

Querying SQL Server for Beginners

Kathi Kellenberger
Redgate Software
@aunkathi



Definitions

Word	Meaning
RDBMS	Relational database management system
SQL Server	Microsoft's enterprise level RDBMS
SQL	Structured query language
T-SQL	SQL Server's flavor of SQL
Instance	One installation of SQL Server, more than one allowed on a computer
Database	A physical container, more than one allowed on an instance

More Definitions

Word	Meaning
Table	The object made of columns and rows in a database that holds the data. Conceptually, looks like a spreadsheet
Column	A column has a data type and properties that enforce rules
Row	Each record in a table
Constraint	The rules
Primary Key	A column or columns that uniquely define a row
Foreign Key	A column or columns that point to a row in another table
Schema	A container to organize objects



MyServer

Can contain many tables and other objects like schemas, views, indexes, functions, stored procedures

DB_A

```
CREATE TABLE HumanResources.Department(  
[DepartmentID] [smallint] IDENTITY(1,1) NOT NULL,  
[Name] NVARCHAR(25) NOT NULL,  
[GroupName] NVARCHAR(25) NOT NULL,  
[ModifiedDate] [date] NOT NULL,  
CONSTRAINT [PK_Department_DepartmentID] PRIMARY KEY  
CLUSTERED  
([DepartmentID] ASC)  
)
```

	DepartmentID	Name	GroupName	ModifiedDate
1	1	Engineering	Research and Development	2008-04-30 00:00:00.000
2	2	Tool Design	Research and Development	2008-04-30 00:00:00.000
3	3	Sales	Sales and Marketing	2008-04-30 00:00:00.000
4	4	Marketing	Sales and Marketing	2008-04-30 00:00:00.000
5	5	Purchasing	Inventory Management	2008-04-30 00:00:00.000
6	6	Research and Development	Research and Development	2008-04-30 00:00:00.000
7	7	Production	Manufacturing	2008-04-30 00:00:00.000
8	8	Production Control	Manufacturing	2008-04-30 00:00:00.000
9	9	Human Resources	Executive General and Administration	2008-04-30 00:00:00.000
10	10	Finance	Executive General and Administration	2008-04-30 00:00:00.000
11	11	Information Services	Executive General and Administration	2008-04-30 00:00:00.000
12	12	Document Control	Quality Assurance	2008-04-30 00:00:00.000
13	13	Quality Assurance	Quality Assurance	2008-04-30 00:00:00.000
14	14	Facilities and Maintenance	Executive General and Administration	2008-04-30 00:00:00.000
15	15	Shipping and Receiving	Inventory Management	2008-04-30 00:00:00.000
16	16	Executive	Executive General and Administration	2008-04-30 00:00:00.000

Schema

```
CREATE TABLE HumanResources.Department(  
  [DepartmentID] [smallint] IDENTITY(1,1) NOT NULL,  
  [Name] NVARCHAR(25) NOT NULL,  
  [GroupName] NVARCHAR(25) NOT NULL,  
  [ModifiedDate] [date] NOT NULL,  
  CONSTRAINT [PK_Department_DepartmentID] PRIMARY KEY  
  CLUSTERED ([DepartmentID] ASC)  
)
```

Table

```
CREATE TABLE HumanResources.Department(  
  [DepartmentID] [smallint] IDENTITY(1,1) NOT NULL,  
  [Name] NVARCHAR(25) NOT NULL,  
  [GroupName] NVARCHAR(25) NOT NULL,  
  [ModifiedDate] [date] NOT NULL,  
  CONSTRAINT [PK_Department_DepartmentID] PRIMARY KEY  
  CLUSTERED ([DepartmentID] ASC)  
)
```

Auto-increment

```
CREATE TABLE HumanResources.Department(  
  [DepartmentID] [smallint] IDENTITY(1,1) NOT NULL,  
  [Name] NVARCHAR(25) NOT NULL,  
  [GroupName] NVARCHAR(25) NOT NULL,  
  [ModifiedDate] [date] NOT NULL,  
  CONSTRAINT [PK_Department_DepartmentID] PRIMARY KEY  
CLUSTERED ([DepartmentID] ASC)  
)
```


Constraint:

Value must be filled in

```
CREATE TABLE HumanResources.Department(  
    [DepartmentID] [smallint] IDENTITY(1,1) NOT NULL,  
    [Name] NVARCHAR(25) NOT NULL,  
    [GroupName] NVARCHAR(25) NOT NULL,  
    [ModifiedDate] [date] NOT NULL,  
    CONSTRAINT [PK_Department_DepartmentID] PRIMARY KEY  
    CLUSTERED ([DepartmentID] ASC)  
)
```

