SQL DDL

- Intro SQL
- CREATE TABLE
- ALTER TABLE
- Data types
- Service-based database in Visual Studio
- Database in PHPMyAdmin

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Languages

- Languages for relational DBMSs are:
  - SQL
    - Structured Query Language
  - QBE
    - Query by example
    - A graphical frontent to SQL
    - Will convert into corresponding SQL

SQL

- Two main parts:
  - Data Definition Language (DDL)
    - To define the database ***structure***
  - Data Manipulation Language (DML)
    - For retrieving and updating the ***content*** (the data)
- Two ways of using SQL:
  - Interactive
  - Embedded in a procedural language as Java, C#, PHP etc.

SQL

- ISO standard
- A standard database language
- There are many versions of SQL (aka DBMS: database management systems): SQL Server, DB2, MySQL, Oracle, Informix, Ingres etc.
- Nearly every database is based on standard SQL, but ”dialects” exist (e.g. in Oracle)
- SQL Server uses T-SQL
- Non-procedural language
  - Specify ”What” and not ”How”

Data definition Language(DDL)

- Statements that are used to define the database structure:
  - CREATE - to create tables in the database
  - ALTER - alters the structure of tables in the database
  - DROP - deletes tables in the database
- We look at create table
- Can be done through a GUI interface or through a so-called query window

HotelDB

HOTEL:(Hotel_No, Name, Address)

ROOM:(Room_No, Hotel_No, Types, Price)

BOOKING:(BookingID, Hotel_No, Guest_No, Date_From, Date_To, Room_No)

GUEST:(Guest_No, Name, Address)

Create Database

```
CREATE DATABASE HotelDb
```

Creates a database.

Creating tables

- Creating a table (simplified):

```
CREATE TABLE Hotel
(<field definitions>
PRIMARY KEY <field list>)
```

- Complete syntax for creating a new table is rather complicated
- See description of syntax at e.g. https://msdn.microsoft.com/en-us/library/ms174979.aspx

Creating tables

- Each field definition contains
  - The field name
  - The data type for the field
  - Can the field be NULL or not
  - Must the field be unique
  - Does the field have a default value

Create Table Hotel

SQL Server:

```
CREATE TABLE Hotel(
    Hotel_No  int IDENTITY(1,1) NOT NULL PRIMARY KEY,
    Name      VARCHAR(30)     NOT NULL,
    Address   VARCHAR(50)  NOT NULL
);
```

MySQL:

```
CREATE TABLE Hotel(
    Hotel_No  int NOT NULL AUTO_INCREMENT PRIMARY KEY,
    Name      VARCHAR(30)     NOT NULL,
    Address   VARCHAR(50)  NOT NULL
);
```

Creating Table Room

```
CREATE TABLE Room(
                 Room_No   int    NOT NULL,
                Hotel_No  int    NOT NULL,
                Types     CHAR(1)   DEFAULT 'S',
                Price     FLOAT,
                CONSTRAINT checkType
                CHECK (Types IN ('D','F','S') OR Types IS NULL),
                CONSTRAINT checkPrice
                CHECK (price BETWEEN 0 AND 9999),

                FOREIGN KEY (Hotel_No) REFERENCES Hotel (Hotel_No)
                ON UPDATE CASCADE ON DELETE NO ACTION,
                Primary KEY (Room_No, Hotel_No)
);
```

Creating table Guest

```
CREATE TABLE Guest (
    Guest_No  int  NOT NULL PRIMARY  KEY,
    Name      VARCHAR(30)      NOT NULL,
    Address   VARCHAR(50)   NOT NULL
);
```

Creating Table Booking

```
CREATE TABLE Booking(
    Booking_id int IDENTITY(1,1) NOT NULL PRIMARY KEY,
  Hotel_No  int   NOT NULL,
    Guest_No  int   NOT NULL,
    Date_From DATE  NOT NULL,
    Date_To   DATE  NOT NULL,
    Room_No   int   NOT NULL,
    FOREIGN KEY(Guest_No) REFERENCES Guest(Guest_No),
    FOREIGN KEY(Room_No, Hotel_No) REFERENCES
            Room(Room_No, Hotel_No)
);
```

Above syntax is for SQL Server – see slide 10 for MySQL syntax

Alter Table

```
ALTER TABLE Booking
ADD CONSTRAINT incorrect_dates
    CHECK ((Date_To > Date_From) AND (Date_From <=
        '2014-01-01'));
```

NB! The above is only an example – don’t implement this in your Booking table → you won’t be able to make any new bookings!!!

Data types for various DBMS

http://www.w3schools.com/sql/sql_datatypes.asp

Service-based database in Visual Studio

- To have a place to experiment with SQL (a ”sand box”) you must make a so-called ***service-based database***

- Make a new project (WPF, Windows form, Console) – ***not*** Windows Store app

- Right-click on the project and choose ”Add new item”

- Choose ***Data + Service-based database***

- The database can now be seen in the Solution explorer window

- Double-click on the database, and the Server explorer window is shown

- You can now work with the database (”the right-click method” or ”the Query window method”)

Database in PHPMyAdmin

- Logon to phpmyadmin on your domain – in One.com you can find it under the control panel

- Normally PHPMyadmin will only support one database in the free version

- The database is selected, and you can start creating tables

- Tables can be created either clicking the “Create table” button or by writing a CREATE TABLE command in the SQL window

- New records can be inserted either through the Insert window or by writing an INSERT INTO command in the SQL window

Exercise – SQL DDL queries

- Create a database to hold all the hotel related SQL tables.

- Experiment creating a demo table (no connection with hotel case)

- Create the necessary tables for the hotel case by copy/pasting the content of the file ***SQLCreateHotel.sql*** into a query window and executing it

- Insert data into the created tables by by copy/pasting the content of the file ***SQLInsertHotel.sql*** into a query window and executing it