

## Lab 4

Connection values:

Server Type = Database Engine

Server Name = is-swang01.ischool.uw.edu

Authentication = SQL Server Authentication

Login = INF06210

Password = NEUHusky!

## -- Create a database and some tables in the new database.

```
CREATE DATABASE "Use your name for the database name";
GO
```

```
USE "Use your name for the database name";
```

```
CREATE TABLE dbo.Customers
(
    CustomerID varchar(5) NOT NULL PRIMARY KEY ,
    Name varchar(40) NOT NULL
);
```

```
CREATE TABLE dbo.Orders
(
    OrderID int IDENTITY NOT NULL PRIMARY KEY,
    CustomerID varchar(5) NOT NULL
        REFERENCES Customers(CustomerID),
    OrderDate datetime DEFAULT Current_Timestamp
);
```

```
CREATE TABLE dbo.Products
(
    ProductID int IDENTITY NOT NULL PRIMARY KEY,
    Name varchar(40) NOT NULL,
    UnitPrice money NOT NULL
);
```

```
CREATE TABLE dbo.OrderItems
(
    OrderID int NOT NULL
        REFERENCES dbo.Orders(OrderID),
    ProductID int NOT NULL
        REFERENCES dbo.Products(ProductID),
    UnitPrice money NOT NULL,
    Quantity int NOT NULL
        CONSTRAINT PKOrderItem PRIMARY KEY CLUSTERED
            (OrderID, ProductID)
);
```

## -- Put some data in the database

-- INSERT sample records

```
INSERT dbo.Customers  
VALUES ('ABC', 'Bob''s Pretty Good Garage');
```

```
INSERT dbo.Orders (CustomerID)  
VALUES ('ABC');
```

```
INSERT dbo.Products  
VALUES ('Widget', 5.55),  
       ('Thingamajig', 8.88)
```

```
INSERT dbo.OrderItems  
VALUES (1, 1, 5.55, 3);
```

/\*

**If you create a table without specifying constraints,  
You can use ALTER TABLE to add a constraint**

\*/

-- Create a table without specifying constraints.

```
CREATE TABLE TBL3 (pk3 int);
```

-- Add the NOT NULL constraint

```
ALTER TABLE tbl3 ALTER COLUMN pk3 int not null;
```

-- Add the Primary Key constraint.

```
ALTER TABLE tbl3 ADD CONSTRAINT key3 PRIMARY KEY (pk3);
```

-- Add the Foreign Key constraint.

-- Create the parent table first.

```
CREATE TABLE TBL1 (pk1 int PRIMARY KEY);
```

```
ALTER TABLE tbl3 ADD CONSTRAINT R3 FOREIGN KEY (pk3)  
REFERENCES tbl1(pk1)
```

-- Must DROP the child table before dropping the parent table.

```
DROP TABLE TBL3;
```

```
DROP TABLE TBL1;
```

## -- A simple example of WHILE Statement

```
/*
    SQL variables start with either @ or @@.
    @ indicates a local variable, which is in effect in the current
    scope.
    @@ indicates a global variable, which is in effect for all
    scopes of the current connection.
*/

/*
    We need to make sure that we have a way to stop the WHILE loop.
    Otherwise, we'll have an endless WHILE loop which may run forever.
    We use the variable @counter to determine when to terminate
    the WHILE loop.
    We use CAST to convert an integer to character(s) so that we
    can concatenate the integer with other characters.
*/

DECLARE @counter INT
SET @counter = 0
WHILE @counter <> 5
    BEGIN
        SET @counter = @counter + 1
        PRINT 'The counter : ' + CAST(@counter AS CHAR)
    END
END
```

**-- Use a Nested Loop to populate your table.**

-- Create a test table.

```
CREATE TABLE PART (Part_Id int, Category_Id int,  
    Description varchar(50));
```

-- The statements highlighted in yellow must be executed together

-- Declare SQL variables.

```
DECLARE @Part_Id int;  
DECLARE @Category_Id int;  
DECLARE @Desc varchar(50);
```

