Data base SQL

1.what is database?

Ans. A database is a collection of [information](http://searchsqlserver.techtarget.com/definition/information) or data that is organized so that it can be easily accessed, managed and updated.

Data is organized into rows, columns and tables, and it is indexed to make it easier to find relevant information. Data gets updated, expanded and deleted as new information is added. Databases process workloads to create and update themselves, querying the data they contain and running applications against it.

2. what is table, column and row?

Ans. Table: The data in RDBMS is stored in database objects called tables. A table is a collection of related data entries and it consists of columns and rows.

Column: A column is a vertical entity in a table that contains all information associated with a specific field in a table. Every table is broken up into smaller entities called fields. The fields in the Customers table consist of CustomerID, CustomerName, ContactName, Address, City and PostalCode. A field is a column in a table that is designed to maintain specific information about every record in the table.

Row: A record, also called a row, is each individual entry that exists in a table. For example, there are 91 records in the above Customers table. A record or row is a horizontal entity in a table.

3. example for where condition?

## Ans. So the given database for where condition.

Below is a selection from the "Customers" table in the Northwind sample database:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CustomerID** | **CustomerName** | **ContactName** | **Address** | **City** | **PostalCode** | **Country** |
| 1 | Alfreds Futterkiste | Maria Anders | Obere Str. 57 | Berlin | 12209 | Germany |
| 2 | Ana Trujillo Emparedados y helados | Ana Trujillo | Avda. de la Constitución 2222 | México D.F. | 05021 | Mexico |
| 3 | Antonio Moreno Taquería | Antonio Moreno | Mataderos 2312 | México D.F. | 05023 | Mexico |
| 4 | Around the Horn | Thomas Hardy | 120 Hanover Sq. | London | WA1 1DP | UK |
| 5 | Berglunds snabbköp | Christina Berglund | Berguvsvägen 8 | Luleå | S-958 22 | Sweden |

SELECT \* FROM Customers  
WHERE Country='Mexico';

So the result is,

Number of Records: 5

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CustomerID** | **CustomerName** | **ContactName** | **Address** | **City** | **PostalCode** | **Country** |
| 2 | Ana Trujillo Emparedados y helados | Ana Trujillo | Avda. de la Constitución 2222 | México D.F. | 05021 | Mexico |
| 3 | Antonio Moreno Taquería | Antonio Moreno | Mataderos 2312 | México D.F. | 05023 | Mexico |
| 13 | Centro comercial Moctezuma | Francisco Chang | Sierras de Granada 9993 | México D.F. | 05022 | Mexico |
| 58 | Pericles Comidas clásicas | Guillermo Fernández | Calle Dr. Jorge Cash 321 | México D.F. | 05033 | Mexico |
| 80 | Tortuga Restaurante | Miguel Angel Paolino | Avda. Azteca 123 | México D.F. | 05033 | Mexico |

So it means that from the sql syntax we understand that we select all fields from customers of the table where customers from mexico only are choosed for the output.

4. Example for Max, sum, Avg?

Ans. For Max() : returns largest value of selected column.

Below is a selection from the "Products" table in the Northwind sample database:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **ProductID** | **ProductName** | **SupplierID** | **CategoryID** | **Unit** | **Price** |
| 1 | Chais | 1 | 1 | 10 boxes x 20 bags | 18 |
| 2 | Chang | 1 | 1 | 24 - 12 oz bottles | 19 |
| 3 | Aniseed Syrup | 1 | 2 | 12 - 550 ml bottles | 10 |
| 4 | Chef Anton's Cajun Seasoning | 2 | 2 | 48 - 6 oz jars | 22 |
| 5 | Chef Anton's Gumbo Mix | 2 | 2 | 36 boxes | 21.35 |

### SELECT MAX(Price) AS LargestPrice FROM Products;

### Result:

Number of Records: 1

|  |
| --- |
| **largestPrice** |
| 22 |
| For Avg():function returns the average value of a numeric column.  Finds avg price of all products. |
| SELECT AVG(Price) FROM Products; |

Result:

### Result:

Number of Records: 1

|  |
| --- |
| **Expr1000** |
| 28.8664 |

For sum():

Below is a selection from the "OrderDetails" table in the Northwind sample database:

|  |  |  |  |
| --- | --- | --- | --- |
| **OrderDetailID** | **OrderID** | **ProductID** | **Quantity** |
| 1 | 10248 | 11 | 12 |
| 2 | 10248 | 42 | 10 |
| 3 | 10248 | 72 | 5 |
| 4 | 10249 | 14 | 9 |
| 5 | 10249 | 51 | 40 |

SELECT SUM(Quantity)  
FROM OrderDetails;

SQL statement finds the sum of the "Quantity" fields in the "OrderDetails" table

Result:

Number of Records: 1

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5. Example for Group by?

Ans. GROUP BY statement is often used with aggregate functions (COUNT, MAX, MIN, SUM, AVG) to group the result-set by one or more columns.

