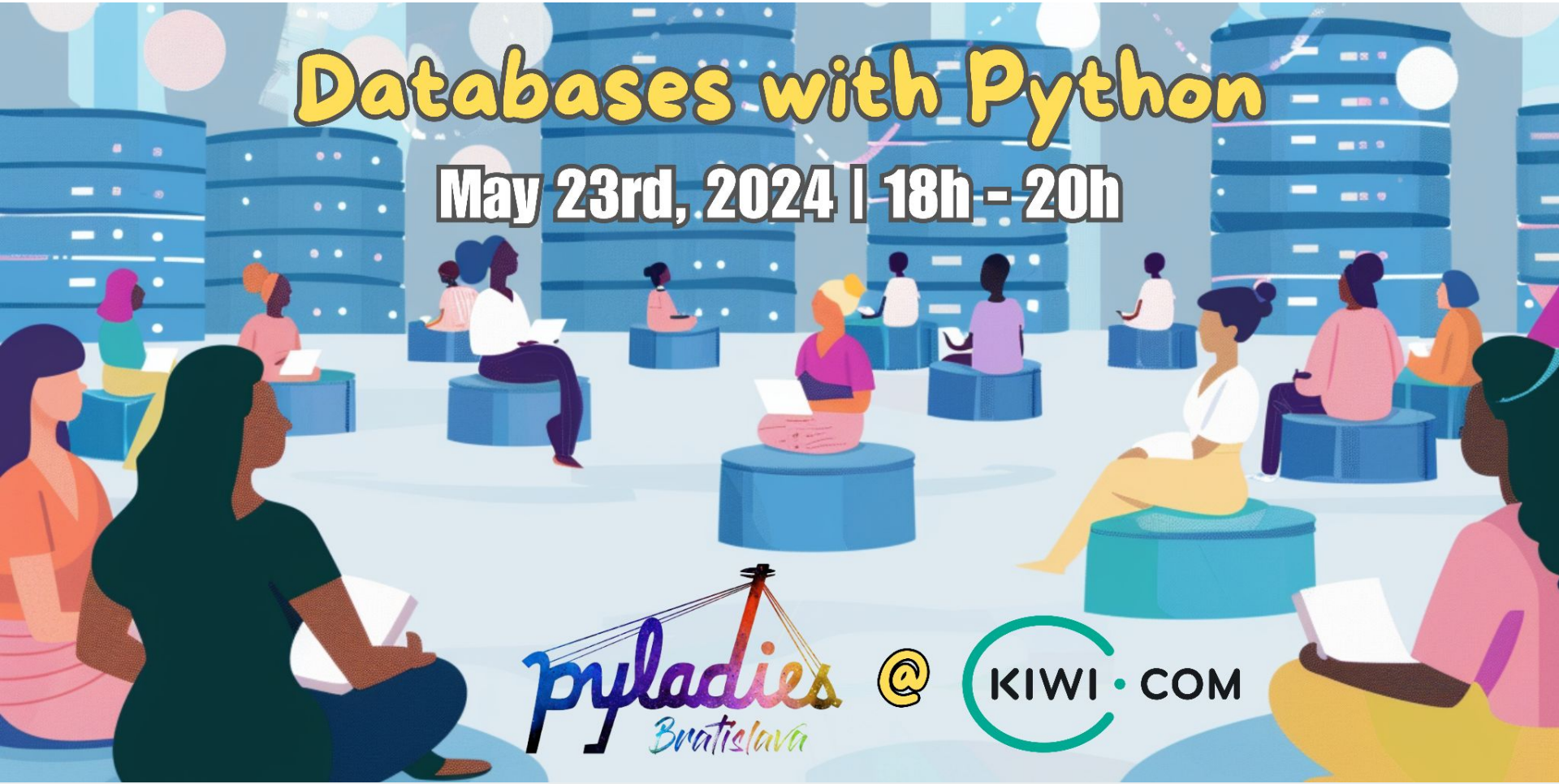

Databases with Python
May 23rd, 2024 | 18h - 20h
pyladies
Bratislava
@
KIWI · COM

About Pyladies Bratislava

1. Non-informal group
2. Respectful and non-judgemental
3. Learn and share Python stuff
4. Feel free to interrupt anytime with your questions, doubts, comments, whatever

Databases with Python

How to interact with a database

What is a database?

