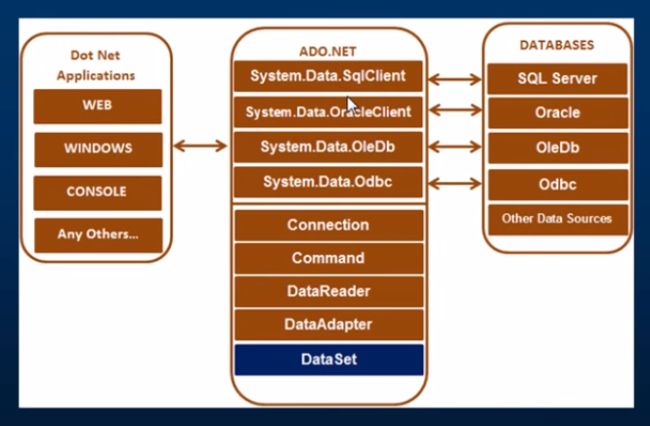
ADO.NET Introduction  
  
ADO.NET is a set of classes (a framework) to interact with data sources such as databases and XML files. ADO is the acronym for ActiveX Data Objects. It allows us to connect to underlying data or databases. It has classes and methods to retrieve and manipulate data.  
  
Various Connection Architectures  
  
There are the following two types of connection architectures:

**Connected architecture:** the application remains connected with the database throughout the processing.  
**Disconnected architecture:** the application automatically connects/disconnects during the processing. The application uses temporary data on the application side called a DataSet.

Understanding ADO.NET and its class library  
 ****

Important Classes in ADO.NET

* Connection Class
* Command Class
* DataReader Class
* DataAdaptor Class
* DataSet.Class

**1. Connection Class**In ADO.NET, we use these connection classes to connect to the database. These connection classes also manage transactions and connection pooling.  
**2. Command Class**  
The Command class provides methods for storing and executing SQL statements and Stored Procedures. The following are the various commands that are executed by the Command Class.

* **ExecuteReader:** Returns data to the client as rows. This would typically be an SQL select statement or a Stored Procedure that contains one or more select statements. This method returns a DataReader object that can be used to fill a DataTable object or used directly for printing reports and so forth.
* **ExecuteNonQuery:** Executes a command that changes the data in the database, such as an update, delete, or insert statement, or a Stored Procedure that contains one or more of these statements. This method returns an integer that is the number of rows affected by the query.
* **ExecuteScalar:**This method only returns a single value. This kind of query returns a count of rows or a calculated value.
* **ExecuteXMLReader:** (SqlClient classes only) Obtains data from an SQL Server 2000 database using an XML stream. Returns an XML Reader object.

**3. DataReader Class**  
The DataReader is used to retrieve data. It is used in conjunction with the Command class to execute an SQL Select statement and then access the returned rows.  
**4. DataAdapter Class**  
The DataAdapter is used to connect DataSets to databases. The DataAdapter is most useful when using data-bound controls in Windows Forms, but it can also be used to provide an easy way to manage the connection between your application and the underlying database tables, views and Stored Procedures.  
**5. DataSet Class**

The DataSet is the heart of ADO.NET. The DataSet is essentially a collection of DataTable objects. In turn each object contains a collection of DataColumn and DataRow objects. The DataSet also contains a Relations collection that can be used to define relations among Data Table Objects.

using **System**;

using **System**.**Data**.**SqlClient**;

namespace **FirstProgram**

{

class **Program**

{

static void **Main**(string[] args)

{

string **ConString** = @"Data Source=.\SQLEXPRESS;Initial Catalog=TestDB;Integrated Security=True";

**SqlConnection** con = new **SqlConnection**(**ConString**);

string querystring = "Select \* from Student";

con.**Open**();

**SqlCommand** cmd = new **SqlCommand**(querystring, con);

**SqlDataReader** reader = cmd.**ExecuteReader**();

while (reader.**Read**())

{

**Console**.**WriteLine**(reader[0].**ToString**() + " " + reader[1].**ToString**() + " " + reader[2].**ToString**());

}

}

}

}

# CONNECT TO DATASOURCE

There are 5 steps to connecting database.

1. Add Namespace: **using System.Data.SqlClient**;  
2. Create Connection Object and Pass Connection String as Parameter.  
3. Open Connection  
4. Execute SQL Query  
5. Close the Connection.

