played the track with id TRMMWLD128F9301BF2

In [3]:

```
t = ('TRMMWLD128F9301BF2',)
string = """
SELECT
    artists.artist_id,
    artists.artist_name,
    artist_term.term
FROM artists
INNER JOIN tracks
ON artists.artist_id = tracks.artist_id
INNER JOIN artist_term
ON tracks.artist_id = artist_term.artist_id
WHERE tracks.track_id=?
"""
cursor.execute(string, t)
#because the condition is on the third table, and all three tables share the same artist_id,
#so we need to use INNER JOIN and then select attributes we want from the joined table
#based on the condtion on the third table
for r in cursor:
    print(r)
```

```
('ARE592P1187B99F3A7', 'Tone X', 'alternative rock')
('ARE592P1187B99F3A7', 'Tone X', 'american')
('ARE592P1187B99F3A7', 'Tone X', 'black gospel')
('ARE592P1187B99F3A7', 'Tone X', 'black music')
('ARE592P1187B99F3A7', 'Tone X', 'christian')
('ARE592P1187B99F3A7', 'Tone X', 'contemporary christian')
('ARE592P1187B99F3A7', 'Tone X', 'contemporary gospel')
('ARE592P1187B99F3A7', 'Tone X', 'dance')
('ARE592P1187B99F3A7', 'Tone X', 'electronic')
('ARE592P1187B99F3A7', 'Tone X', 'funk')
('ARE592P1187B99F3A7', 'Tone X', 'funk soul')
('ARE592P1187B99F3A7', 'Tone X', 'gospel')
('ARE592P1187B99F3A7', 'Tone X', 'gospel jams')
('ARE592P1187B99F3A7', 'Tone X', 'gospel soul')
('ARE592P1187B99F3A7', 'Tone X', 'hip hop')
('ARE592P1187B99F3A7', 'Tone X', 'house')
('ARE592P1187B99F3A7', 'Tone X', 'jazz')
('ARE592P1187B99F3A7', 'Tone X', 'latin')
('ARE592P1187B99F3A7', 'Tone X', 'male vocalist')
('ARE592P1187B99F3A7', 'Tone X', 'pop')
('ARE592P1187B99F3A7', 'Tone X', 'r&b')
('ARE592P1187B99F3A7', 'Tone X', 'religious music')
('ARE592P1187B99F3A7', 'Tone X', 'rock')
('ARE592P1187B99F3A7', 'Tone X', 'salsa')
('ARE592P1187B99F3A7', 'Tone X', 'san diego')
('ARE592P1187B99F3A7', 'Tone X', 'smooth jazz')
('ARE592P1187B99F3A7', 'Tone X', 'soul')
('ARE592P1187B99F3A7', 'Tone X', 'syntax records')
('ARE592P1187B99F3A7', 'Tone X', 'techno')
('ARE592P1187B99F3A7', 'Tone X', 'united states')
('ARE592P1187B99F3A7', 'Tone X', 'urban')
('ARE592P1187B99F3A7', 'Tonex', 'alternative rock')
('ARE592P1187B99F3A7', 'Tonex', 'american')
('ARE592P1187B99F3A7', 'Tonex', 'black gospel')
('ARE592P1187B99F3A7', 'Tonex', 'black music')
('ARE592P1187B99F3A7', 'Tonex', 'christian')
('ARE592P1187B99F3A7', 'Tonex', 'contemporary christian')
('ARE592P1187B99F3A7', 'Tonex', 'contemporary gospel')
('ARE592P1187B99F3A7', 'Tonex', 'dance')
