Build Dynamic SQL in a Stored Procedure - Essential SQL

After reading this article you will understand the basics of dynamic SQL; how to build statements based on variable values, and how to execute those constructed statements using sp_executesql and EXECUTE() from within a stored procedure.

All the examples for this lesson are based on Microsoft SQL Server Management Studio and the sample databases AdventureWorks and WideWorldImporters. You can get started using these free tools with my Guide *Getting Started Using SQL Server*.

Most SQL we write is written directly into the stored procedure. It is what is called **static SQL**. It is called this because it doesn't change. Once it is written, it's meaning is set, it's hammered into stone.

Below is an example of static SQL:

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SELECT    JobTitle, Count(BusinessEntityID)
FROM      HumanResources.Employee
WHERE     Year(BirthDate) = 1970
GROUP BY  JobTitle

SELECT    JobTitle, Count(BusinessEntityID)
FROM      HumanResources.Employee
WHERE     Year(BirthDate) = 1971
GROUP BY JobTitle
```

Notice there are two statements, each returning a summary of JobTitles for a specific employee birth year. If we want to add more birth years, we need to add more statements. What if we only had to write the statement once and be able to change the year on-the-fly?

The code in these variables is then executed. Continuing with our example, here is the same code using dynamic SQL:

```
DECLARE @birthYear int = 1970
DECLARE @statement NVARCHAR(4000)

WHILE @birthYear <= 1971
BEGIN
   SET @statement = '
```

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Of course, you could write this as two separate queries as shown in the following stored proc but that wouldn't be much fun, as it would be too much typing and prone to errors!

```
CREATE PROCEDURE uspCalcuateSalesSummaryStatic
@returnAverage bit
AS
```

```
IF (@returnAverage = 1)
BEGIN
   SELECT   SOD.ProductID,
            AVG(SOD.LineTotal) as ResultAvg
   FROM     Sales.SalesOrderDetail SOD
            INNER JOIN Sales.SalesOrderHEader SOH
                     ON SOH.SalesOrderID = SOD.SalesOrderID
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You can see where the SQL is then built to create statement. Notice the color coding. It should correspond similar portions within the static version; this should help you do a comparison.

Debugging Dynamic SQL

You may be wonder what the SQL looks like at run time. You can easily inspect the code using the debugger:

Run the stored procedure using the debugger's run command, and then Step Into the code

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type are separated by a space. Multiple parameters are separated by a comma.

Next we set the parameter values, by specifying the parameters and desired value. The parameters are listed in order defined within the @parameterDefinition string.

- @parm1 is the first parameter defined within the @parameterDefinition string. Value is the value, you wish to set it to.
- @parm2, is the second parameters, if defines, as declared in @parameterDefinition.
- and so on...

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IF (@returnAverage = 1) SET @function = 'Avg'
ELSE SET @function = 'Sum'

SET @parameterDefinition = '@shipDateYear int'
SET @statement =
```

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'SELECT   SOD.ProductID,' +
          @function +  + '(SOD.LineTotal) as Result' + @function + '
 FROM     Sales.SalesOrderDetail SOD
          INNER JOIN Sales.SalesOrderHEader SOH
                    ON SOH.SalesOrderID = SOD.SalesOrderID
 WHERE    YEAR(SOH.ShipDate) = @shipDateYear
 GROUP BY SOD.ProductID'
```

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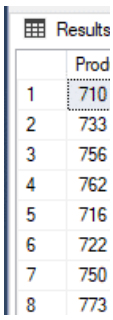

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```
GROUP BY SOD.ProductID'

EXECUTE sp_executesql @statement, @parameterDefinition, @shipDate
```

Notice that the EXECUTE statement is much simpler, there is no need to assign the SQL statement parameter @shipDateYear to the store procedure parameter @shipDate's value.

This makes the statement more compact and easier to read. The flow seems to read better, as you don't have to mentally make connections between the stored procedure parameters and SQL parameters

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- Parameterized queries are less prone to SQL injection attacks.

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Kris Wenzel

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