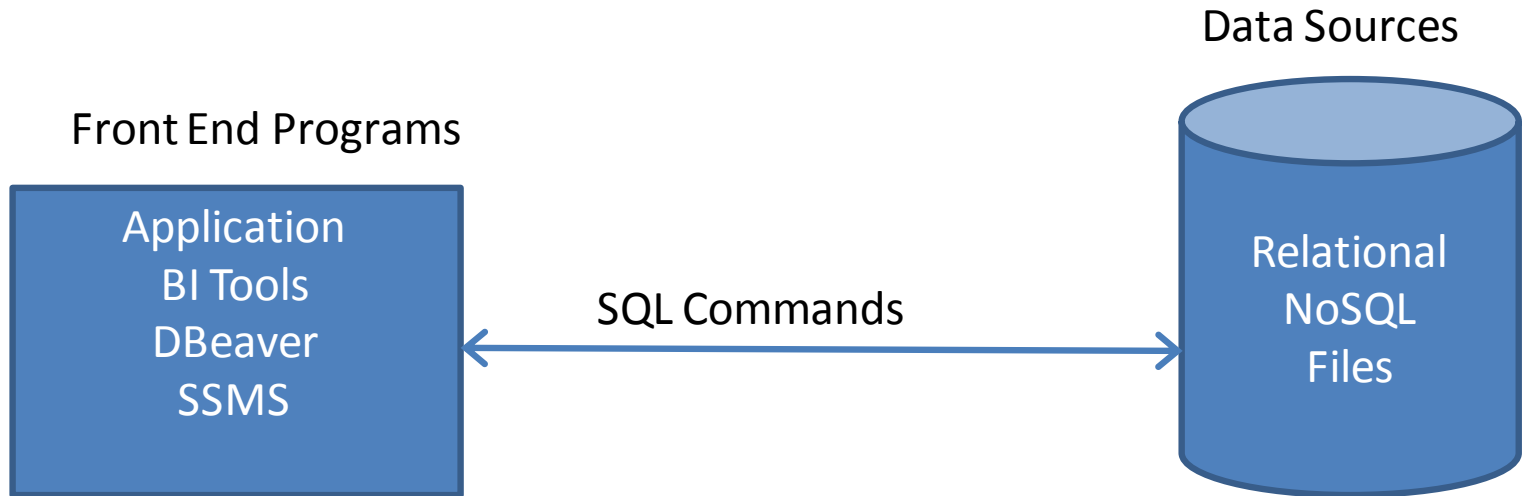# SQL

- Invented and deployed to support Relational Database Management Systems

- Becoming common interface for NoSQL databases

- De facto universal data language

Role of SQL

Data Sources

Front End Programs

Application
BI Tools
DBeaver
SSMS

SQL Commands

Relational
NoSQL
Files

- SQL commands are sent from front-end programs to back-end server
- Back end server:
  - Parses command to determine action to be taken
  - Completes the action
  - Returns results

SQL Commands

- Not all Databases Management Systems adhere 100% to SQL standards

- All Database Management Systems have their own proprietary enhancements to SQL standards

- TSQL: Transact SQL

  Standard SQL + SQL Server Enhancements

SQL Command Categories

DML	DDL	DCL
SELECT	CREATE TABLE	GRANT
INSERT	ALTER TABLE	REVOKE
UPDATE	DROP TABLE	DENY
DELETE	CREATE VIEW	
	ALTER VIEW	
	DROP VIEW	

- DML: Data Manipulation Language
  - Selects and alters data
- DDL: Data Definition Language
  - Creates, alters, and drops database objects
- DCL: Data Control Language
  - Controls users' permissions

SELECT (Transact-SQL)

[WITH <common_table_expression>]

SELECT select_list [INTO new_table]

[FROM table_source]

[WHERE search_condition]

[GROUP BY group_by_expression]

[HAVING search_condition]

[ORDER BY order_expression [ASC | DESC]]

WHERE Clause

- Optional
- After the FROM clause in a SELECT command
- Filters rows
- All rows will be returned when not present

SQL Comparison Operators

Operator	Meaning
= (Equals)	Equal to
> (Greater Than)	Greater than
< (Less Than)	Less than
>= (Greater Than or Equal To)	Greater than or equal to
<= (Less Than or Equal To)	Less than or equal to
<> (Not Equal To)	Not equal to
!= (Not Equal To)	Not equal to (not ISO standard)
!< (Not Less Than)	Not less than (not ISO standard)
!> (Not Greater Than)	Not greater than (not ISO standard)

SQL Logical Operators

Operator	Meaning
ALL	TRUE if all of a set of comparisons are TRUE.
AND	TRUE if both Boolean expressions are TRUE.
ANY	TRUE if any one of a set of comparisons are TRUE.
BETWEEN	TRUE if the operand is within a range.
EXISTS	TRUE if a subquery contains any rows.
IN	TRUE if the operand is equal to one of a list of expressions.
LIKE	TRUE if the operand matches a pattern.
NOT	Reverses the value of any other Boolean operator.
OR	TRUE if either Boolean expression is TRUE.
SOME	TRUE if some of a set of comparisons are TRUE.