('ARE592P1187B99F3A7', 'Tonex', 'electronic')
('ARE592P1187B99F3A7', 'Tonex', 'funk')
('ARE592P1187B99F3A7', 'Tonex', 'funk soul')
('ARE592P1187B99F3A7', 'Tonex', 'gospel')
('ARE592P1187B99F3A7', 'Tonex', 'gospel jams')
('ARE592P1187B99F3A7', 'Tonex', 'gospel soul')
('ARE592P1187B99F3A7', 'Tonex', 'hip hop')
('ARE592P1187B99F3A7', 'Tonex', 'house')
('ARE592P1187B99F3A7', 'Tonex', 'jazz')
('ARE592P1187B99F3A7', 'Tonex', 'latin')
('ARE592P1187B99F3A7', 'Tonex', 'male vocalist')
('ARE592P1187B99F3A7', 'Tonex', 'pop')
('ARE592P1187B99F3A7', 'Tonex', 'r&b')
('ARE592P1187B99F3A7', 'Tonex', 'religious music')
('ARE592P1187B99F3A7', 'Tonex', 'rock')
('ARE592P1187B99F3A7', 'Tonex', 'salsa')
('ARE592P1187B99F3A7', 'Tonex', 'san diego')
('ARE592P1187B99F3A7', 'Tonex', 'smooth jazz')
('ARE592P1187B99F3A7', 'Tonex', 'soul')
('ARE592P1187B99F3A7', 'Tonex', 'syntax records')
('ARE592P1187B99F3A7', 'Tonex', 'techno')
('ARE592P1187B99F3A7', 'Tonex', 'united states')
('ARE592P1187B99F3A7', 'Tonex', 'urban')
('ARE592P1187B99F3A7', 'Tonéx', 'alternative rock')
('ARE592P1187B99F3A7', 'Tonéx', 'american')
```

```
('ARE592P1187B99F3A7', 'Tonéx', 'black gospel')
('ARE592P1187B99F3A7', 'Tonéx', 'black music')
('ARE592P1187B99F3A7', 'Tonéx', 'christian')
('ARE592P1187B99F3A7', 'Tonéx', 'contemporary christian')
('ARE592P1187B99F3A7', 'Tonéx', 'contemporary gospel')
('ARE592P1187B99F3A7', 'Tonéx', 'dance')
('ARE592P1187B99F3A7', 'Tonéx', 'electronic')
('ARE592P1187B99F3A7', 'Tonéx', 'funk')
('ARE592P1187B99F3A7', 'Tonéx', 'funk soul')
('ARE592P1187B99F3A7', 'Tonéx', 'gospel')
('ARE592P1187B99F3A7', 'Tonéx', 'gospel jams')
('ARE592P1187B99F3A7', 'Tonéx', 'gospel soul')
('ARE592P1187B99F3A7', 'Tonéx', 'hip hop')
('ARE592P1187B99F3A7', 'Tonéx', 'house')
('ARE592P1187B99F3A7', 'Tonéx', 'jazz')
('ARE592P1187B99F3A7', 'Tonéx', 'latin')
('ARE592P1187B99F3A7', 'Tonéx', 'male vocalist')
('ARE592P1187B99F3A7', 'Tonéx', 'pop')
('ARE592P1187B99F3A7', 'Tonéx', 'r&b')
('ARE592P1187B99F3A7', 'Tonéx', 'religious music')
('ARE592P1187B99F3A7', 'Tonéx', 'rock')
('ARE592P1187B99F3A7', 'Tonéx', 'salsa')
('ARE592P1187B99F3A7', 'Tonéx', 'san diego')
('ARE592P1187B99F3A7', 'Tonéx', 'smooth jazz')
('ARE592P1187B99F3A7', 'Tonéx', 'soul')
('ARE592P1187B99F3A7', 'Tonéx', 'syntax records')
('ARE592P1187B99F3A7', 'Tonéx', 'techno')
('ARE592P1187B99F3A7', 'Tonéx', 'united states')
('ARE592P1187B99F3A7', 'Tonéx', 'urban')
```