-- Initilize SQL variables.

```
SET @Part_Id = 0;  
SET @Category_Id = 0;
```

-- Populate the test table.

```
WHILE @Part_Id < 10  
BEGIN  
    SET @Part_Id = @Part_Id + 1;  
    WHILE @Category_Id < 3  
    BEGIN  
        SET @Category_Id = @Category_Id + 1;  
        SET @Desc = 'Part_Id is ' + cast(@Part_Id as char(1)) +  
            ' Category_Id ' + cast(@Category_Id as char(1));  
        INSERT INTO PART VALUES (@Part_Id,  
                                @Category_Id,  
                                @Desc );  
    END;  
    SET @Category_Id = 0;  
END;
```

-- Retrieve the test data.

```
SELECT * FROM PART;
```

-- Drop the test table.

```
DROP TABLE PART;
```

## -- SQL View

```
USE AdventureWorks2008R2;
```

```
-- CREATE VIEW Command
```

```
-- You need to execute these statements on your own computer
```

```
CREATE VIEW vwEmployeeContactInfo
AS
SELECT e.[BusinessEntityID] as [ContactID], FirstName,
       MiddleName, LastName, JobTitle
FROM Person.Person c
INNER JOIN HumanResources.Employee e
       ON c.BusinessEntityID = e.BusinessEntityID;
```

```
-- Select from the view
```

```
SELECT *
FROM vwEmployeeContactInfo;
```

```
-- See the script that generated the view
```

```
EXEC sp_helptext vwEmployeeContactInfo;
```

```
-- Delete the view from the database
```

```
DROP VIEW vwEmployeeContactInfo;
```

```
/*  
    Create a view to include the encryption and  
    schemabinding options. Encryption protects the  
    view query definition. Schemabinding means the  
    definition of the database object(s) on which  
    the view is defined can not be changed without  
    first dropping the view.  
*/
```

```
CREATE VIEW vwEmployeeContactInfo  
WITH ENCRYPTION, SCHEMABINDING  
AS  
SELECT e.[BusinessEntityID] as [ContactID], FirstName,  
        MiddleName, LastName, JobTitle  
FROM Person.Person c  
INNER JOIN HumanResources.Employee e  
        ON c.BusinessEntityID = e.BusinessEntityID;
```

```
/*  
    Alter the view to remove schemabinding - must  
    restate everything, including changes.  
*/
```

```
ALTER VIEW vwEmployeeContactInfo  
WITH ENCRYPTION  
AS  
SELECT e.[BusinessEntityID] as [ContactID], FirstName,  
        MiddleName, LastName, JobTitle  
FROM Person.Person c  
INNER JOIN HumanResources.Employee e  
        ON c.BusinessEntityID = e.BusinessEntityID;
```



# Lab 4 Questions

## Part A

Step 1) Create a new database of the format: LASTNAME\_FIRSTNAME\_TEST

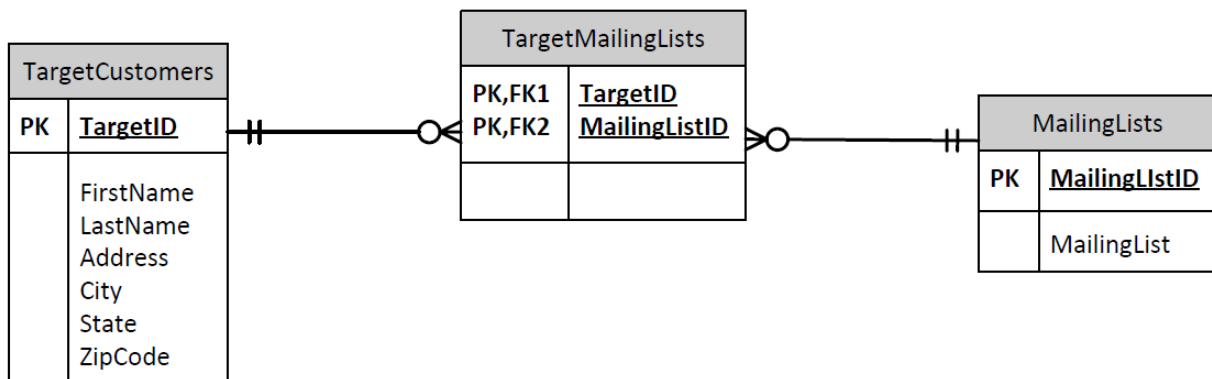
Step 2) Within this database, experiment creating, altering, and dropping tables and columns. Put in sample data and play around with other kinds of queries. Write at least 20 SQL statements for this step.

