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INSTRUCTIONS

This worksheet is part of an assessed practical. You must complete the worksheet and make notes of your answers to each section, then **complete the Blackboard quiz to get the marks**. You will be asked questions which relate specifically to the work done in the worksheets, as well as some general questions on the topic.

Please also submit a single, annotated SQL file (.sql) with all your practical solutions via the Blackboard Worksheet Submission link. This required, non-assessed step helps you prepare for the weekly quiz.

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Introduction

Connecting to a database For this practical, you will need to connect to a *PostgreSQL* database, instructions on how to connect to your personal *PostgreSQL* database provided by the department can be found on *BlackBoard* under *Practical Worksheets and Resources*. Alternatively, you could install *PostgreSQL* locally on your own machine (see `https://www.postgresqltutorial.com/install-postgresql/`) or use *PostgreSQL* on an online service such as `https://sqliteonline.com/`. But the departmental *PostgreSQL* service is the only one officially supported by us.

Online resources You are strongly encouraged to complete the online training at `https://www.codecademy.com/en/courses/learn-sql/` before attempting this practical. Documentation and further tutorials are available at `https://www.w3schools.com/sql/` and *PostgreSQL* specific documentation is available at `https://www.postgresql.org/docs/`.

Questions

This worksheet asks you to perform some basic database operations using SQL related to the following table about the top 10 IT and tech companies in the world (in terms of revenue in 2023 – Forbes):

id	name	headquarters	established_year	ceo
1	Apple	California, US	1976	Tim Cook
2	Amazon	Washington, US	1994	Andy Jassy
3	Alphabet	California, US	2015	Sundar Pichai
4	Microsoft	Washington, US	1975	Satya Nadella
5	Tencent	Shenzhen, China	1998	Ma Huateng
6	Meta	California, US	2004	Mark Zuckerberg
7	TSMC	Hsinchu, Taiwan	1987	C.C. Wei
8	Nvidia	California, US	1993	Jensen Huang
9	Salesforce	California, US	1999	Marc Benioff
10	IBM	New York, US	1911	Arvind Krishna

1. Add a command to delete ("drop") the table called *company* if it exists. This will help if you want to run your solution .sql file while testing/debugging repeatedly.

2. Create the table's structure (i.e. the columns) using the CREATE TABLE command.
   i) Name the table *company*.
   ii) The year and id should be integers and the remaining attributes are strings.
   iii) Ensure that the name column is unique and cannot be empty.
   iv) Identify and specify the PRIMARY KEY for the table.

3. Populate the rows of the company table, as illustrated in the table above, using the INSERT INTO command.

4. Write a query to display the full record of all companies, ordered from the most recently established to the oldest. After running the query, identify the name of the newest company in the list.

5. Use the ALTER TABLE command to add a column to the table called "industry" of type VARCHAR(20) and default value 'Tech'.

6. UPDATE the table to set the "industry" value to 'Consumer electronics' for the company Apple.

7. Write a SQL SELECT statement to retrieve the CEO and established_year columns from the company table, for all companies whose names begin with the letter 'M'. The results should be displayed in order of established_year, from the most recent to the oldest.

8. Write a SELECT command to get the company name, CEO and year columns from the database, for the tech companies that are located in the US, ordered by increasing year (Hint: Use LIKE in the WHERE clause).

9. Write a query to find which US locations serve as the headquarters for more than one of these top companies. The report should show the headquarters location and the number of companies based there.