A database is a digital system for storing and managing organized data.

Types of databases

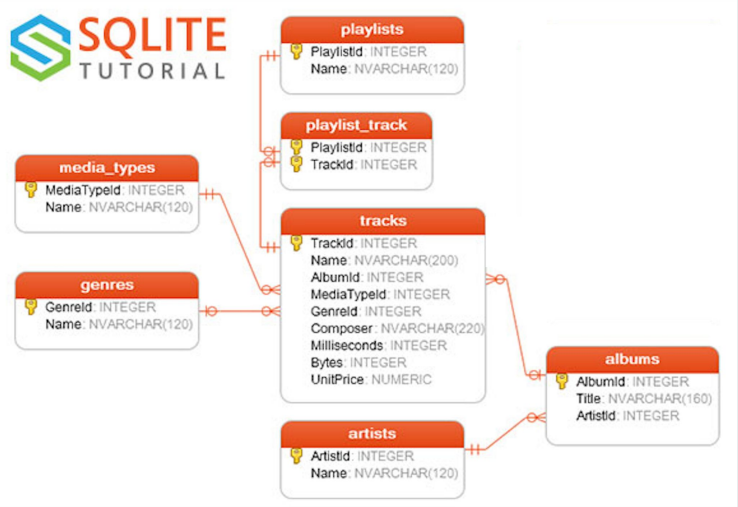
1. **Relational**: MySQL, PostgreSQL, Oracle, Microsoft SQL Server, SQLite
2. **Non-Relational (NoSQL)**:
    a. *Document:* MongoDB, CouchDB
    b. *Key-Value:* Redis, DynamoDB
    c. *Column-Family:* Apache Cassandra, HBase
    d. *Graph:* Neo4j, Amazon Neptune
3. **Specialized:** Redis, Memcached, InfluxDB, TimescaleDB
4. **Other**: Google Spanner, CockroachDB, VoltDB, ObjectDB, db4o

Questions

1. Why do we need databases?
2. What are relational databases?
3. What are NoSQL databases?

Relational databases

- Store data in tables with rows and columns. Data is accessed using SQL
- Tables
  - Columns
  - Rows
  - Keys
    - Primary keys
    - Foreign keys