2.Select all the unique tracks with the duration is strictly greater than 3020 seconds.

In [15]:

```
#We use distinct to select track_id in tacks
t = (3020,)
string = """
SELECT
    DISTINCT track_id,
    title,
    release,
    year,
    duration,
    artist_id
FROM tracks
WHERE duration > ?
"""
cursor.execute(string, t)
df = pd.DataFrame(cursor.fetchall())
df.columns = ['track_id','title','release','year','duration','artist_id']
df
```

Out[15]:

| | track_id | title | release | year | duration | artist_id |
|---|---|---|---|---|---|---|
| **0** | TRBOGZY128F4269C26 | Hauptteil | Endlich Schlank | 0 | 3020.87791 | ARRXCAY1242077F342 |
| **1** | TRDZTTO12903CF1A2E | Grounation | Carried Beyond | 0 | 3034.90567 | ARSSDRQ1241B9CB1A5 |
| **2** | TRGASQU128F92D762F | Rag: Gaud Malhar & Rag: Mian Malhar | Nidhi | 0 | 3030.17751 | ARG62WR1187FB461BC |
| **3** | TRGXALK12903D15504 | Don Carlos: Act III | Verdi: Don Carlos | 0 | 3024.97914 | ARFULUG1272BA849E4 |
| **4** | TRHWGWD12903CD132B | Germans are people too (Alive & Kickin) | Germans Are People too (Alive & Kickin´) | 0 | 3027.17342 | ARFIKPQ1272BCD1FD4 |
| **5** | TRJOADI12903CC00F9 | Monolithe II | Monolithe II | 2005 | 3024.66567 | AR8XMK11187B9AF8C7 |
| **6** | TRLOKWE12903CF205E | Hud | Le Saint Coran (avec Doae) | 0 | 3026.75546 | ARHDNFW11F4C83BECD |
| **7** | TRMTJMT128F93221B0 | Galactic Odyssey | Galactic Odyssey | 0 | 3029.08036 | ARNHB3M1187B98B512 |
| **8** | TROVFHS128F934D39D | Live Acid Wandererz | Live Acid Wandererz | 0 | 3026.57261 | ARIAXFE11F50C50923 |
| **9** | TROZPGO128F426FD26 | Kunverbainu Mameru - Aakhyaana | Kunverbainu Mameru | 0 | 3022.05342 | ARPLGTP12454A46FA1 |
| **10** | TRPIWVS128F4289D7F | Chapitre Un (a): Toutes Les Histoires | Histoire(s) du cinéma (Complete Soundtrack) | 0 | 3032.76363 | ARIV4271187B9B824F |
| **11** | TRPJBMF128F9355E4C | Members Select Special Bonus Mix (Free Bonus m... | Private Beach Club - By Afterlife | 0 | 3030.62159 | ARGDNIE1269FCD12AF |
| **12** | TRPWIUP128F426B47B | Der Geist des Llano Estacado   Ein Spion | Karl May: Unter Geiern | 0 | 3032.58077 | ARJRKGN12420781485 |
| **13** | TRQCLSM128F42944D9 | Delirium Tremens | Delirium Tremens | 0 | 3024.61342 | ARBNOH41187FB5B059 |
| **14** | TRQRHPV12903CB345A | Galactic Odyssey | Galactic Odyssey | 0 | 3030.90893 | ARKIGPF1187B98BD79 |
| **15** | TRSMLIB128F934C0A8 | Discussion 2 | Inner Voices | 0 | 3033.44281 | ARCRQDC1272BA831EB |
| **16** | TRTBHMV128F4245478 | Kamalapadamalar - Harikambhoji - Adi | Sanjay Subrahmanyan - December Season 2003 | 0 | 3022.28853 | ARBTWFL122988F01AF |
| **17** | TRTBTAV128F4246BB2 | Openin' Doors | Running 4 President 2K8 (2 Disc Set) | 0 | 3030.02077 | AREBBGV1187FB523D2 |
| **18** | TRUMEHU128F932D272 | Raga: Kaushi Kanada (Tabla: Kumar Bose) | Lingering Emotions | 0 | 3032.50240 | ARI4ARP1187FB50847 |
| **19** | TRZSLOD12903CF6FB5 | Iraqi Prisoner Abuse | George W. Bush - Taking America | 0 | 3027.72200 | ARMDCV21187B9B13AD |

