Stored Procedure Lab Manual + Northwind

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SQL stored procedure

A SQL stored procedure (SP) is a collection of SQL statements and SQL command logic, which is compiled and stored on the database. Stored procedures in SQL allow us to create SQL queries to be stored and executed on the server. Stored procedures can also be cached and reused. The main purpose of stored procedures is to hide direct SQL queries from the code and improve performance of database operations such as select, update, and delete data.

• Types of stored procedures

There are two types of stored procedures available in SQL Server:

I. User defined stored procedures.
II. System stored procedures.

User defined stored procedures.

User defined stored procedures are created by database developers or database administrators. These SPs contains one more SQL statements to select, update, or delete records from database tables. User defined stored procedure can take input parameters and return output parameters. User defined stored procedure is mixture of DDL (Data Definition Language) and DML (Data Manipulation Language) commands. User defined SPs are further classified into two types:

T-SQL stored procedures: T-SQL (Transact SQL) SPs receive and return parameters. These SPs process the Insert, Update and Delete queries with or without parameters and return data of rows as output. This is one of the most common ways to write SPs in SQL Server.

CLR stored procedures: CLR (Common Language Runtime) SPs are written in a CLR based programming language such as C# or VB.NET and are executed by the .NET Framework.

System stored procedures.

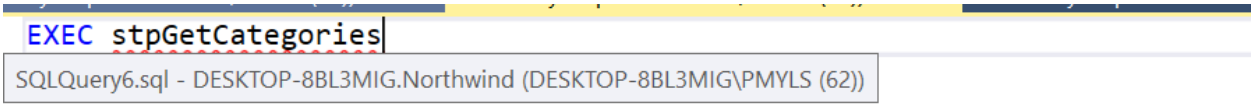
System stored procedures are created and executed by SQL Server for the server administrative activities. Developers usually don't interfere with system SPs.

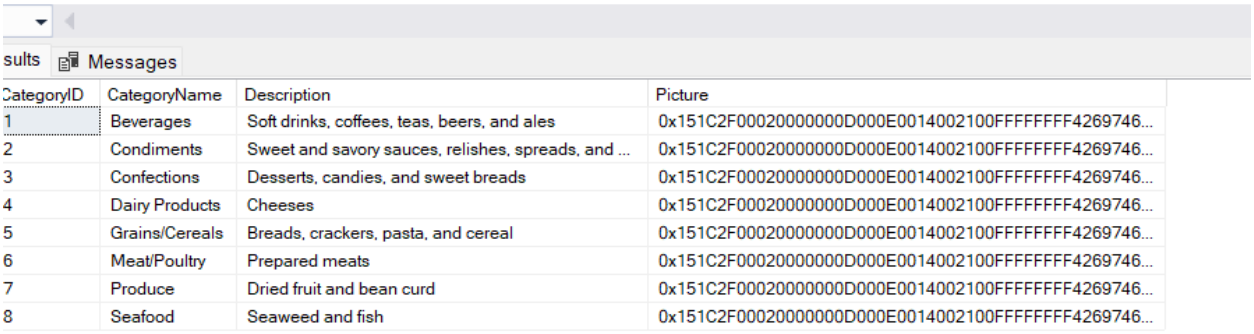
My database name is Northwind.

How to create a SELECT stored procedure?

```
SET ANSI_NULLS ON
GO
SET QUOTED_IDENTIFIER ON
GO
-- =============================================
-- Author: Saad Ahmad
-- Create date: 23 Mar 2024
-- Description: Return all members
-- =============================================
--Store procedure name is --> stpGetCategories
CREATE PROCEDURE stpGetCategories
AS
BEGIN
-- SET NOCOUNT ON added to prevent extra result sets from
-- interfering with SELECT statements.
SET NOCOUNT ON;
-- Select statements for procedure here
Select * from Categories
END
GO
```

Output:





CategoryID	CategoryName	Description	Picture
1	Beverages	Soft drinks, coffees, teas, beers, and ales	0x151C2F00020000000D000E0014002100FFFFFFFF4269746...
2	Condiments	Sweet and savory sauces, relishes, spreads, and ...	0x151C2F00020000000D000E0014002100FFFFFFFF4269746...
3	Confections	Desserts, candies, and sweet breads	0x151C2F00020000000D000E0014002100FFFFFFFF4269746...
4	Dairy Products	Cheeses	0x151C2F00020000000D000E0014002100FFFFFFFF4269746...
5	Grains/Cereals	Breads, crackers, pasta, and cereal	0x151C2F00020000000D000E0014002100FFFFFFFF4269746...
6	Meat/Poultry	Prepared meats	0x151C2F00020000000D000E0014002100FFFFFFFF4269746...
7	Produce	Dried fruit and bean curd	0x151C2F00020000000D000E0014002100FFFFFFFF4269746...
8	Seafood	Seaweed and fish	0x151C2F00020000000D000E0014002100FFFFFFFF4269746...

