Lab 5

Connection values:

Server Type = Database Engine
Server Name = boyce.coe.neu.edu
Authentication = SQL Server Authentication
Login = INFO6210
Password = NEUHusky!

```
/*
   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.
*/
```

-- A simple example of Stored Procedure

```
-- Set the database context
USE “The name of a database you have created.” ;
```

--Create a stored procedure with INPUT and OUTPUT parameters

```
/* A parameter has a data type, such as INT (integer).
   If a parameter will return a value, we specify the OUTPUT keyword.
   If we have only a single SQL statement after IF and/or ELSE,
   we don’t have to use BEGIN .... END, but if we have multiple
   statements, we have to put them in the BEGIN .... END block. */

CREATE PROCEDURE MyFirstProcedure
   @InNumber INT,
   @OutNumber INT OUTPUT
AS
BEGIN
   IF @InNumber < 0
         SET @OutNumber = 0;
   ELSE
      BEGIN
         SET @OutNumber=@InNumber + 1;
      END
   PRINT @OutNumber;
END

-- The statements highlighted in yellow must be executed together

-- Declare variables
DECLARE @MyInput INT;
DECLARE @MyOutput INT;

-- Initilize variable
SET @MyInput = 3;

-- Execute the procedure
EXEC MyFirstProcedure @MyInput, @MyOutput OUTPUT;

-- See result
SELECT @MyOutput;

-- Drop the procedure so that you can recreate it
DROP PROC MyFirstProcedure;
```

-- Use TRY and CATCH for error handling in a Stored Procedure

**/*
TRY contains regular SQL statements we execute to accomplish a task.
CATCH contains SQL statements used to handle the error if an error has Occurred.
*/**

```
USE “The name of a database you have created.” ;

GO


-- The statements highlighted in yellow must be executed together

BEGIN TRY
    BEGIN TRANSACTION;

    DELETE FROM AdventureWorks2008R2.Production.Product
        WHERE ProductID = 980;

    -- If the delete operation succeeds, commit the transaction.
    COMMIT TRANSACTION;
END TRY

BEGIN CATCH

    PRINT 'UNABLE TO DELETE PRODUCT!';

    -- Roll back any active or uncommittable transactions
    IF XACT_STATE() <> 0
    BEGIN
        ROLLBACK TRANSACTION;
    END;

END CATCH;
```

-- Simple examples of Functions

```
USE “The name of a database you have created.” ;

-- Create a scalar function
-- FUNCTION accepts Argument(s)
-- In this example, @Country is the argument.
-- FUNCTION uses the RETURN statement to return the value

CREATE FUNCTION whichContinent
(@Country nvarchar(15))
RETURNS varchar(30)
AS
BEGIN
      DECLARE @ReturnC varchar(30);

      SELECT @ReturnC = CASE @Country
                  when 'Argentina' then 'South America'
                  when 'Belgium' then 'Europe'
                  when 'Brazil' then 'South America'
                  when 'Canada' then 'North America'
                  when 'Denmark' then 'Europe'
                  when 'Finland' then 'Europe'
                  when 'France' then 'Europe'
                ELSE 'Unknown'
                END;

      RETURN @returnC;
END

-- Execute the new function

SELECT dbo.whichContinent('Canada');
```

```
USE “The name of a database you have created.” ;


-- Create a table-valued function

CREATE FUNCTION dbo.GetDateRange
(@StartDate date, @NumberOfDays int)
RETURNS @DateList TABLE (Position int, DateValue date)
AS BEGIN
    DECLARE @Counter int = 0;
    WHILE (@Counter < @NumberOfDays)
    BEGIN
        INSERT INTO @DateList
            VALUES(@Counter + 1,
                   DATEADD(day,@Counter,@StartDate));
        SET @Counter += 1;
    END
    RETURN;
END
GO

-- Execute the new function

SELECT * FROM dbo.GetDateRange('2009-12-31',14);
```

```
USE “The name of a database you have created.” ;

-- Create a table-valued function

CREATE FUNCTION GetLastOrdersForCustomer
(@CustomerID int, @NumberOfOrders int)
RETURNS TABLE
AS
RETURN (SELECT TOP(@NumberOfOrders)
               SalesOrderID,
               OrderDate,
               PurchaseOrderNumber
        FROM AdventureWorks2008R2.Sales.SalesOrderHeader
        WHERE CustomerID = @CustomerID
        ORDER BY OrderDate DESC, SalesOrderID DESC
        );
GO

-- Execute the new function

SELECT * FROM GetLastOrdersForCustomer(17288,2);
```