3.Find the ten shortest (by duration) 10 tracks released between 2010 and 2014 (inclusive), ordered by increasing duration.

```
In [11]: string = """
         SELECT *
         FROM tracks
         WHERE year>=2010 and year<=2014
         ORDER BY duration ASC
         LIMIT 10
         """
         cursor.execute(string)
         #find ten shortest so use ORDER BY and choose ascending, also limit to first ten tracks
         df = pd.DataFrame(cursor.fetchall())
         df.columns = ['track_id','title','release','year','duration','artist_id']
         df
```

Out[11]:

| | track_id | title | release | year | duration | artist_id |
|---|---|---|---|---|---|---|
| **0** | TRUJRNE12903CCE156 | Spirit | Deep & Meaningless Remixes | 2010 | 3.70893 | ARIWIEL1187B9A2197 |
| **1** | TRLMWPC12903D0EB6D | 64:14 | Audio_Data_Bank | 2010 | 5.06730 | ARYLUL51187B9947D9 |
| **2** | TRPMUAO12903CBBEA3 | Fire With Fire | Hanging On By A Thread | 2010 | 6.66077 | ARZKRMD1241B9C9F21 |
| **3** | TRTKXQG12903D06EA3 | Certain Things (Interlude) | I m New Here | 2010 | 8.48934 | AREPYZO1187B9B9C2D |
| **4** | TRCERDU12903D03CF7 | Night of the Morbid Psycho | Psalm of the Grand Destroyer | 2010 | 10.86649 | ARB42181187B9A4656 |
| **5** | TRGVKMD12903CEB193 | Auto | Bilder Fressen Strom | 2010 | 11.46730 | ARLB90U1187B996AE5 |
| **6** | TRXWWHJ12903CAB222 | Pablo's Heart | There Is Love In You | 2010 | 11.85914 | AROKAO61187FB38105 |
| **7** | TRVJQOT12903CEB184 | Goldene Mitte | Bilder Fressen Strom | 2010 | 12.56444 | ARLB90U1187B996AE5 |
| **8** | TRADDAQ12903CBBEA4 | Invisible | Hanging On By A Thread | 2010 | 14.13179 | ARZKRMD1241B9C9F21 |
| **9** | TRJUJCN12903D06E9F | I Was Guided (Interlude) | I m New Here | 2010 | 14.39302 | AREPYZO1187B9B9C2D |

4.Find the top 20 most frequently used terms, ordered by decreasing usage.

```
In [16]: string = """
         SELECT
             term,
             count(*)
         FROM artist_term
         GROUP BY term
         ORDER BY Count(*) DESC
         LIMIT 20
         """
         cursor.execute(string)
         for r in cursor:
             print(r)
```

```
('rock', 23631)
('electronic', 20797)
('pop', 17025)
('alternative rock', 13206)
('hip hop', 11980)
('united states', 11735)
('house', 10352)
('jazz', 10100)
('indie', 9582)
('alternative', 9545)
('electro', 9488)
('experimental', 8658)
('indie rock', 8613)
('pop rock', 8420)
('punk', 8394)
('techno', 8295)
('folk', 7849)
('downtempo', 7750)
('ambient', 7130)
('soul', 7127)
```

5.Find the artist name associated with the longest track duration.

In [17]:

```
#because name only appears in TABLE artists, and duration only appears in TABLE tracks.
#We should join the two table and use artist_id(which the two table share) to get the artist
#with the longest duration.
#also we need to first select the record with the longest duration and find that artist_id.

string = """
SELECT
    artist_name
FROM artists
INNER JOIN tracks
ON artists.artist_id = tracks.artist_id
WHERE duration = (SELECT MAX(duration) FROM tracks)
"""
cursor.execute(string)
for r in cursor:
    print(r)
```

```
('Mystic Revelation of Rastafari',)
```

6.Find the mean duration of all tracks.