What are parameters in stored procedures?

Parameters in SPs are used to pass input values and return output values. There are two types of parameters:

1. Input parameters - Pass values to a stored procedure.

2. Output parameters - Return values from a stored procedure.

Here is the updated SP with a parameter @CategoryName.

```
SET ANSI_NULLS ON
GO
SET QUOTED_IDENTIFIER ON
GO
-- =============================================
-- Author: Saad Ahmad
-- Create date: 25 March 2024
-- Description:  Return specifc CategoryName records
-- =============================================
--Store procedure name is --> stpGetAllMembers
CREATE PROCEDURE stpGetCategoriesByName
-- Add the parameters for the stored procedure here
@CategoryName nvarchar(30)
AS
BEGIN
-- SET NOCOUNT ON added to prevent extra result sets from
-- interfering with SELECT statements.
SET NOCOUNT ON;
-- Select statements for procedure here
Select * from Categories
WHERE CategoryName like '%' + @CategoryName + '%'
END
GO
```

Output

The code to execute looks like the following:

```
USE [Northwind]
GO

DECLARE    @return_value int

EXEC  @return_value = [dbo].[stpGetCategoriesByName]
          @CategoryName = N'Beverages'

SELECT     'Return Value' = @return_value

GO
```

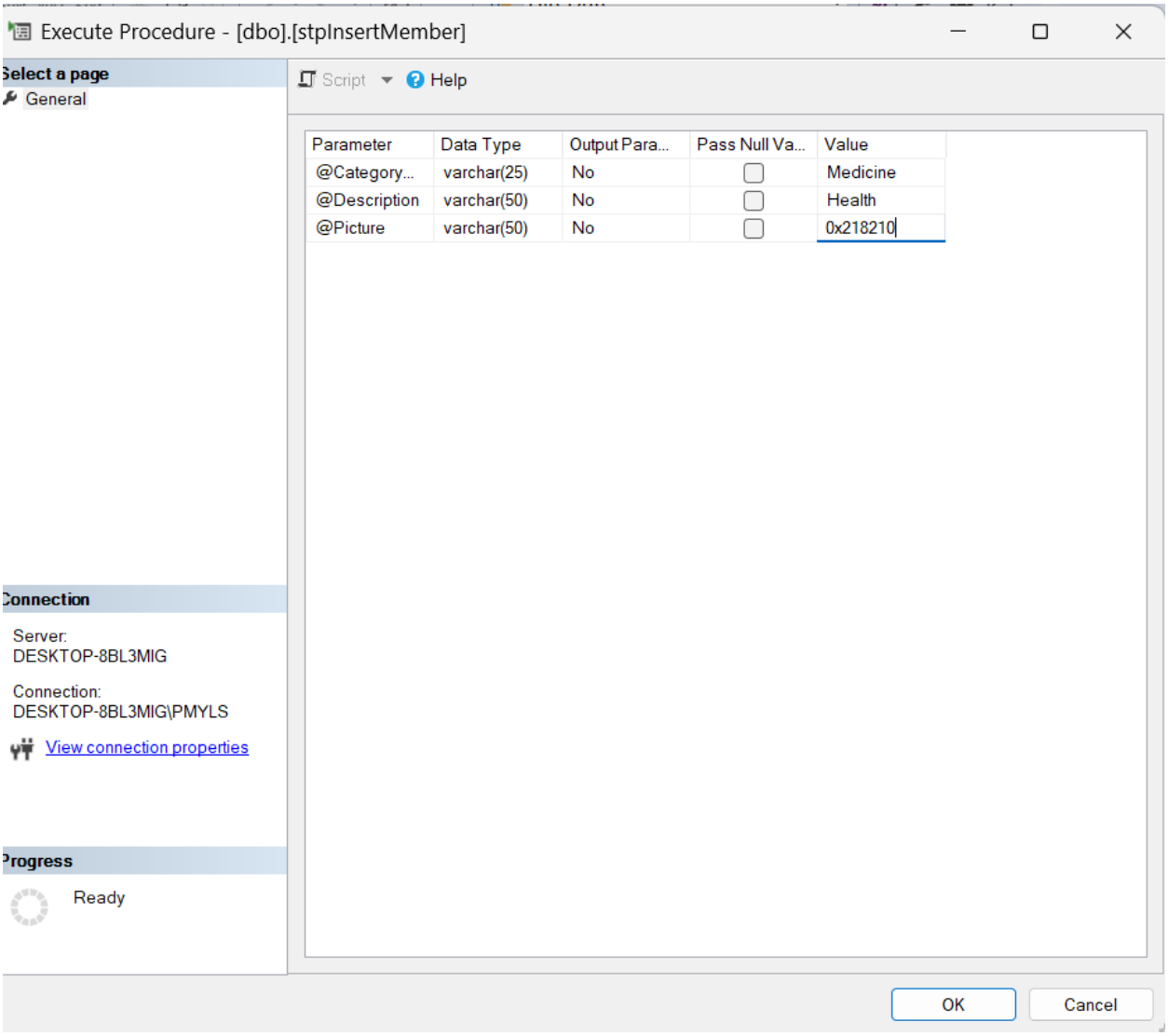
How to create a INSERT query based stored procedure?