### GROUP BY Syntax

SELECT column\_name(s)  
FROM table\_name  
WHERE condition  
GROUP BY column\_name(s)ORDER BY column\_name(s);

**Demo Database**

Below is a selection from the "Customers" table in the Northwind sample database:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CustomerID** | **CustomerName** | **ContactName** | **Address** | **City** | **PostalCode** | **Country** |
| 1 | Alfreds Futterkiste | Maria Anders | Obere Str. 57 | Berlin | 12209 | Germany |
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## SQL GROUP BY Examples

The following SQL statement lists the number of customers in each country:

SELECT COUNT(CustomerID), Country  
FROM Customers  
GROUP BY Country;

|  |  |
| --- | --- |
| **CustomerID** | **Country** |
| 1 | Germany |
| 2 | Mexico |
| 3 | Mexico |
| 4 | UK |
| 5 | Sweden |

The following SQL statement lists the number of customers in each country, sorted high to low:

### Example

SELECT COUNT(CustomerID), Country  
FROM Customers  
GROUP BY Country  
ORDER BY COUNT(CustomerID) DESC;

|  |  |
| --- | --- |
| **Number of records:5**  **CustomerID** | **Country** |
| 1 | UK |
| 2 | Sweden |
| 3 | Mexico |
| 4 | Mexico |
| 5 | Germany |

**Demo Database**

Below is a selection from the "Orders" table in the Northwind sample database:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **OrderID** | **CustomerID** | **EmployeeID** | **OrderDate** | **ShipperID** |
| 10248 | 90 | 5 | 1996-07-04 | 3 |
| 10249 | 81 | 6 | 1996-07-05 | 1 |
| 10250 | 34 | 4 | 1996-07-08 | 2 |

And a selection from the "Shippers" table:

|  |  |
| --- | --- |
| **ShipperID** | **ShipperName** |
| 1 | Speedy Express |
| 2 | United Package |
| 3 | Federal Shipping |

## GROUP BY With JOIN Example

The following SQL statement lists the number of orders sent by each shipper:

SELECT Shippers.ShipperName, COUNT(Orders.OrderID) AS NumberOfOrders FROM Orders  
LEFT JOIN Shippers ON Orders.ShipperID = Shippers.ShipperID  
GROUP BY ShipperName;

### Result:

Number of Records: 3

|  |  |
| --- | --- |
| **ShipperName** | **NumberOfOrders** |
| Federal Shipping | 68 |
| Speedy Express | 54 |
| United Package | 74 |

6. Example for Having?

Ans. The HAVING clause was added to SQL because the WHERE keyword could not be used with aggregate functions.

### HAVING Syntax

SELECT column\_name(s)  
FROM table\_name  
WHERE condition  
GROUP BY column\_name(s)HAVING conditionORDER BY column\_name(s);

**Demo Database**

Below is a selection from the "Customers" table in the Northwind sample database:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CustomerID** | **CustomerName** | **ContactName** | **Address** | **City** | **PostalCode** | **Country** |
| 1 | Alfreds Futterkiste | Maria Anders | Obere Str. 57 | Berlin | 12209 | Germany |
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## SQL HAVING Examples

1)The following SQL statement lists the number of customers in each country. Only include countries with more than 5 customers:

SELECT COUNT(CustomerID), Country  
FROM Customers  
GROUP BY Country  
HAVING COUNT(CustomerID) > 2;

Result:

Number of Records: 2

Exp1000 country

2 mexico

2) The following SQL statement lists the number of customers in each country, sorted high to low (Only include countries with more than 5 customers):

### Example

SELECT COUNT(CustomerID), Country  
FROM Customers  
GROUP BY Country  
HAVING COUNT(CustomerID) > 2  
ORDER BY COUNT(CustomerID) DESC;

Result:

No. of records:2

Exp 1000 country

2 mexico

## 3) More HAVING Examples

The following SQL statement lists the employees that have registered more than 10 orders:

### Example

SELECT Employees.LastName, COUNT(Orders.OrderID) AS NumberOfOrders  
FROM (Orders  
INNER JOIN Employees ON Orders.EmployeeID = Employees.EmployeeID)  
GROUP BY LastName  
HAVING COUNT(Orders.OrderID) > 10;

Your Database:

|  |  |
| --- | --- |
| **Tablenames** | **Records** |
| Customers | 91 |
| Categories | 8 |
| Employees | 10 |
| OrderDetails | 518 |
| Orders | 196 |
| Products | 77 |
| Shippers | 3 |
| Suppliers | 29 |

### Result:

Number of Records: 8

|  |  |
| --- | --- |
| **LastName** | **NumberOfOrders** |
| Buchanan | 11 |
| Callahan | 27 |
| Davolio | 29 |
| Fuller | 20 |
| King | 14 |
| Leverling | 31 |
| Peacock | 40 |
| Suyama | 18 |

2) The following SQL statement lists if the employees "Davolio" or "Fuller" have registered more than 25 orders:

### Example

SELECT Employees.LastName, COUNT(Orders.OrderID) AS NumberOfOrders  
FROM Orders  
INNER JOIN Employees ON Orders.EmployeeID = Employees.EmployeeID  
WHERE LastName = 'Davolio' OR LastName = 'Fuller'  
GROUP BY LastName  
HAVING COUNT(Orders.OrderID) > 25;

Result:

Number of Records: 1

|  |  |
| --- | --- |
| **LastName** | **NumberOfOrders** |
| Davolio | 29 |