In [18]:

```
string = """
SELECT
    AVG(duration)
FROM tracks
"""
cursor.execute(string)
print(cursor.fetchall())
```

```
[(249.71338394213936,)]
```

7.Using only one query, count the number of tracks whose artists don't have any linked terms.

In [19]:

```
#because we can only use one query and we need to acquire the artists that are in table tracks
#but not in table artist_term, so it's useful to use outer join.
string = """
SELECT count(tracks.track_id)
FROM tracks
LEFT JOIN artist_term ON tracks.artist_id = artist_term.artist_id
WHERE artist_term.artist_id IS NULL
"""
cursor.execute(string)
print(cursor.fetchall())
```

```
[(3710,)]
```

8.Index- Run Question 1 query in a loop for 100 times and note the minimum time taken. Now create an index on the column artist_id and compare the time. Share your findings in the report.

In [20]:

```
#first, run Q1 in a loop for 100 times and note the time:
t = ('TRMMWLD128F9301BF2',)
string = """
SELECT
    artists.artist_id,
    artists.artist_name,
    artist_term.term
FROM artists
INNER JOIN tracks
ON artists.artist_id = tracks.artist_id
INNER JOIN artist_term
ON tracks.artist_id = artist_term.artist_id
WHERE tracks.track_id=?
"""
def func():
    for i in range (0, 100):
        cursor.execute(string, t)

%timeit func()
```

```
1min 58s ± 3.31 s per loop (mean ± std. dev. of 7 runs, 1 loop each)
```

- it shows the total time it takes for 100 loops is: 1min 58s ± 3.31 s per loop (mean ± std. dev. of 7 runs, 1 loop each). average time for one loop is around 1.18s.

In [21]:

```
#Then we create indices in turn for artist_id in each table.
string = """
CREATE INDEX index_artist_id
ON tracks(artist_id)
"""
cursor.execute(string)

string = """
CREATE INDEX index1
ON artists(artist_id)
"""
cursor.execute(string)

string = """
CREATE INDEX index2
ON artist_term(artist_id)
"""
cursor.execute(string)
```

Out[21]:

```
<sqlite3.Cursor at 0x111cc8c00>
```

In [22]:

```
#at last we test the time it takes to run query after adding indices:
t = ('TRMMWLD128F9301BF2',)
string = """
SELECT
    artists.artist_id,
    artists.artist_name,
    artist_term.term
FROM artists
INNER JOIN tracks
ON artists.artist_id = tracks.artist_id
INNER JOIN artist_term
ON tracks.artist_id = artist_term.artist_id
WHERE tracks.track_id=?
"""
def func():
    for i in range (0, 100):
        cursor.execute(string, t)
%timeit func()
```

```
1.86 ms ± 22.4 µs per loop (mean ± std. dev. of 7 runs, 1000 loops each)
```

- it shows the total time is substantially decreased compared to the query without indices:1.86 ms ± 22.4 µs per loop (mean ± std. dev. of 7 runs, 100 loops each)
- So in conclusion, we know that an index can be used to greatly speed up data retrieval.

9.Find all tracks associated with artists that have the tag eurovision winner and delete them from the database, then roll back this query using a transaction. Hint: you can select from the output of a select!

