

# Databases

Introduction to databases

What is a database?

## What is a database?

An **organized** collection of data that is **saved** and can be **retrieved** from a database management system

Microsoft SQL Server

Microsoft SQL Server Management Studio

Microsoft SQL Database

## Why a database?

## Why not simple textfile?

MyCustomers.txt

```
1, Alma Hanssonn, Storgatan 3A 3tr, Göteborg  
2, Håkon Johansen, Fiskevei 12, Oslo  
3, Tiril Olsen, Vegagate 5, Bergen
```

Solidity

Security

Performance

Standard

# SQL

# SQL

What can you do?



# SQL

A standard

# Intro

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

int  
decimal  
varchar(50)  
datetime

# Intro

Here is an example of a SQL-command which get all rows in the Customer-table:

```
SELECT * from Customers
```

Another example which only get two columns:

```
SELECT CustomerName, City  
FROM Customers;
```

Only get the rows for customers living in Mexico:

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

# Intro

Get customers who lives in another country than Germany and USA:

```
SELECT * FROM Customers  
WHERE NOT Country='Germany' AND NOT Country='USA';
```

First sort the customer by country. Then sort by name:

```
SELECT * FROM Customers  
ORDER BY Country, CustomerName;
```

There are also command for inserting a single row in a table:

```
INSERT INTO Customers (CustomerName, ContactName, Address, City,  
PostalCode, Country)  
VALUES ('Cardinal', 'Tom B. Erichsen', 'Skagen 21', 'Stavanger',  
'4006', 'Norway');
```

# Intro

...and update:

```
UPDATE Customers  
SET ContactName = 'Alfred Schmidt', City= 'Frankfurt'  
WHERE CustomerID = 1;
```

...and removing:

```
DELETE FROM Customers  
WHERE CustomerName='Alfreds Futterkiste';
```

# Intro

You can even create a whole new table with SQL:

```
CREATE TABLE Persons (  
    PersonID int,  
    LastName varchar(255),  
    FirstName varchar(255),  
    Address varchar(255),  
    City varchar(255)  
);
```

Data **Definition** Language

Data **Manipulation** Language

**Transaction** Control Language

Data **Control** Language



# Data Definition Language

Create a table

```
CREATE TABLE employees (  
    id            INTEGER      PRIMARY KEY,  
    first_name    VARCHAR(50)  not null,  
    last_name     VARCHAR(75)  not null,  
    fname        VARCHAR(50)  not null,  
    dateofbirth   DATE         not null  
);
```

Remove a table

```
DROP TABLE employees;
```

Change a table

```
ALTER TABLE sink ADD bubbles INTEGER;
```

Delete all data in a table (faster than DELETE)

```
TRUNCATE TABLE Employees;
```

```
RENAME
```

# Data Manipulation Language



```
SELECT  
INSERT  
UPDATE  
DELETE
```

# Transaction Control Language



COMMIT  
ROLLBACK

## Data Control Language



GRANT  
REVOKE

Data **Definition** Language

Data **Manipulation** Language

**Transaction** Control Language

Data **Control** Language

End of presentation