

# SQL Worksheet

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## Introduction

Structural Query Language (SQL) is a querying language for database management systems. It is typically used in Database Management and querying information off from a Database.

In this worksheet, we are going to go over several important features in SQL with [this](#) database.

## Basics

Each database is separated into tables. Each table consists of different information as opposed to other tables. For example in the SQL Database, the table Customers stores the Customers and nowhere else stores information about the customers.

Each of the tables consists of rows (records / entries), and columns (attributes). We can view the whole table using the following SQL command, where somewhere is any arbitrary table.

---

```
SELECT *  
FROM somewhere
```

---

The '\*' inside the command means 'to get everything'. You may change the '\*' to any attribute name.

## Exercise

- Example: Show all the suppliers and their corresponding country:

---

```
SELECT SupplierName, Country  
FROM Suppliers
```

---

- Show all customers and their country only.
- Show all orders and their corresponding order date.
- Show all Employees and their Birth Date

## where

It might not be very helpful to view the whole table every time. Therefore we can use the keyword 'where' to select specific features. Note that every column has a specific datatype (which was clearly defined), and some operations cannot be applied to specific datatype (such as the operation  $>$  on strings). You may think of the condition similarly as Python.

You may use select from normally and add in a where afterwards, such as:

---

```
SELECT *  
FROM somewhere  
WHERE some_condition
```

---

You may apply binary operations, such as and, or, not to the condition as well.

## Exercise

- Example: Show all the suppliers who are from the UK:

---

```
SELECT SupplierName  
FROM Suppliers  
WHERE Country = 'UK'
```

---

- Show all customers with their address who are from Mexico.
- Show all orders which are made before 1996-12-01.
- Show all orders Employee ID 5 made.

You may also decide to order the table by a specific column on a specific order, i.e. ascending (asc) or descending (desc). Using my example above, if I would like to order it by the supplier name, I can amend my query to be:

---

```
SELECT SupplierName  
FROM Suppliers  
WHERE Country = 'UK' ORDER BY Supplier asc
```

---

## Queries with Multiple Tables

In every table (at least for the standardised ones), there should be an attribute that uniquely identifies a record. This is called the ID, or the Primary Key. For example your UCL Student ID is your unique ID that identifies you uniquely inside the school's system.

When you would like to join query several tables, i.e. there are items in table A that is linked with table B and I would like to view both of them, you

can make a query that selects two, or more tables in the 'from' clause and you have to specify which attribute should be equal to each other when you specific such.

You must also remember that you have to use table.attribute to access a specific attribute in a specific table, as there may be name clashes in different tables.

## Exercise

- Example: Show all Customer Names and their Address who made an order with Employee 3 before 1996-08-01.

---

```
select Customers.CustomerName, Customers.Address,  
       Orders.OrderDate  
from Customers, Orders  
where Customers.CustomerID = Orders.CustomerID and  
       Orders.EmployeeID = 3 and OrderDate < '1996-08-01'
```

---

- Show all customers who ordered more than 20 items of the same product.
- Show all orders made by Employee 'Nancy Davolio'.
- Show all orders shipped by 'Speedy Express'.
- Show all products from supplier 'Mayumi's'.
- Show all orders which is from SupplierID 2.
- Show all orders which is from Supplier 'Exotic Liquid'.
- Show all products with Category as 'Beverages'.

## Difficult Exercise (Involving More than 2 Tables)

- Show all Customers who ordered more than 10 products from Supplier 'Tokyo Traders'
- There is a defect with every beverage made by 'Exotic Liquid' after '1997-01-01'. Find all Customers and their corresponding Employee with their Address.