

# CPTR 319 Chapter 11 Lecture Notes<sup>1</sup>

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## Installing SQL Server

Start Here <http://www.microsoft.com/sql/editions/express/default.msp>

- Server Install at: <http://msdn2.microsoft.com/en-us/express/bb410792.aspx>
- Make a point of SQL Server Management Studio Express!
- Server runs as a service: Open services and show them how to start it.

## Creating a Database

### First Create a Database

- Right click and show them the process of creating VRG

Remind students we did this using SQL statements

- Open then in the query analyzer and show them the two buttons For
  - Checking the syntax
  - Running the query
- DO IT: Show them the results in the Art Database
- Right click a table and show them the Design View (See Figure 1)
- Right click in the white space and select **check constraints...** (See Figure 2)
- Open the diagram so they can see the relationships graphically

## Entering Data

- Inserts we covered...
- Open table ...

## Creating a View

- Create the view using SQL statement

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<sup>1</sup> Kroenke, *Database Processing Fundamentals, Design, and Implementation*. Prentice Hall. 2006

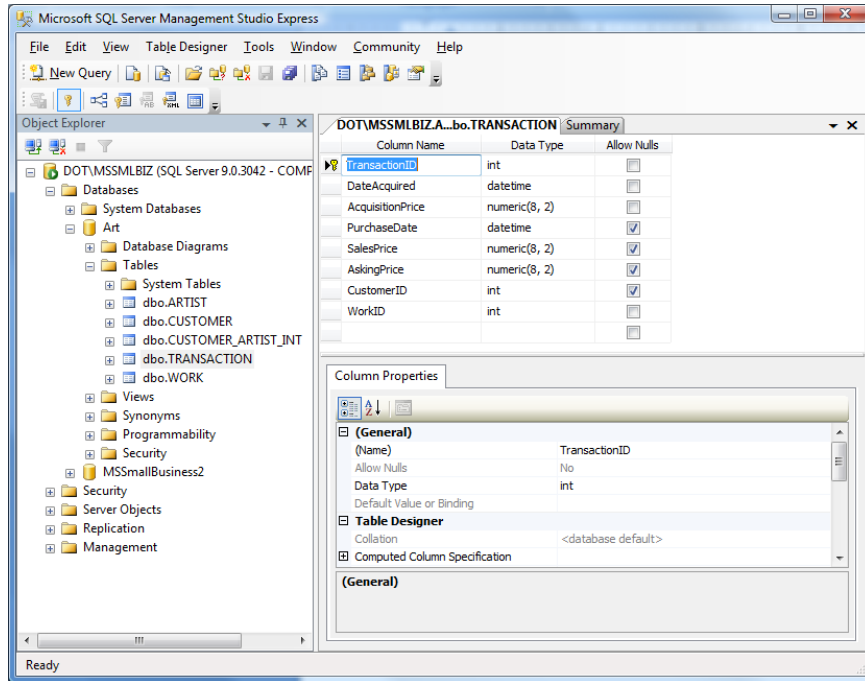


Figure 1

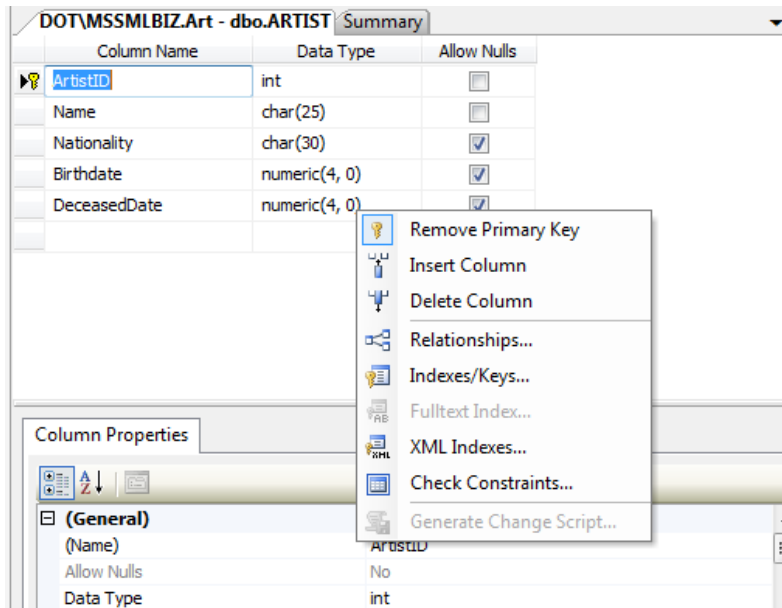


Figure 2

## Indexes

- Review: Indexes are special data structures that are created to improve search performance
- Indexes are always created on **Primary and Foreign Keys**
- Create an index on zip code for the CUSTOMER table.
  - Click the + on CUSTOMER ...
  - Check
    - Pad Index
    - Fill Factor = 80
    - File Group = Primary
  - Click on the script drop down to show the SQL (NICE FEATURE HUH!!)
- What does clustered and Non-clustered mean? Also Primary and Secondary...

## Application Logic

There is a problem with this section: AK1 for customer requires a unique email. This is not reasonable since not everyone has entered the information age. After each insert you currently need to assign an email address.

## Stored Procedures

- Create vs Alter
  - CREATE PROCEDURE the first time
  - ALTER PROCEDURE subsequent times.
  - Go through the Stored Procedure given and then show what happens when you want to alter it.
  - Run the InsertCustomer

## Transactions in Stored Procedures

- Open and review CH11\_07...
- Execute the creation of the stored procedure
- Open and execute CH11\_08...

## Triggers

- 10 – Problem Account Trigger
- 12 – Nationality Trigger
- 13 – Update View Trigger
- Triggers for Figure 11-25 are left as exercises...

## Concurrency Control

DBMS is determined by three things:

1. Transaction Isolation Level
2. Cursor Concurrency setting
3. Locking Hints (We won't consider these)

With SQL Server

1. Developers do not place explicit locks
2. Just describe the behavior and let the DBMS figure it out
3. Locks can be placed on