**Note: 1 point for Step 2**

Step 3) Eventually, create 3 tables and the corresponding relationships to implement the ERD below in the database.

**Note: 2 points for Step 3**

Step 4) Keep track of all the code you write and submit it to Blackboard.



## Part B (1.5 points)

Using the content of an AdventureWorks database, write a query to list all distinct products included in an order for all orders. The report needs to have the following format. Sort the returned data by the sales order id column. Within each order, sort the products in the ascending order.

43659 709, 711, 712, 714, 716, 771, 772, 773, 774, 776, 777, 778

43660 758, 762

43661 708, 711, 712, 715, 716, 741, 742, 743, 745, 747, 773, 775, 776, 777, 778

**Part C** (1.5 points)

/\* Bill of Materials - Recursive \*/

/\* The following code retrieves the components required for manufacturing "Mountain-500 Black, 48" (Product 992). Modify the code to retrieve the most expensive component(s) at each component level. Use the list price of a component to determine the most expensive component for each level. Sort the returned data by the component level. \*/

```
WITH Parts(AssemblyID, ComponentID, PerAssemblyQty, EndDate, ComponentLevel)
AS
(
    SELECT b.ProductAssemblyID, b.ComponentID, b.PerAssemblyQty,
           b.EndDate, 0 AS ComponentLevel
    FROM Production.BillOfMaterials AS b
    WHERE b.ProductAssemblyID = 992 AND b.EndDate IS NULL

    UNION ALL

    SELECT bom.ProductAssemblyID, bom.ComponentID, p.PerAssemblyQty,
           bom.EndDate, ComponentLevel + 1
    FROM Production.BillOfMaterials AS bom
    INNER JOIN Parts AS p
    ON bom.ProductAssemblyID = p.ComponentID AND bom.EndDate IS NULL
)
SELECT AssemblyID, ComponentID, Name, PerAssemblyQty, ComponentLevel
FROM Parts AS p
INNER JOIN Production.Product AS pr
ON p.ComponentID = pr.ProductID
ORDER BY ComponentLevel, AssemblyID, ComponentID;
```

## **Useful Links**

### **Some great discussions about naming conventions**

<http://social.msdn.microsoft.com/Forums/sqlserver/en-US/fc76df37-f0ba-4cae-81eb-d73639254821/sql-server-naming-convention?forum=databasedesign>

### **Create Database Using SQL Server Management Studio**

[http://www.youtube.com/watch?v=J59MGbQ\\_Shc](http://www.youtube.com/watch?v=J59MGbQ_Shc)

### **Create Tables Using SQL Server Management Studio**

<http://technet.microsoft.com/en-us/library/ms188264.aspx>

### **Create Tables Using SQL Server Management Studio**

<http://www.youtube.com/watch?v=8l5Hw4kQE8o>

### **Data Types**

<http://msdn.microsoft.com/en-us/library/ms187752.aspx>

### **Create View**

<http://technet.microsoft.com/en-us/library/ms187956.aspx>

### **How to Create a View**

[http://www.youtube.com/watch?v=MK\\_dWEcltWY](http://www.youtube.com/watch?v=MK_dWEcltWY)