We can use an INSERT INTO SQL query to insert data into a table. The following SQL statement creates an INSERT SP with three parameters.

```
SET ANSI_NULLS ON
GO
SET QUOTED_IDENTIFIER ON
GO
-- =============================================
-- Author: Saad Ahmad
-- Create date: 25 March 2024
-- Description:  Insertiing Records
-- =============================================
--Store procedure name is --> stpGetAllMembers
CREATE PROCEDURE stpInsertMember
@CategoryId varchar(50),
@CategoryName varchar(25),
@Description varchar(50),
@Picture varchar(50)

AS
BEGIN
-- SET NOCOUNT ON added to prevent extra result sets from
-- interfering with SELECT statements.
SET NOCOUNT ON;

Insert into Categories(CategoryId,CategoryName,Description,Picture)
Values (@CategoryId,@CategoryName,@Description, @Picture)

END
GO
```

Execution:

```
USE [Northwind]
GO

DECLARE    @return_value int

EXEC  @return_value = [dbo].[stpInsertMember]
           @CategoryName = N'Medicine',
           @Description = N'Health',
           @Picture = N'0xwq'

SELECT     'Return Value' = @return_value GO
```



Output

	CategoryID	CategoryName	Description	Picture
1	1	Beverages	Soft drinks, coffees, teas, beers, and ales	0x151C2F00020000000D000E0014002100FFFFFFFF4269746...
2	2	Condiments	Sweet and savory sauces, relishes, spreads, and ...	0x151C2F00020000000D000E0014002100FFFFFFFF4269746...
3	3	Confections	Desserts, candies, and sweet breads	0x151C2F00020000000D000E0014002100FFFFFFFF4269746...
4	4	Dairy Products	Cheeses	0x151C2F00020000000D000E0014002100FFFFFFFF4269746...
5	5	Grains/Cereals	Breads, crackers, pasta, and cereal	0x151C2F00020000000D000E0014002100FFFFFFFF4269746...
6	6	Meat/Poultry	Prepared meats	0x151C2F00020000000D000E0014002100FFFFFFFF4269746...
7	7	Produce	Dried fruit and bean curd	0x151C2F00020000000D000E0014002100FFFFFFFF4269746...
8	8	Seafood	Seaweed and fish	0x151C2F00020000000D000E0014002100FFFFFFFF4269746...
9	9	Medicine	Health	0x30787771

The 9th record is the newly added record.