**SqlConnection** con = new **SqlConnection**("Data Source=.\SQLEXPRESS;Initial Catalog=TestDB;User ID=sa;Password=System123;Pooling=False"; );

con.**Open**();

// Update, Insert Delete Job in Table

con.**Close**();

# C# ADO.NET - Create, Select, Rename and Delete Database

## CREATE A DATABASE USING ADO.NET C#

using **System**;

using **System**.**Data**.**SqlClient**;

namespace **CreateDatabase**

{

class **Program**

{

static void **Main**(string[] args)

{

**SqlConnection** con = new **SqlConnection**(@"Data Source=.\SQLEXPRESS;Initial Catalog=master;Integrated Security=True");

string query = "Create Database ComputerShop";

**SqlCommand** cmd = new **SqlCommand**(query, con);

try

{

con.**Open**();

cmd.**ExecuteNonQuery**();

**Console**.**WriteLine**("Database Created Successfully");

}

catch(**SqlException** e)

{

**Console**.**WriteLine**("Error Generated. Details: " + e.**ToString**());

}

finally

{

con.**Close**();

**Console**.**ReadKey**();

}

}

}

}

# RENAME A DATABASE USING ADO.NET C#

using **System**;

using **System**.**Data**.**SqlClient**;

namespace **RenameDatabase**

{

class **Program**

{

static void **Main**(string[] args)

{

**SqlConnection** con = new **SqlConnection**(@"Data Source=.\SQLEXPRESS;Initial Catalog=master;Integrated Security=True");

string query = "ALTER DATABASE ComputerShop MODIFY NAME = MobileShop";

**SqlCommand** cmd = new **SqlCommand**(query, con);

try

{

con.**Open**();

cmd.**ExecuteNonQuery**();

**Console**.**WriteLine**("Database Renamed Successfully");

}

catch(**SqlException** e)

{

**Console**.**WriteLine**("Error Generated. Details: " + e.**ToString**());

}

finally

{

con.**Close**();

**Console**.**ReadKey**();

}

}

}

}

## SELECT A DATABASE USING ADO.NET C#

**SqlConnection** con = new **SqlConnection**(@"Data Source=.\SQLEXPRESS;Initial Catalog=MobileShop;Integrated Security=True");

## DROP OR DELETE A DATABASE USING ADO.NET C#

using **System**;

using **System**.**Data**.**SqlClient**;

namespace **DeleteDatabase**

{

class **Program**

{

static void **Main**(string[] args)

{

**SqlConnection** con = new **SqlConnection**(@"Data Source=.\SQLEXPRESS;Initial Catalog=master;Integrated Security=True");

string query = "DROP DATABASE ComputerShop";

**SqlCommand** cmd = new **SqlCommand**(query, con);

try

{

con.**Open**();

cmd.**ExecuteNonQuery**();

**Console**.**WriteLine**("Database Deleted Successfully");

}

catch(**SqlException** e)

{

**Console**.**WriteLine**("Error Generated. Details: " + e.**ToString**());

}

finally

{

con.**Close**();

**Console**.**ReadKey**();

}

}

}

}

# C# ADO.NET - Create, Rename, Alter And Delete Table

## CREATE A TABLE USING C# ADO.NET

using **System**;

using **System**.**Data**.**SqlClient**;

namespace **CreateTable**

{

class **Program**

{

static void **Main**(string[] args)

{

**SqlConnection** con = new **SqlConnection**(@"Data Source=.\SQLEXPRESS;Initial Catalog=ComputerShop;Integrated Security=True");

string query =

@"CREATE TABLE dbo.Products

(

ID int IDENTITY(1,1) NOT NULL,

Name nvarchar(50) NULL,

Price nvarchar(50) NULL,

Date datetime NULL,

CONSTRAINT pk\_id PRIMARY KEY (ID)

);";

**SqlCommand** cmd = new **SqlCommand**(query, con);

try

{

con.**Open**();

cmd.**ExecuteNonQuery**();

**Console**.**WriteLine**("Table Created Successfully");

}

catch(**SqlException** e)

{

**Console**.**WriteLine**("Error Generated. Details: " + e.**ToString**());

}

finally

{

con.**Close**();