Data types

```
CREATE TABLE HumanResources.Department(  
  [DepartmentID] [smallint] IDENTITY(1,1) NOT NULL,  
  [Name] NVARCHAR(25) NOT NULL,  
  [GroupName] NVARCHAR(25) NOT NULL,  
  [ModifiedDate] [date] NOT NULL,  
  CONSTRAINT [PK_Department_DepartmentID] PRIMARY KEY  
  CLUSTERED ([DepartmentID] ASC)  
)
```

```
CREATE TABLE HumanResources.Department(  
[DepartmentID] [smallint] IDENTITY(1,1) NOT NULL,  
[Name] NVARCHAR(25) NOT NULL,  
[GroupName] NVARCHAR(25) NOT NULL,  
[ModifiedDate] [date] NOT NULL,
```

Primary Key

```
CONSTRAINT [PK_Department_DepartmentID] PRIMARY KEY  
CLUSTERED ([DepartmentID] ASC)
```

```
)
```

Getting around SSMS

The screenshot displays the SQL Server Enterprise Manager (SSMS) interface. On the left, the Object Explorer shows the server hierarchy for 'localhost\SQL2017 (SQL Server 14.0.3038.14 - RED-GATE\Kathi.Kellenberger)'. The 'Databases' folder is expanded, showing 'AdventureWorks2014' and 'AdventureWorks2017'. Under 'AdventureWorks2017', the 'Tables' folder is expanded, showing 'HumanResources.Department' and 'HumanResources.Employee'. The 'Columns' folder for 'HumanResources.Department' is expanded, showing 'DepartmentID (PK, smallint, not null)', 'Name (Name(nvarchar(50)), not null)', 'GroupName (Name(nvarchar(50)), not null)', and 'ModifiedDate (datetime, not null)'. The SQL Query window on the right shows the query 'select * from HumanResources.Department'. The query results are displayed in a table with 5 columns: 'DepartmentID', 'Name', 'GroupName', and 'ModifiedDate'. The results show 16 rows of data.

	DepartmentID	Name	GroupName	ModifiedDate
1	1	Engineering	Research and Development	2008-04-30 00:00:00.000
2	2	Tool Design	Research and Development	2008-04-30 00:00:00.000
3	3	Sales	Sales and Marketing	2008-04-30 00:00:00.000
4	4	Marketing	Sales and Marketing	2008-04-30 00:00:00.000
5	5	Purchasing	Inventory Management	2008-04-30 00:00:00.000
6	6	Research and Development	Research and Development	2008-04-30 00:00:00.000
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10	10	Finance	Executive General and Administration	2008-04-30 00:00:00.000
11	11	Information Services	Executive General and Administration	2008-04-30 00:00:00.000
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16	16	Executive	Executive General and Administration	2008-04-30 00:00:00.000

DEMO: Using SSMS

SSMS Tips and Tricks

- Right-click a table to create a query of top 1000 rows
- Pull table and column names from Object Explorer to query window
- Pull the word “columns” to get a list of the columns
- Select code to run instead of running everything
- Query designer (use to learn, not as a crutch)
- Right-click to script out definitions
- Take advantage of IntelliSense, better yet, use a tool like SQL Prompt to help you write the query
- Add comments to code

The SELECT statement

```
SELECT *  
FROM schema1.table1;
```

This statement returns all columns and all rows from table1.

CAUTION! Exploratory only. Don't do this in production code!!

The SELECT statement

```
SELECT col1, col2, col3  
FROM schema1.table1;
```

This statement returns all the rows, but just the three columns from table1

DEMO: Writing SQL Statements

Filtering

```
SELECT col1, col2, col3  
FROM schema1.table1  
WHERE col1 = 5;
```

This statement returns col1, col2 and col3 from table1, but only for the rows where col1 is 5

Operators

- =, <>, !=
- <, >, <=, >=
- IN
- BETWEEN
- LIKE (% most common wildcard, replaces 0 or more characters)
- NOT
- AND, OR
- IS NULL
- Parentheses to enforce logic

Query filters can become very complex!

DEMO: Filtering

NULL

Means a value has not been entered

NOT 0, NOT an empty string

You can't compare anything to NULL

```
SELECT col1, col2, col3
```

```
FROM schema1.table1
```

```
WHERE col1 IS NULL;
```

DEMO: Nulls

Ordering

```
SELECT col1, col2, col3  
FROM schema1.table1  
ORDER BY col3 DESC;
```

Returns col1, col2, and col3 from all the rows from table1, but they are in descending order of col3

DEMO: Ordering

Resources

- Beginning T-SQL, 3rd Edition
- Lots of training classes
 - Code Academy
 - Pluralsight
 - Udemy
 - Redgate University
- PASS.org
- Auntkathisql.com
- Simple Talk