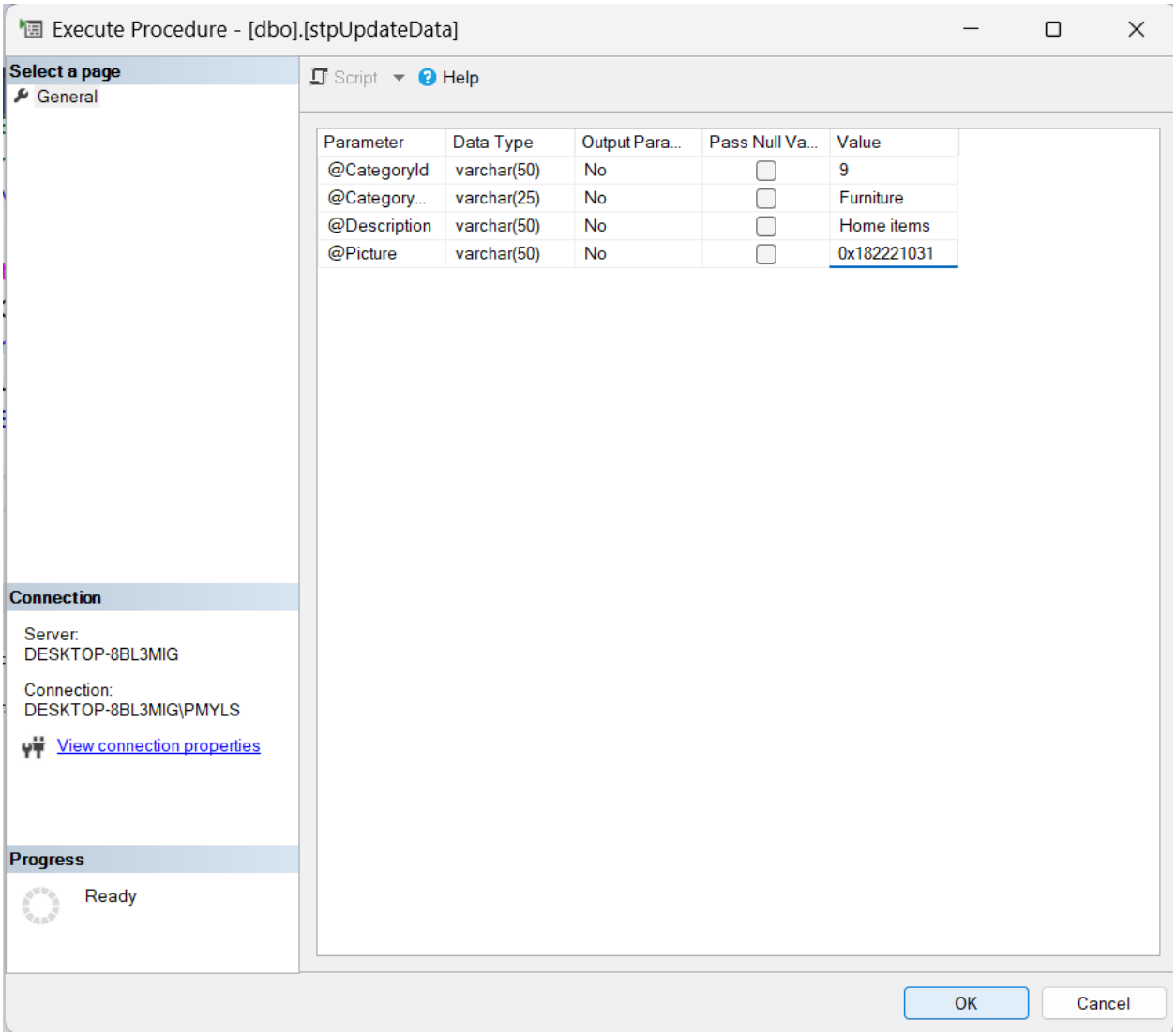
How to create an UPDATE quert based stored procedure?

```
SET ANSI_NULLS ON
GO
SET QUOTED_IDENTIFIER ON
GO
-- =============================================
-- Author: Saad Ahmad
-- Create date: 25 March 2024
-- Description:  Updating Records
-- =============================================
--Store procedure name is --> stpUpdateData
CREATE PROCEDURE stpUpdateData
@CategoryId varchar(50),
@CategoryName varchar(25),
@Description varchar(50),
@Picture varchar(50)

AS
BEGIN
-- SET NOCOUNT ON added to prevent extra result sets from
-- interfering with SELECT statements.
SET NOCOUNT ON;

Update  Categories
SET CategoryName = @CategoryName,
Description = @Description,
Picture = @Picture
WHERE CategoryId = @CategoryId

END
GO
```

To Execute

```
USE [Northwind]
GO

DECLARE     @return_value int

EXEC  @return_value = [dbo].[stpUpdateData]
            @CategoryId = N'9',
            @CategoryName = N'Furniture',
            @Description = N'Home items',
            @Picture = N'0x182221031'

SELECT      'Return Value' = @return_value

GO
```

Execution:



Output

	CategoryID	CategoryName	Description	Picture
1	1	Beverages	Soft drinks, coffees, teas, beers, and ales	0x151C2F00020000000D000E0014002100FFFFFFFF4269746...
2	2	Condiments	Sweet and savory sauces, relishes, spreads, and ...	0x151C2F00020000000D000E0014002100FFFFFFFF4269746...
3	3	Confections	Desserts, candies, and sweet breads	0x151C2F00020000000D000E0014002100FFFFFFFF4269746...
4	4	Dairy Products	Cheeses	0x151C2F00020000000D000E0014002100FFFFFFFF4269746...
5	5	Grains/Cereals	Breads, crackers, pasta, and cereal	0x151C2F00020000000D000E0014002100FFFFFFFF4269746...
6	6	Meat/Poultry	Prepared meats	0x151C2F00020000000D000E0014002100FFFFFFFF4269746...
7	7	Produce	Dried fruit and bean curd	0x151C2F00020000000D000E0014002100FFFFFFFF4269746...
8	8	Seafood	Seaweed and fish	0x151C2F00020000000D000E0014002100FFFFFFFF4269746...
9	9	Furniture	Home items	0x3078313832323231303331

Id 9 is updated

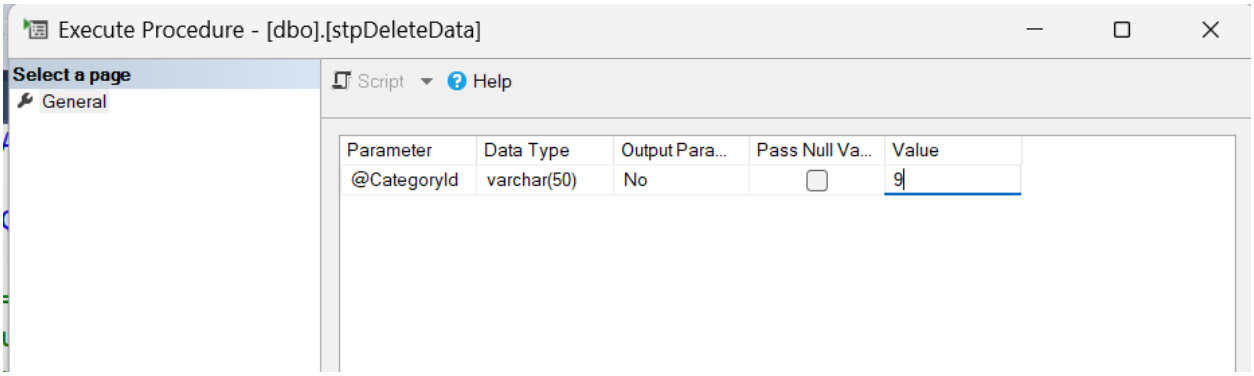
How to create a DELETE query based stored procedure?

```
SET ANSI_NULLS ON
GO
SET QUOTED_IDENTIFIER ON
GO
-- =============================================
-- Author: Saad Ahmad
-- Create date: 25 March 2024
-- Description:  Deleting Records
-- =============================================
--Store procedure name is --> stpDeleteData
CREATE PROCEDURE stpDeleteData
@CategoryId varchar(50)

AS
BEGIN
-- SET NOCOUNT ON added to prevent extra result sets from
-- interfering with SELECT statements.
SET NOCOUNT ON;

DELETE FROM Categories
WHERE CategoryId = @CategoryId

END
GO
```

To Execute

```
USE [Northwind]
GO

DECLARE     @return_value int

EXEC  @return_value = [dbo].[stpDeleteData]
            @CategoryId = N'9'

SELECT      'Return Value' = @return_value

GO
```

Execution



Output

	CategoryID	CategoryName	Description	Picture
1	1	Beverages	Soft drinks, coffees, teas, beers, and ales	0x151C2F00020000000D000E0014002100FFFFFFFF4269746...
2	2	Condiments	Sweet and savory sauces, relishes, spreads, and ...	0x151C2F00020000000D000E0014002100FFFFFFFF4269746...
3	3	Confections	Desserts, candies, and sweet breads	0x151C2F00020000000D000E0014002100FFFFFFFF4269746...
4	4	Dairy Products	Cheeses	0x151C2F00020000000D000E0014002100FFFFFFFF4269746...
5	5	Grains/Cereals	Breads, crackers, pasta, and cereal	0x151C2F00020000000D000E0014002100FFFFFFFF4269746...
6	6	Meat/Poultry	Prepared meats	0x151C2F00020000000D000E0014002100FFFFFFFF4269746...
7	7	Produce	Dried fruit and bean curd	0x151C2F00020000000D000E0014002100FFFFFFFF4269746...
8	8	Seafood	Seaweed and fish	0x151C2F00020000000D000E0014002100FFFFFFFF4269746...

Id 9 has been Deleted