**Console**.**ReadKey**();

}

}

}

}

## RENAME A TABLE USING C# ADO.NET

using **System**;

using **System**.**Data**.**SqlClient**;

namespace **RenameTable**

{

class **Program**

{

static void **Main**(string[] args)

{

**SqlConnection** con = new **SqlConnection**(@"Data Source=.\SQLEXPRESS;Initial Catalog=ComputerShop;Integrated Security=True");

string query = @"EXEC sp\_rename 'Products', 'Accessories'";

**SqlCommand** cmd = new **SqlCommand**(query, con);

try

{

con.**Open**();

cmd.**ExecuteNonQuery**();

**Console**.**WriteLine**("Table Renamed Successfully");

}

catch(**SqlException** e)

{

**Console**.**WriteLine**("Error Generated. Details: " + e.**ToString**());

}

finally

{

con.**Close**();

**Console**.**ReadKey**();

}

}

}

}

## ALTER TABLE USING ADO.NET C#

using **System**;

using **System**.**Data**.**SqlClient**;

namespace **CreateColumn**

{

class **Program**

{

static void **Main**(string[] args)

{

**SqlConnection** con = new **SqlConnection**(@"Data Source=.\SQLEXPRESS;Initial Catalog=ComputerShop;Integrated Security=True");

string query =

@"ALTER TABLE Accessories

ADD Stock nvarchar(50);";

**SqlCommand** cmd = new **SqlCommand**(query, con);

try

{

con.**Open**();

cmd.**ExecuteNonQuery**();

**Console**.**WriteLine**("Column Created Successfully");

}

catch(**SqlException** e)

{

**Console**.**WriteLine**("Error Generated. Details: " + e.**ToString**());

}

finally

{

con.**Close**();

**Console**.**ReadKey**();

}

}

}

}

## ****Drop or Delete a Column****

using **System**;

using **System**.**Data**.**SqlClient**;

namespace **DeleteColumn**

{

class **Program**

{

static void **Main**(string[] args)

{

**SqlConnection** con = new **SqlConnection**(@"Data Source=.\SQLEXPRESS;Initial Catalog=ComputerShop;Integrated Security=True");

string query =

@"ALTER TABLE Accessories

DROP COLUMN Stock;";

**SqlCommand** cmd = new **SqlCommand**(query, con);

try

{

con.**Open**();

cmd.**ExecuteNonQuery**();

**Console**.**WriteLine**("Column Deleted Successfully");

}

catch(**SqlException** e)

{

**Console**.**WriteLine**("Error Generated. Details: " + e.**ToString**());

}

finally

{

con.**Close**();

**Console**.**ReadKey**();

}

}

}

}

## DELETING A SQL TABLE USING C# ADO.NET

using **System**;

using **System**.**Data**.**SqlClient**;

namespace **DropTable**

{

class **Program**

{

static void **Main**(string[] args)

{

**SqlConnection** con = new **SqlConnection**(@"Data Source=.\SQLEXPRESS;Initial Catalog=ComputerShop;Integrated Security=True");

string query =

@"DROP TABLE Accessories";

**SqlCommand** cmd = new **SqlCommand**(query, con);

try

{

con.**Open**();

cmd.**ExecuteNonQuery**();

**Console**.**WriteLine**("Table Deleted Successfully");

}

catch (**SqlException** e)

{

**Console**.**WriteLine**("Error Generated. Details: " + e.**ToString**());

}

finally

{

con.**Close**();

**Console**.**ReadKey**();

}

}

}

}

.

# Insert Records Using Simple and Parameterized Query – C# SQL

## INSERT ROW IN TABLE

The keyword INSERT INTO is used for inserting records in a table. There are 2 ways to insert records in a table.

