

Introduction to SQL with Python

Using databases is a fundamental part of a data scientist's role. This training course introduces SQL databases and the SQL command syntax, and shows how Python can be used to retrieve and manipulate data held in a relational database. The course also discusses how SQLAlchemy can be used to define and interact with databases using object-oriented Python code. We use a [PostgreSQL](#) database as an example, and communicate with this using a [psycopg2](#) connection.



Course Outline

- **Introduction to databases:** An introduction to relational databases that implement the SQL standard.
- **Data entry and retrieval:** Using Python as a means to query and modify data in a SQL database.
- **Standard SQL commands:** Typical SQL commands when working with a database.
- **Pandas:** Using Pandas to load database contents into DataFrame objects and vice versa.
- **Multiple tables:** Dealing with and joining data that resides in multiple tables within a database.
- **Object-oriented programming:** Using SQLAlchemy to define and interact with databases using object-oriented code.

Learning Outcomes

Session 1:

By the end of session 1 participants will...

- understand the concepts of relational database management.
- be introduced to the PostgreSQL dialect.
- understand how to form a connection using psycopg2.
- have learned how to run basic SQL commands:
 - extracting data with **SELECT** statements
 - filtering and organising data
 - creating tables and inserting data
- be able to use parameterised queries to insert Python data.

Session 2:

By the end of session 2 participants will...

- be able to convert between SQL data and Pandas DataFrame formats.
- have learned how to join tables by matching variables.
- understand object-oriented database management with SQLAlchemy:
 - defining database tables using Python classes
 - inserting rows using class instances

- constructing queries by chaining methods

This course does not include:

- A thorough introduction to Pandas, see our [Intro to Python](#) course for this.
- Database services by cloud providers like AWS and Azure, see our [Intro to SQL](#) course for an introduction.
- Connecting to databases through other programming languages like R, see our [Intro to SQL with R](#) course for this.

Attendee Feedback

- “Myles as an instructor is knowledgeable with good demo and time management.”