-- A simple example of WHILE Statement

```
/*
   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 in this example.
   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;
```

Lab 5 Questions

Note: 1.5 points for each question.

Lab 5-1

```
/* Create a function in your own database that takes three
   parameters:

   1) A year parameter
   2) A month parameter
   3) A color parameter

   The function then calculates and returns the total sales
   for products in the requested color during the requested
   year and month. If there was no sale for the requested period,
   returns 0.

   Hints: a) Use the TotalDue column of the
             Sales.SalesOrderHeader table in an
             AdventureWorks database for
             calculating the total sale.
          b) The year and month parameters should use
             the INT data type. The color parameter
             should use varchar.
          c) Make sure the function returns 0 if there
             was no sale in the database for the requested
             period.
          d) Use data from AdventureWorks2008R2 */
```

Lab 5-2

```
/* Using data from AdventureWorks2008R2, create a function that accepts
   a customer id and returns the full name (last name + first name)
   of the customer. */
```

Lab 5-3

```
/* With three tables as defined below: */

CREATE TABLE Customer
(CustomerID INT PRIMARY KEY,
 CustomerLName VARCHAR(30),
 CustomerFName VARCHAR(30));

CREATE TABLE SaleOrder
(OrderID INT IDENTITY PRIMARY KEY,
 CustomerID INT REFERENCES Customer(CustomerID),
 OrderDate DATE,
 LastModified datetime);
```

```
CREATE TABLE SaleOrderDetail
(OrderID INT REFERENCES SaleOrder(OrderID),
 ProductID INT,
 Quantity INT,
 UnitPrice INT,
 PRIMARY KEY (OrderID, ProductID));

/* Write a trigger to put the change date and time in the LastModified column
   of the Order table whenever an order item in SaleOrderDetail is changed. */
```

Lab 5-4

```
/* In an investment company, bonuses are handed out to the top-performing
   employees every quarter. There is a business rule that no employee can
   be granted more than a total of $100,000 as bonuses per year. Any attempt
   to give an employee more than $100,000 for bonuses in a year must be logged
   in an audit table and the violating bonus is not allowed.

   Given the following 3 tables, please write a trigger to implement
   the business rule. The rule must be enforced every year automatically.
   Assume only one bonus is entered in the database at a time.
   You can just consider the INSERT scenarios.
*/

create table Employee
(EmployeeID int primary key,
 EmpLastName varchar(50),
 EmpFirstName varchar(50),
 DepartmentID smallint);

create table Bonus
(BonusID int identity primary key,
 BonusAmount int,
 BonusDate date NOT NULL,
 EmployeeID int NOT NULL);

create table BonusAudit  -- Audit Table
(AuditID int identity primary key,
 EnteredBy varchar(50) default original_login(),
 EnterTime datetime default getdate(),
 EnteredAmount int not null);
```

Useful Links

Create a Stored Procedure

http://msdn.microsoft.com/en-us/library/ms345415.aspx

Create a Function

http://msdn.microsoft.com/en-us/library/ms186755.aspx

Use TRY and CATCH for Error Handling

http://msdn.microsoft.com/en-us/library/ms175976.aspx

XACT_STATE

http://msdn.microsoft.com/en-us/library/ms189797.aspx

DATEADD

http://msdn.microsoft.com/en-us/library/ms186819.aspx

DATEPART

https://docs.microsoft.com/en-us/sql/t-sql/functions/datepart-transact-sql

CROSS APPLY vs INNER JOIN

https://stackoverflow.com/questions/1139160/when-should-i-use-cross-apply-over-inner-join