* Insert using Simple Query
* Insert using Parameterized Query

## Direct Insert Record in a Table

using **System**;

using **System**.**Data**.**SqlClient**;

namespace **InsertRecords**

{

class **Program**

{

static void **Main**(string[] args)

{

**SqlConnection** con = new **SqlConnection**(@"Data Source=.\SQLEXPRESS;Initial Catalog=ComputerShop;Integrated Security=True");

string query = "INSERT INTO Products (Name,Price,Date) VALUES('LED Screen','$120','27 January 2017')";

**SqlCommand** cmd = new **SqlCommand**(query, con);

try

{

con.**Open**();

cmd.**ExecuteNonQuery**();

**Console**.**WriteLine**("Records Inserted Successfully");

}

catch (**SqlException** e)

{

**Console**.**WriteLine**("Error Generated. Details: " + e.**ToString**());

}

finally

{

con.**Close**();

**Console**.**ReadKey**();

}

}

}

}

## PARAMETERIZED QUERY

using **System**;

using **System**.**Data**.**SqlClient**;

namespace **InsertRecords**

{

class **Program**

{

static void **Main**(string[] args)

{

**SqlConnection** con = new **SqlConnection**(@"Data Source=.\SQLEXPRESS;Initial Catalog=ComputerShop;Integrated Security=True");

//Replaced Parameters with Value

string query = "INSERT INTO Products (Name, Price, Date) VALUES(@Name, @Price, @Date)";

**SqlCommand** cmd = new **SqlCommand**(query, con);

//Pass values to Parameters

cmd.**Parameters**.**AddWithValue**("@Name", "USB Keyboard");

cmd.**Parameters**.**AddWithValue**("@Price", "$20");

cmd.**Parameters**.**AddWithValue**("@Date", "25 May 2017");

try

{

con.**Open**();

cmd.**ExecuteNonQuery**();

**Console**.**WriteLine**("Records Inserted Successfully");

}

catch (**SqlException** e)

{

**Console**.**WriteLine**("Error Generated. Details: " + e.**ToString**());

}

finally

{

con.**Close**();

**Console**.**ReadKey**();

}

}

}

}

## COPY ONE TABLE TO ANOTHER TABLE

using **System**;

using **System**.**Data**.**SqlClient**;

namespace **InsertRecords**

{

class **Program**

{

static void **Main**(string[] args)

{

**SqlConnection** con = new **SqlConnection**(@"Data Source=.\SQLEXPRESS;Initial Catalog=ComputerShop;Integrated Security=True");

//Replaced Parameters with Value

string query = "INSERT INTO Items(Name,Price,Date) SELECT Name,Price,Date FROM Products";

**SqlCommand** cmd = new **SqlCommand**(query, con);

try

{

con.**Open**();

cmd.**ExecuteNonQuery**();

**Console**.**WriteLine**("Records Inserted Successfully");

}

catch (**SqlException** e)

{

**Console**.**WriteLine**("Error Generated. Details: " + e.**ToString**());

}

finally

{

con.**Close**();

**Console**.**ReadKey**();

}

}

}

}

# Create and Execute Store Procedure Using C# ADO.Net

## CREATE STORE PROCEDURE USING C# ADO.NET

using **System**;

using **System**.**Data**.**SqlClient**;

namespace **Create\_Store\_Procedure**

{

class **Program**

{

static void **Main**(string[] args)

{

**SqlConnection** con = new **SqlConnection**(@"Data Source=.\SQLEXPRESS;Initial Catalog=ComputerShop;Integrated Security=True");

string query =

@"

CREATE PROCEDURE Insert\_Record\_Procedure

(

@Name VARCHAR(50),

@Price VARCHAR(50),

@Date DATETIME

)

AS

INSERT INTO Products(Name,Price,Date) Values(@Name,@Price,@Date)

";

**SqlCommand** cmd = new **SqlCommand**(query, con);

try

{

con.**Open**();

cmd.**ExecuteNonQuery**();

**Console**.**WriteLine**("Store Procedure Created Successfully");

}

catch (**SqlException** e)

{

**Console**.**WriteLine**("Error Generated. Details: " + e.**ToString**());

}

finally

{

con.**Close**();

**Console**.**ReadKey**();

}

}

}

}

## LIST ALL THE CREATED STORE PROCEDURE

using **System**;

using **System**.**Data**.**SqlClient**;

namespace **Create\_Store\_Procedure**

{

class **Program**

{

static void **Main**(string[] args)

{

**SqlConnection** con = new **SqlConnection**(@"Data Source=.\SQLEXPRESS;Initial Catalog=ComputerShop;Integrated Security=True");

string query =

@"select SPECIFIC\_NAME from ComputerShop.information\_schema.routines where routine\_type = 'PROCEDURE'

";

**SqlCommand** cmd = new **SqlCommand**(query, con);

try

{

con.**Open**();