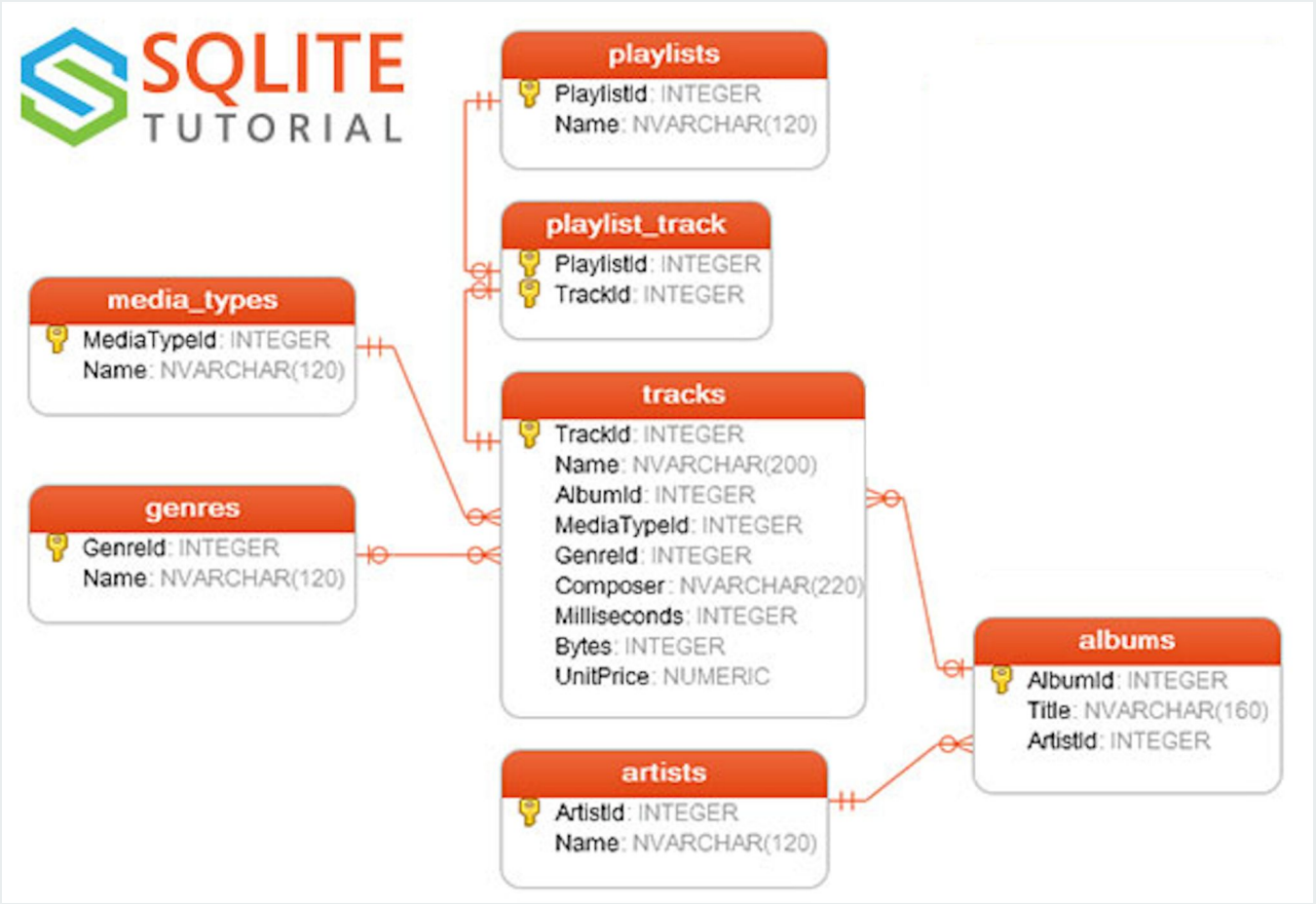
SQL - Talk to a relational DB

SQL Keywords:

- SELECT
- FROM
- WHERE
- AND
- OR
- ORDER BY
- COUNT

Sqlite3

- Python built-in:
  - `import sqlite3`
  - https://docs.python.org/3/library/sqlite3.html
- Download this sample DB:
  - https://github.com/pyladies-bratislava/databases/blob/main/music.db
- Connect to the DB and write some SQL queries


SQLITE
TUTORIAL
playlists
PlaylistId: INTEGER
Name: NVARCHAR(120)
playlist_track
PlaylistId: INTEGER
TrackId: INTEGER
media_types
MediaTypeId: INTEGER
Name: NVARCHAR(120)
tracks
TrackId: INTEGER
Name: NVARCHAR(200)
AlbumId: INTEGER
MediaTypeId: INTEGER
GenreId: INTEGER
Composer: NVARCHAR(220)
Milliseconds: INTEGER
Bytes: INTEGER
UnitPrice: NUMERIC
genres
GenreId: INTEGER
Name: NVARCHAR(120)
albums
AlbumId: INTEGER
Title: NVARCHAR(160)
ArtistId: INTEGER
artists
ArtistId: INTEGER
Name: NVARCHAR(120)

Sqlite

```
import sqlite3

sql = "SELECT COUNT(*) FROM artists;"

# Connect to the database
connection = sqlite3.connect("music.db")

cursor = connection.cursor()
cursor.execute(sql)
result = cursor.fetchone()
print(result)
cursor.close()

# Close the connection to the database
connection.close()
```

An sqlite database is a **file**.

A `connection` is a way to **interact** with that **file**.

A `cursor` allows us to retrieve and manipulate data **row** by **row**.

Exercises

1. Write a Python script that returns:
    a. How many artists there are.
    b. How many tracks there are.
    c. The names of all media types.
    d. The names of all genres.
    e. All the albums from “U2”
    f. All the tracks from the “Rattle and Hum” album from “U2”
    g. All the artists alphabetically ordered

Questions

1. Why do I need SQL?
2.

Next steps

- sqlalchemy
- ORMs

Takeaways

What do you take with you?

What do you want start doing?

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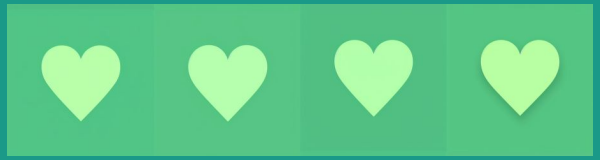
Thank you!