

Databases & SQL for Data Science with Python

PROFESSIONAL CERTIFICATE IBM Data Analyst

In this week!

Popular SQL APIs

Connecting Python apps to
a database

How to access databases
using Python

Analyze and visualize data
in Jupyter Notebooks

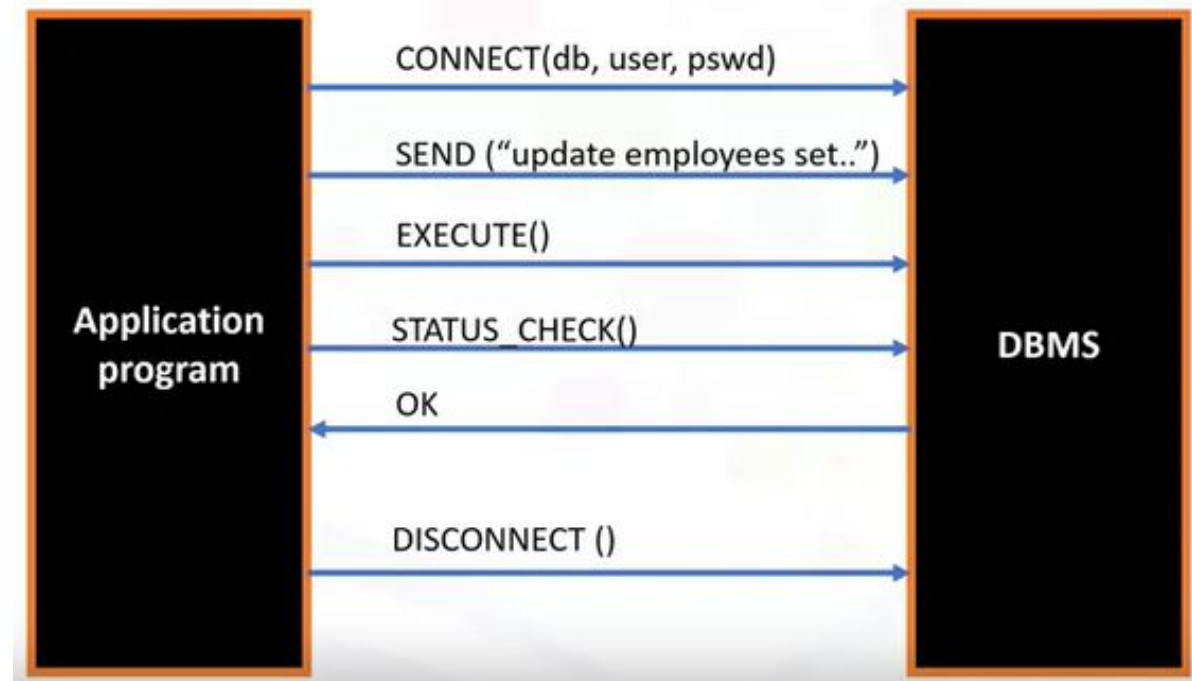
Popular SQL APIs

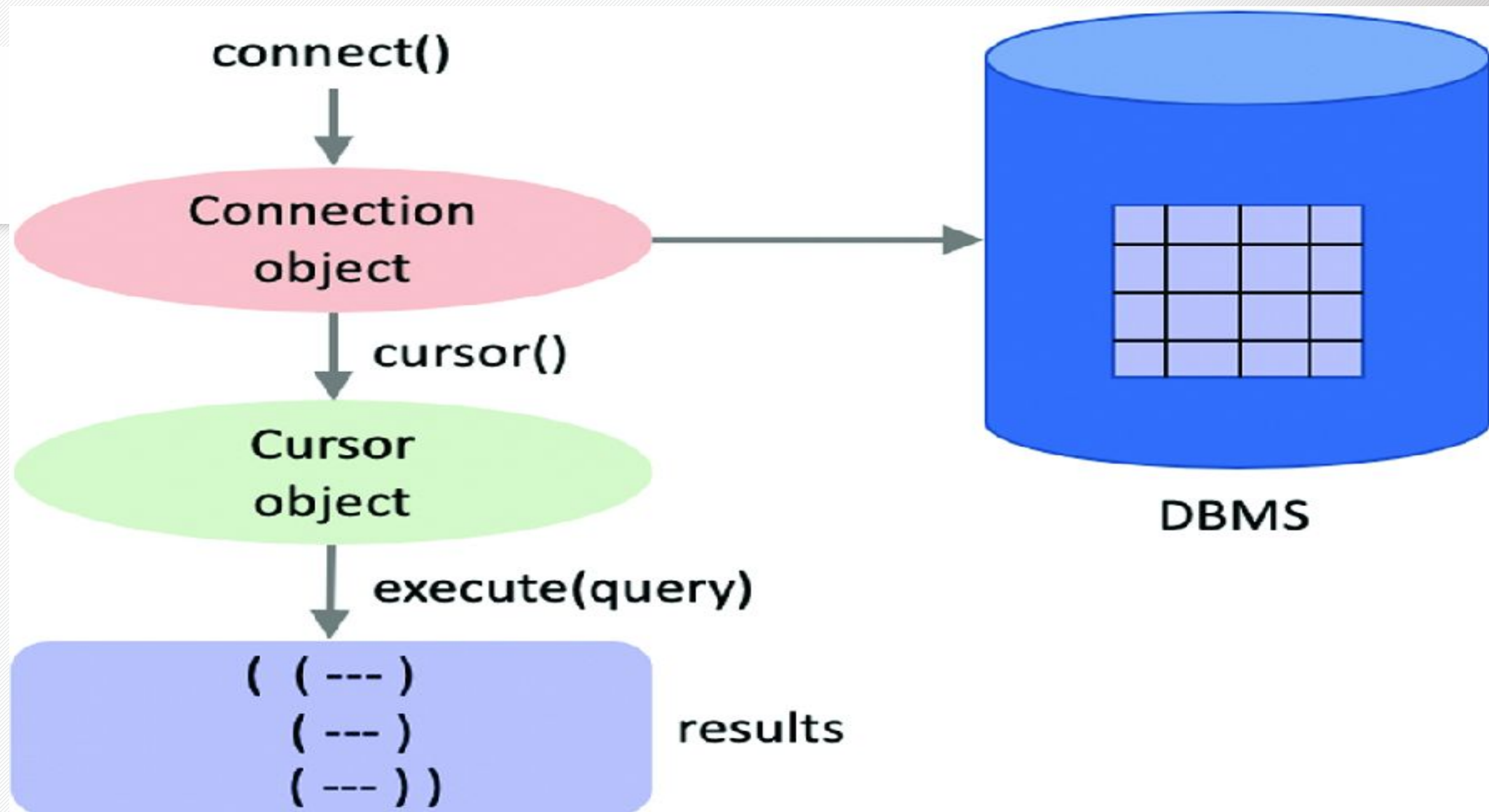
- The application program begins its database access with one or more API calls that connect the program to the DBMS.