**SqlDataReader** dr = cmd.**ExecuteReader**();

while (dr.**Read**())

{

**Console**.**WriteLine**(dr["SPECIFIC\_NAME"].**ToString**());

}

}

catch (**SqlException** e)

{

**Console**.**WriteLine**("Error Generated. Details: " + e.**ToString**());

}

finally

{

con.**Close**();

**Console**.**ReadKey**();

}

}

}

}

## INSERT RECORDS TO TABLE USING STORE PROCEDURE

using **System**;

using **System**.**Data**.**SqlClient**;

using **System**.**Data**;

namespace **Create\_Store\_Procedure**

{

class **Program**

{

static void **Main**(string[] args)

{

**SqlConnection** con = new **SqlConnection**(@"Data Source=.\SQLEXPRESS;Initial Catalog=ComputerShop;Integrated Security=True");

**SqlCommand** cmd = new **SqlCommand**("Insert\_Record\_Procedure", con);

try

{

con.**Open**();

cmd.**CommandType** = **CommandType**.**StoredProcedure**;

cmd.**Parameters**.**Add**(new **SqlParameter**("@Name", "SSD DRIVE"));

cmd.**Parameters**.**Add**(new **SqlParameter**("@Price", "$300"));

cmd.**Parameters**.**Add**(new **SqlParameter**("@Date" , "25 August 14"));

int i = cmd.**ExecuteNonQuery**();

if(i>0)

{

**Console**.**WriteLine**("Records Inserted Successfully.");

}

}

catch (**SqlException** e)

{

**Console**.**WriteLine**("Error Generated. Details: " + e.**ToString**());

}

finally

{

con.**Close**();

**Console**.**ReadKey**();

}

}

}

}

## RETRIEVE RECORDS USING STORE PROCEDURE C#

using **System**;

using **System**.**Data**.**SqlClient**;

using **System**.**Data**;

namespace **Create\_Store\_Procedure**

{

class **Program**

{

static void **Main**(string[] args)

{

**SqlConnection** con = new **SqlConnection**(@"Data Source=.\SQLEXPRESS;Initial Catalog=ComputerShop;Integrated Security=True");

try

{

con.**Open**();

**SqlCommand** cmd = new **SqlCommand**("Retrieve\_Record\_Proc", con);

cmd.**CommandType** = **CommandType**.**StoredProcedure**;

cmd.**Parameters**.**Add**(new **SqlParameter**("@Name", "HardDisk"));

**SqlDataReader** dr = cmd.**ExecuteReader**();

while(dr.**Read**())

{

**Console**.**WriteLine**("Product Name : " + dr[1].**ToString**());

**Console**.**WriteLine**("Price : " + dr[2].**ToString**());

**Console**.**WriteLine**("Date : " + dr[3].**ToString**());

}

}

catch (**SqlException** e)

{

**Console**.**WriteLine**("Error Generated. Details: " + e.**ToString**());

}

finally

{

con.**Close**();

**Console**.**ReadKey**();

}

}

}

}

# DataReader

## WHAT IS DATAREADERS?

The **DataReader** object in C# ADO.NET allows you to retrieve data from database in read-only and forward-only mode. It means you can only read and display data but can’t update or delete data. If you want to make modification in retrieved data you need to use DataAdapter instead of DataReader.

WHY AND WHEN TO USE DATAREADER?

When you want to only display information or search result, you can use DataReader. There are various advantages of using DataReader like:

1. The retrieved data is stored in the network buffer in the client and then the client can read data using Read method. As data gets stored in the client network buffer it increases application performance significantly.

2. By default **DataReader** stores only one row at a time in memory. It reduces system overhead.

## METHODS AND PROPERTIES OF DATAREADER

Properties

* Depth Indicates the depth of nesting for row
* FieldCount Returns number of columns in a row
* IsClosed Indicates whether a data reader is closed
* Item Gets the value of a column in native format
* RecordsAffected Number of row affected after a transaction

Methods

* Close Closes a DataRaeder object.
* Read Reads next record in the data reader.
* NextResult Advances the data reader to the next result during batch transactions.
* Getxxx There are dozens of Getxxx methods. These methods read a specific data type value from a column. For example. GetChar will return a column value as a character and GetString as a string.

using **System**;

using **System**.**Data**.**SqlClient**;

namespace **DataReader\_Examples**

{

class **Program**

{

static void **Main**(string[] args)