In [27]:

```
#Find all tracks associated with artists that have the tag eurovision winner
t = ('eurovision winner',)
string = """
SELECT *
FROM tracks
WHERE artist_id IN
(SELECT artist_id
FROM artist_term
WHERE term =?)
"""
cursor.execute(string,t)
df= pd.DataFrame(cursor.fetchall())
df.columns = ['track_id','title','release','year','duration','artist_id']
df
```

Out[27]:

| | track_id | title | release | year | duration | artist_id |
|---|---|---|---|---|---|---|
| **0** | TRMBQRR128F93036AA | Die weißen Segel | Sag mir wo wohnen die Engel | 0 | 193.09669 | ARAGY2M1187B9A6712 |
| **1** | TRGBZAK128F4252004 | So wie du denkst so wird es kommen | Sag mir wo wohnen die Engel | 0 | 225.72363 | ARAGY2M1187B9A6712 |
| **2** | TRHFARQ128F4252000 | Musica | Sag mir wo wohnen die Engel | 0 | 211.61751 | ARAGY2M1187B9A6712 |
| **3** | TRHPIRY12903CED4AE | O Mein Papa | Musical Highlights_Vol.1 | 1995 | 186.46159 | ARAGY2M1187B9A6712 |
| **4** | TRCMWIA12903CED4A9 | Ponylied | Musical Highlights_Vol.1 | 1995 | 151.17016 | ARAGY2M1187B9A6712 |
| **5** | TRCVIEW128F4260948 | O mein Papa | Als Mama noch ein Teeny war | 1995 | 181.05424 | ARAGY2M1187B9A6712 |
| **6** | TRFRUNJ12903CFF963 | Was kann schöner sein_ als deine Liebe | Wirtschaftswunder-Hits 3 | 0 | 123.61098 | ARAGY2M1187B9A6712 |
| **7** | TRFZYRK128F9325EC3 | Oh mein Papa | Gassenhauer | 2005 | 183.48363 | ARAGY2M1187B9A6712 |
| **8** | TRQLNAQ12903D045C1 | Wenn die Glocken hell erklingen | Best of Schlager | 1992 | 177.13587 | ARAGY2M1187B9A6712 |
| **9** | TRQSXFT128F92E31AC | Sucu Sucu | Andrea Kiewel präsentiert: Schlagergiganten de... | 1992 | 130.24608 | ARAGY2M1187B9A6712 |
| **10** | TRZMGAI12903CE2297 | Mykonos | Mykonos | 0 | 198.21669 | ARAGY2M1187B9A6712 |
| **11** | TRZMNRF128F426E491 | Komm bald wieder in meine Arme | Komm bald wieder in meine Arme | 0 | 208.79628 | ARAGY2M1187B9A6712 |
| **12** | TRZWEHG128EF33F71D | O mein Papa | Unvergessliche Gassenhauer | 1995 | 171.85914 | ARAGY2M1187B9A6712 |
| **13** | TRZDSXD128F4252006 | Ein sicherer Hafen | Sag mir wo wohnen die Engel | 0 | 173.19138 | ARAGY2M1187B9A6712 |
| **14** | TRIVGWV128F93036B1 | Que sera (Was kann schöner sein) | Sag mir wo wohnen die Engel | 0 | 183.40526 | ARAGY2M1187B9A6712 |
| **15** | TRARQBN128F93036A4 | Dein Herz muss glücklich sein | Sag mir wo wohnen die Engel | 0 | 208.56118 | ARAGY2M1187B9A6712 |
| **16** | TRAQTYP128F92F6AD7 | Oh Mein Papa | Die Deutschen Hits Der 50er | 2005 | 179.40853 | ARAGY2M1187B9A6712 |
| **17** | TRNABJX128F93036AC | Eine weiße Hochzeitskutsche | Sag mir wo wohnen die Engel | 0 | 205.68771 | ARAGY2M1187B9A6712 |