| Application or Database | SQL API |
|--|-------------|
| MySQL | MySQL C API |
| PostgreSQL | psycopg2 |
| IBM DB2 | ibm_db |
| SQL Server | dblib API |
| Database access for Microsoft Windows OS | ODBC |
| Oracle | OCI |
| Java | JDBC |

SQL APIs library function

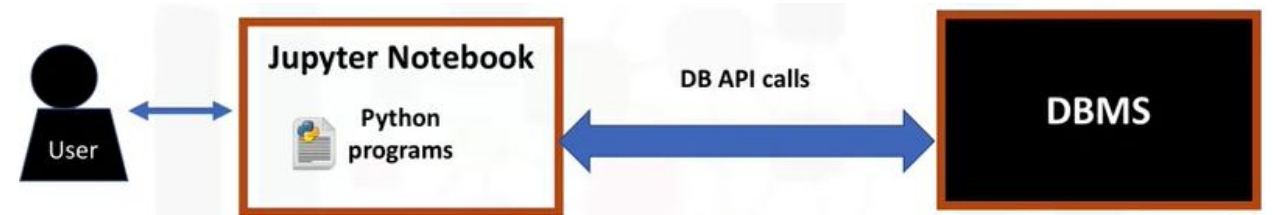
- The SQL API consists of library function calls as an application programming interface, API, for the DBMS.
- How to pass SQL statements to the DBMS?





How to access databases using Python

- What is Jupyter Notebook?
- What is RDMS?
- The Python code connects to the database using DB-API calls.
- What is DB-API?
- What are the benefits of using DB-API?



Connecting to a Database Using ibm_db API

- Describe the ibm-db API
- List the credentials required to connect to a database
- How to connect to an IBM DB2 database using Python code written on a Jupyter notebook?

Hands-on Labs

Take 50 minutes to complete Hands-on Labs on Coursera:

1. Create Database Credentials on Coursera
2. Connecting to a database instance

SQL Magic

What is SQL Magic?

Two types of magic commands:

- Cell magics: start with a double %% sign and apply to the entire cell
- Line magics: start with a single % (percent) sign and apply to a particular line in a cell

SQL Magic Limitations

- Unlike DB-API, there are no explicit methods to close a connection and free up resources.

Example

You want to execute a query to select some data from a table and fetch its results, what can you write on Jupyter notebook cell?

- `%sql select * from tablename`

Hands-on Lab

- Take 30 minutes to complete the hands-on Lab on Coursera:
Accessing Databases with SQL magic

Discuss loading data into a table steps



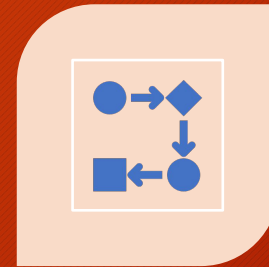
SOURCE



TARGET



DEFINE



FINALIZE

Connection methods

- The DB_API connect constructor
- cursor() method
- commit() method
- rollback() method
- close() method

Connection methods

- The DB_API connect constructor creates a connection to the database and returns a Connection Object, which is then used by the various connection methods.
- cursor() method, which returns a new cursor object using the connection.
- commit() method, which is used to commit any pending transaction to the database.
- rollback() method, which causes the database to roll-back to the start of any pending transaction.
- close() method, which is used to close a database connection.

Breakout Room Activity

How can we use Pandas to retrieve data from the database tables?

```
Df= pandas.read_sql('select * from TableName',pconn)
```

- List some panda's statistical and mathematical methods
- Be prepared to discuss your findings

Hands-on Lab

- Take 45 minutes to complete the hands-on Lab on Coursera:
Analyzing a real World Data Set

Any questions