{

string **ConString** = @"Data Source=.\SQLEXPRESS;Initial Catalog=ComputerShop;Integrated Security=True";

**SqlConnection** con = new **SqlConnection**(**ConString**);

string querystring = "Select \* from Items";

try

{

con.**Open**();

**SqlCommand** cmd = new **SqlCommand**(querystring, con);

**SqlDataReader** reader = cmd.**ExecuteReader**();

while (reader.**Read**())

{

**Console**.**WriteLine**(reader[0].**ToString**() + " " + reader[1].**ToString**() + " " + reader[2].**ToString**());

}

}

catch(**SqlException** ex)

{

**Console**.**WriteLine**(ex.**ToString**());

}

finally

{

con.**Close**();

**Console**.**ReadKey**();

}

}

}

}

# DataSet

## WHAT IS DATASET IN ADO.NET?

In a simple word, A **DataSet** is a local copy of your Database Table that gets populated in client PC. It is independent of Data Source and because it exists in the local system, it makes application fast and reliable. Accessing Remote Database each time for updating or retrieving details are time-consuming so datasets help you to keep local database tables on your PC.

A **DataSet** behaves like real Database and it represents a complete set of data that includes tables, constraints, and relationships among the tables. Using the **DataAdapters** you can fill DataSet and use this dataset for retrieving and storing information. When all the tasks get completed, update Real Database with datasets.

## WHAT IS DATAADAPTERS?

**DataAdapters** are used for controlling Datasets and it provides communication between DataSets and DataSource. DataAdapters make a connection with Data Source and then Fill Data to DataSets. It also Updates Data Source with DataSets.

## IMPORTANT DATA ADAPTERS PROPERTIES AND METHODS

Properties:

* DeleteCommand It is used for Deleting Records from DataSource
* InsertCommand It is used for adding New Record to a DataSource
* SelectCommand It is used for Selecting Records from a DataSource
* UpdateCommand It is used for Updating Records in a DataSource.
* TableMapping It is used for mapping actual database tables and datasets.

Methods:

* Fill This method Fills Records from DataAdapters to DataSets.
* Update This method update DataSource with DataSets.

using **System**;

using **System**.**Data**.**SqlClient**;

using **System**.**Data**;

namespace **DataSet\_Example**

{

class **Program**

{

static void **Main**(string[] args)

{

string **ConString** = @"Data Source=.\SQLEXPRESS;Initial Catalog=ComputerShop;Integrated Security=True";

string querystring = "Select \* from Items";

**SqlDataAdapter** adapter = new **SqlDataAdapter**(querystring, **ConString**);

**DataSet** ds = new **DataSet**();

adapter.**Fill**(ds, "Items");

**Console**.**WriteLine**(ds.**GetXml**());

**Console**.**ReadKey**();

}

}

}

## DATASET EXAMPLE WITH GRID VIEW

using **System**;

using **System**.**Data**;

using **System**.**Data**.**SqlClient**;

using **System**.**Windows**.**Forms**;

namespace **DataSet\_Exampl**

{

public partial class **Form1** : **Form**

{

public **Form1**()

{

**InitializeComponent**();

}

private void btnGetData\_Click(object sender, **EventArgs** e)

{

//Fill DataSet

string **ConString** = @"Data Source=.\SQLEXPRESS;Initial Catalog=ComputerShop;Integrated Security=True";

string **Query** = "SELECT \* FROM Items";

**SqlDataAdapter** adapter = new **SqlDataAdapter**(**Query**,**ConString**);

**DataSet** set = new **DataSet**();

adapter.**Fill**(set, "Items");

dataGridView1.**DataSource** = set.**Tables**["Items"];

}

private void btnUpdate\_Click(object sender, **EventArgs** e)

{

//Fill Dataset

string **ConString** = @"Data Source=.\SQLEXPRESS;Initial Catalog=ComputerShop;Integrated Security=True";

string **Query** = "SELECT \* FROM Items";

**SqlDataAdapter** adapter = new **SqlDataAdapter**(**Query**, **ConString**);

**DataSet** set = new **DataSet**();

adapter.**Fill**(set, "Items");

set.**Tables**["Items"].**Rows**[1]["Name"] = "Graphics Card";

dataGridView1.**DataSource** = set.**Tables**["Items"];

