[[Ch04 – CockroachDB SQL]]

# CockroachDB SQL

The language of CockroachDB is SQL. While there are some command line utilities, all interaction between an application and the database are mediated by SQL language commands.

SQL is a rich language with a long history – we touched upon some of that history in Chapter 1. A full definition of all SQL language features would require a book in its own right, and would be almost instantly out of date, since the SQL language evolves with each release. Therefore, this chapter aims to provide you with a broad overview of the SQL language used in CockroachDB without attempting to be a complete reference.

A complete reference for the CockroachDB SQL language can be found in the [CockroachDB documentation set](https://www.cockroachlabs.com/docs/stable/index.html) . A broader review of the SQL language can be found in the OReilly book “SQL in a Nutshell”. book “SQL in a Nutshell”.

We’ll pay special attention in this chapter to language features which are unique to CockroachDB, though be aware that language idioms that are specific to advanced features may be covered in more detail within later chapters

## SQL Language compatibility

CockroachDB is broadly compatible with the PostgreSQL implementation of the SQL:2003 standard. The SQL:2003 standard contains a number of independent modules and no major database implements all of the standard.

CockroachDB varies from PostgreSQL primarility in the following areas….

* No support for stored procedures, triggers or events
* No support for UDFs
* XML functions
* FULLTExt functions and indexes

CockroachDB introduces some unique SQL language constructs to support the following features:

## Review of SQL

This chapter cannot serve as a complete reference to the SQL language. However, let’s quickly review some of the core “CRUD” operations in SQL

* Create table
* Insert data
* Update Data
* Delete data
* Simple Select
* Joins
* Aggregation

## Data types

Here we review the datatypes supported by CockroachDB, particularly those which are unique to CockroachDB or PostgreSQL.

* NULLs
* Scalars
* Autoincrement
* JSONB
* ARRAY
* Special
* Type annotations in CockroachDB

## Functions

Review of functions by category

* Array Functions
* Date functions
* JSONB functions
* STRING functions
* Spatial functions
* System functions
* Aggregation Functions
* Windowing Functions

## Operators

* Bitwise
* Mathematical
* Logical

## The SELECT statement

* Subqueries
* Table expressions
* FOR UPDATE

### AS OF SYSTEM TIME

## Data Definition language

We commence with a review of the types of object supported by the CockroachDB CREATE statement:

* Databases
* Schemas
* Tables
  + Temporary tables
  + LIKE
* Column Families
* Indexes
  + STORING/COVERING clause
* views
* Columns
* Sequences
* partitions
* ENUMS
* Constraints
* Types
* Roles
* Shedules
* Changefeeds

### CREATE TABLE

### CREATE INDEX

## Data Manipulation language

* Insert
* Update
* Upsert
* Delete
* Export/Import
* Truncate
* Transactional control

## Access management

* Roles, users, privileges

## System commands

* Session management
* Cluster management
* Query managament
* statistics
* Explain
* Job management
* Backup and restore
* Changefeeds