| **18** | TRPZOKJ128F4251FFF | Gott liebt alle seine Kinder | Sag mir wo wohnen die Engel | 0 | 232.04526 | ARAGY2M1187B9A6712 |
| **19** | TRPEBMN128F426AB7B | O_ Mein Papa | DER MANN AM KLAVIER | 0 | 186.14812 | ARAGY2M1187B9A6712 |
| **20** | TRLFPFH128F92F4EEA | Unter der roten Laterne von St. Pauli | Die Schönsten Schlager aller Zeiten 10 | 0 | 197.58975 | ARAGY2M1187B9A6712 |
| **21** | TRJDWLC128F9332B63 | O mein Papa | Deutsche Schlager Oldies der 50er Jahre - Folg... | 1995 | 187.55873 | ARAGY2M1187B9A6712 |
| **22** | TRJODBK128F9319826 | Refrain | Paris tes chansons en or volume 3 | 1999 | 192.86159 | ARAGY2M1187B9A6712 |
| **23** | TRSRRCG128F4227F59 | Domino | Wunschkonzert der Erinnerungen Vol. 2 | 1995 | 152.16281 | ARAGY2M1187B9A6712 |
| **24** | TRDGPPK128F9325ED4 | Ponylied | Gassenhauer | 1995 | 148.06159 | ARAGY2M1187B9A6712 |
| **25** | TRDYJCO12903CE94F1 | Oh mein Papa | Greatest Schlager Vol. 4 | 2005 | 171.72853 | ARAGY2M1187B9A6712 |
| **26** | TROGGOX128F93036A7 | Der Clown | Sag mir wo wohnen die Engel | 0 | 226.01098 | ARAGY2M1187B9A6712 |
| **27** | TRXZGKP128F4252002 | Jedes Lächeln ist ein Wunder | Sag mir wo wohnen die Engel | 0 | 218.95791 | ARAGY2M1187B9A6712 |
| **28** | TRXJAYL128F92C6BC7 | O mein Papa | Die goldenen 50er - Wirtschaftwunderzeit Vol. 2 | 1995 | 180.24444 | ARAGY2M1187B9A6712 |
| **29** | TRVXLTS128F428F428 | Molitva (Serbia) | Molitva - Serbia (from Eurovision Song Contest... | 2007 | 182.41261 | ARD4DOA1187FB4ED96 |
| **...** | ... | ... | ... | ... | ... | ... |
| **154** | TRAGCDM12903CC920D | Excusez-moi | Bobino 2001 | 0 | 175.54240 | ARZK74B1187FB45EB3 |
| **155** | TRABBIN12903CC9224 | Les singes | Bobino 2001 | 0 | 184.26730 | ARZK74B1187FB45EB3 |
| **156** | TRNAIFV12903CF0620 | C'est le bonheur | C'est Le Bonheur ! | 0 | 211.30404 | ARZK74B1187FB45EB3 |
| **157** | TRNDGHL12903CF1108 | Eau | Allez Allez La Vie (en public à l'Olympia) | 0 | 238.52363 | ARZK74B1187FB45EB3 |
| **158** | TRNDDQR12903CCC246 | J'aime Paris au mois de mai | Parisabelle | 2004 | 231.65342 | ARZK74B1187FB45EB3 |
| **159** | TRNORNW12903CF117A | Ce qu'on est bien mon amour | Chante Ferrat - Hourra ! | 0 | 157.88363 | ARZK74B1187FB45EB3 |
| **160** | TRPMZXP12903CF0610 | Lola de Madrid | C'est Le Bonheur ! | 0 | 228.02240 | ARZK74B1187FB45EB3 |
| **161** | TRPPTJC12903CC927A | Le paradis des musiciens | Bobino 2001 | 0 | 223.47710 | ARZK74B1187FB45EB3 |
| **162** | TRPJZXP12903CCC24C | A Paris | Parisabelle | 0 | 187.97669 | ARZK74B1187FB45EB3 |

