

## SQL: Structured Query Language

### SQL Terminology

- SQL helps efficiently <sup>(3)</sup>
  - query data
  - update data
  - manipulate data
- Python works with SQL to connect databases together <sup>(2)</sup>
  - connect databases together
  - execute SQL queries
- SQL is a language used for relational databases
- SQL is used for querying data

### Data Terminology

- data is a collection of facts (words, numbers) and/or pictures
- data is a critical asset for business
- data needs to be secured, stored, and accessed quickly <sup>(3)</sup>
  - secured
  - stored
  - access quickly


### Database Terminology

- database is a repository of data <sup>(2)</sup>
  - a repository of data
  - a program that stores data
- database provides functionality for adding, modifying, and querying <sup>(3)</sup> data.
- relational database is data stored in tabular form — columns and rows
- columns contain properties of an item
- An example of a property of an item could be last name, first name <sup>(2)</sup>
  - last name
  - first name
- table is a collection of related things
- T/F Relations between tables can exist. True
- DBMS (Database Management System) is software used to manage databases
- Other words that can be used interchangeably for database are database server, database system, data server, DBMS <sup>(4)</sup>
  - database server
  - database system
  - data server
  - DBMS

## RDBMS (Relational DBMS) Terminology

- RDBMS is a set of software tools that controls the data
- Data in RDBMS can be controlled by actions like accessibility, organization, storage
  - accessibility
  - organization
  - storage
- Examples of RDBMS MySQL, Oracle Database, IBM Db2 <sup>(3)</sup>
  - MySQL
  - Oracle Database
  - IBM Db2
- Basic SQL Commands are Create a table, Insert, Select, Update, Delete <sup>(5)</sup>
  - Create a table
  - Insert
  - Select
  - Update
  - Delete

### SELECT statement

- A SELECT statement is a Data Manipulation Language (DML)
- A DML will read data, modify data <sup>(2)</sup>
  - read data
  - modify data
- The syntax for SELECT is Select \* from tablename;
- The diagram between tablename and properties of an item (column) is 
- The syntax for selecting specific properties from a table is select column-a, column-b, ... column-n from tablename;
- T/F The order of your columns displayed will always match the order in the SELECT statement. True

### WHERE clause

- The WHERE clause can restrict the result set
- T/F The WHERE clause always requires a predicate. True
- T/F The predicate always evaluates to True, False, or Unknown. True
- The syntax for using WHERE clause is select column-a, column-b, ..., column-n from tablename; where predicate

select book\_id, title from Book where book\_id = 'B1';

- An example of using the WHERE clause is select book\_id, title from Book where book\_id = 'B1';

- The 6 comparison operators are =, >, <, <>, >=, <=
  - =
  - >
  - <
  - <> (not equal to)
  - >=
  - <=

- The predicate is also known as condition

## COUNT

- Count is a built-in database function
- Count retrieves the number of rows
- The syntax for querying the total rows of a given table is select COUNT(\*) from tablename;
- The syntax for querying the total rows of a given column equaling x is select COUNT(column-name) from tablename where column-name = 'x';
- The syntax for retrieving unique values in a column is select DISTINCT column-name from tablename;
- The output of this syntax: a list of unique countries that received gold medals.

### Limit

- Limit restricts the number of rows retrieved from the database
- The syntax: select \* from tablename LIMIT 10; will result in the first 10 rows in a table
- The syntax: select \* from MEDALS where YEAR = 2018 LIMIT 5; will result in five rows or less of the year 2018

### Insert Statement

- The INSERT statement is used to add new rows to a table.
- T/F The INSERT statement is DML statement. True
- The syntax of the INSERT statement is INSERT INTO tablename (column-a, column-b, ..., column-n) VALUES (value-r11, value-r12, ..., value-r1n), (value-rm1, value-rm2, ..., value-rmn);

## Update Statement

① T/F UPDATE statement is a DML Statement.  
True

② UPDATE statement is used to \_\_\_\_\_  
alter or modify the data

③ The syntax for UPDATE Statement is \_\_\_\_\_  
`UPDATE tablename SET column_a = 'new-a', column_b = 'new-b',  
... column_n = 'new-n' where predicate;`  
Optional for specificity

④ The syntax to change first name and last name to  
Lakshmi Katta where AUTHOR-ID = A2 is \_\_\_\_\_  
`UPDATE AUTHOR SET LASTNAME = 'KATTA', FIRSTNAME = 'LAKSHMI'  
where AUTHOR-ID = 'A2';`

## DELETE Statement

① T/F DELETE Statement is DML Statement.  
True

② The syntax for DELETE statement by  
a column\_name is \_\_\_\_\_

`DELETE FROM tablename  
where column_name in ('property-a', 'property-b', ...  
'property-n');`

③ The result of the code  
`DELETE FROM AUTHOR where AUTHOR-ID in ('A2', 'A3');`  
is \_\_\_\_\_.  
Deletes a row where AUTHOR-ID is either 'A2' or 'A3'.

④ T/F If you do not specify a where clause, all the  
rows will be deleted.  
True

⑤ T/F You do not use DELETE to delete columns.  
True

⑥ The general syntax for deleting columns is \_\_\_\_\_  
`ALTER TABLE tablename DROP COLUMN column_name;`

⑦ T/F MySQL, PostgreSQL have the same syntax for dropping multiple  
columns but SQL Server and Oracle database each have  
their own syntaxes.  
True.