  - a. Rows
  - b. Pages
  - c. Keys
  - d. Indexes
  - e. Tables
  - f. Entire database
4. Locks can be changed during processing

## Transaction Isolation Level

Broadest Level of settings

1. READ UNCOMMITTED (allowing dirty reads)
2. READ COMMITTED (**default level**)
3. REPEATABLE READ
  - a. Places and hold locks on all rows that are read!
  - b. Re-reading the cursor may result in phantom reads – allows inserts
4. SERIALIZABLE
  - a. A range of locks are issued that will not allow a change
  - b. NO inserts are allowed that would appear in the range specified

## Cursor Concurrency

Per-Cursor setting levels are

1. Read Only
2. Optimistic
3. SCROLL\_LOCK
  - a. A type of **pessimistic** lock
  - b. Places an *update lock* that allows shared locks allowing other applications to read the data
  - c. IF the cursor is opened outside a transaction, the update lock is dropped when the cursor moves to another row.
  - d. IF the cursor is opened inside a transaction, the lock is held until commit or roll back

```
DECLARE MY_CURSOR CURSOR DYNAMIC SCROLL_LOCKS
FOR
    SELECT *
    FROM dbo.TRANS
```

## Locking Hints

We will not cover Locking Hints! No test item and these are seldom used.

## SQL Server Security

- How to configure SQL Server Security for .NET Applications:  
<http://support.microsoft.com/kb/815154>
- Right DOT and select Security talk about Options...

### Server Proxy Account

#### Enable server proxy account

Enables an account for use by **xp\_cmdshell**. Proxy accounts allow for the impersonation of logins, server roles, and database roles when an operating system command is being executed.

#### Caution:

The login used by the server proxy account should have the least privileges required to perform the intended work. Excessive privileges for the proxy account could be used by a malicious user to compromise your system security.

- Under Security, Logins, Show user scanders
  - General: Username password etc.
  - Server Roles: Public allows me to connect but that's it! I have to have Specific DB writes to do more.
  - User Mapping we see Database role membership. Information about each role can be found at <http://msdn2.microsoft.com/en-us/library/ms189121.aspx>
  - Securables is beyond the scope or our consideration at the moment
  - Status

Now compare this to...

- Databases, VRG, Security, Users, scanders (this is about the database itself!)
  - General is about security related to this database NOTICE that I have the roles assigned in the previous section shown here too.
  - Securables provide finer grained security.
    - Add the views for scanders and show that we now have specific control for each view selected
    - Show effective permissions with/without deny delete and update checked.

## Backup and Recovery

Briefly show backup and recover if time.

- Right Click the Database
  - Backup
  - Recovery