|  | track_id | title | release | year | duration | artist_id |
|---|---|---|---|---|---|---|
| **163** | TRTYGDH12903CF1116 | Un jour un jour | Allez Allez La Vie (en public à l'Olympia) | 0 | 267.59791 | ARZK74B1187FB45EB3 |
| **164** | TRUUGIY12903CCC245 | La Seine | Parisabelle | 0 | 208.14322 | ARZK74B1187FB45EB3 |
| **165** | TRUUHPR12903CC9254 | Je n'ai pas peur du temps qui passe | Bobino 2001 | 0 | 165.98159 | ARZK74B1187FB45EB3 |
| **166** | TRLRAVQ128F93042FC | Les paumés du petit matin | Isabelle Aubret Chante Brel | 0 | 235.54567 | ARZK74B1187FB45EB3 |
| **167** | TRLINAM128F9304308 | La Fanette | Isabelle Aubret Chante Brel | 0 | 313.46893 | ARZK74B1187FB45EB3 |
| **168** | TREAFPC12903CCC248 | Moulin Rouge | Parisabelle | 2004 | 175.25506 | ARZK74B1187FB45EB3 |
| **169** | TRENBRN12903CC926B | Tout le monde y pense | Bobino 2001 | 1990 | 277.99465 | ARZK74B1187FB45EB3 |
| **170** | TREUWPN12903CF0615 | A ma mère enfouie | C'est Le Bonheur ! | 0 | 266.65751 | ARZK74B1187FB45EB3 |
| **171** | TRJQILH12903CF111D | Des Cornouailles à l'Oural | Allez Allez La Vie (en public à l'Olympia) | 0 | 214.36036 | ARZK74B1187FB45EB3 |
| **172** | TRSMVXO12903CC921C | Le plat pays | Bobino 2001 | 0 | 217.05098 | ARZK74B1187FB45EB3 |
| **173** | TRSCTOX12903CCC23B | Ce jour-là à Paris | Parisabelle | 0 | 240.09098 | ARZK74B1187FB45EB3 |
| **174** | TRSTQFO12903CF11A3 | L'hôtel des Africains | Le Paradis Des Musiciens | 0 | 401.78893 | ARZK74B1187FB45EB3 |
| **175** | TRSUBAH12903CC923C | Boulevard Aragon | Bobino 2001 | 0 | 259.42159 | ARZK74B1187FB45EB3 |
| **176** | TRVFXGA12903CDBBAD | Aimer à perdre la raison | Age tendre& La tournée des idoles_ Vol. 5 | 2004 | 165.79873 | ARZK74B1187FB45EB3 |
| **177** | TRDCVVW12903CF060A | Province | C'est Le Bonheur ! | 0 | 278.54322 | ARZK74B1187FB45EB3 |
| **178** | TRDCOUX128F93042F2 | Bruxelles | Isabelle Aubret Chante Brel | 0 | 171.83302 | ARZK74B1187FB45EB3 |
| **179** | TROGYFN12903CF1F0A | Un jour un jour | Aragon | 0 | 262.37342 | ARZK74B1187FB45EB3 |
| **180** | TROARTF12903CF1179 | Berceuse | Chante Ferrat - Hourra ! | 0 | 203.23220 | ARZK74B1187FB45EB3 |
| **181** | TRXXKUC128F93042F4 | Voir | Isabelle Aubret Chante Brel | 0 | 120.65914 | ARZK74B1187FB45EB3 |
| **182** | TRKRQWM12903CCC243 | La complainte de la butte | Parisabelle | 0 | 180.08771 | ARZK74B1187FB45EB3 |
| **183** | TRYHYLB12903CF060C | Indio | C'est Le Bonheur ! | 0 | 224.49587 | ARZK74B1187FB45EB3 |

184 rows × 6 columns

```
In [28]: #Delete them from the database, then roll back this query using a transaction
         cursor.execute('BEGIN TRANSACTION;')
         cursor.execute('SAVEPOINT sp0; ')
         cursor.execute(
         'DELETE FROM tracks WHERE artist_id in (SELECT artist_id FROM artist_term WHERE term=?); ',t)
         cursor.execute('ROLLBACK TO sp0; ')
         cursor.execute('END TRANSACTION; ')

Out[28]: <sqlite3.Cursor at 0x111cc8c00>

In [ ]:
```