}

private void btnInsert\_Click(object sender, **EventArgs** e)

{

//Fill Dataset

string **ConString** = @"Data Source=.\SQLEXPRESS;Initial Catalog=ComputerShop;Integrated Security=True";

string **Query** = "SELECT \* FROM Items";

**SqlDataAdapter** adapter = new **SqlDataAdapter**(**Query**, **ConString**);

**DataSet** set = new **DataSet**();

adapter.**Fill**(set, "Items");

//Adding New Row to DataSet

**DataRow** row = set.**Tables**["Items"].**NewRow**();

row["ID"] = 3;

row["Name"] = "4GB DDR3 RAM";

row["Price"] = "$50";

row["Date"] = "26 May 2017";

set.**Tables**["Items"].**Rows**.**Add**(row);

dataGridView1.**DataSource** = set.**Tables**["Items"];

}

private void btnDelete\_Click(object sender, **EventArgs** e)

{

//Fill Dataset

string **ConString** = @"Data Source=.\SQLEXPRESS;Initial Catalog=ComputerShop;Integrated Security=True";

string **Query** = "SELECT \* FROM Items";

**SqlDataAdapter** adapter = new **SqlDataAdapter**(**Query**, **ConString**);

**DataSet** set = new **DataSet**();

adapter.**Fill**(set, "Items");

set.**Tables**["Items"].**Rows**[1].**Delete**();

dataGridView1.**DataSource** = set.**Tables**["Items"];

}

private void btnSave\_Click(object sender, **EventArgs** e)

{

//Fill Dataset

string **ConString** = @"Data Source=.\SQLEXPRESS;Initial Catalog=ComputerShop;Integrated Security=True";

string **Query** = "SELECT \* FROM Items";

**SqlDataAdapter** adapter = new **SqlDataAdapter**(**Query**, **ConString**);

**DataSet** set = new **DataSet**();

adapter.**Fill**(set, "Items");

//Adding New Row to DataSet and Update

**DataRow** row = set.**Tables**["Items"].**NewRow**();

row["Name"] = "4GB DDR3 RAM";

row["Price"] = "$50";

row["Date"] = "26 May 2017";

set.**Tables**["Items"].**Rows**.**Add**(row);

//Updating Database Table

**SqlCommandBuilder** builder = new **SqlCommandBuilder**(adapter);

adapter.**Update**(set.**Tables**["Items"]);

**MessageBox**.**Show**("DataSet Saved to Database Successfully");

}

}

}

## DATAVIEWS

using **System**;

using **System**.**Data**;

using **System**.**Windows**.**Forms**;

using **System**.**Data**.**SqlClient**;

namespace **DataView\_Example**

{

public partial class **Form1** : **Form**

{

public **Form1**()

{

**InitializeComponent**();

}

private void btnDisplay\_Click(object sender, **EventArgs** e)

{

string **ConString** = @"Data Source=.\SQLEXPRESS;Initial Catalog=ComputerShop;Integrated Security=True";

string **Query** = "SELECT \* FROM Items";

**SqlDataAdapter** adapter = new **SqlDataAdapter**(**Query**, **ConString**);

**DataSet** set = new **DataSet**();

adapter.**Fill**(set, "Items");

**DataView** dv = set.**Tables**["Items"].**DefaultView**;

dataGridView1.**DataSource** = dv;

}

private void btnSort\_Click(object sender, **EventArgs** e)

{

string **ConString** = @"Data Source=.\SQLEXPRESS;Initial Catalog=ComputerShop;Integrated Security=True";

string **Query** = "SELECT \* FROM Items";

**SqlDataAdapter** adapter = new **SqlDataAdapter**(**Query**, **ConString**);

**DataSet** set = new **DataSet**();

adapter.**Fill**(set, "Items");

**DataView** dv = set.**Tables**["Items"].**DefaultView**;

dv.**Sort** = "Name ASC";

dataGridView1.**DataSource** = dv;

}

private void btnAdd\_Click(object sender, **EventArgs** e)

{

string **ConString** = @"Data Source=.\SQLEXPRESS;Initial Catalog=ComputerShop;Integrated Security=True";

string **Query** = "SELECT \* FROM Items";

**SqlDataAdapter** adapter = new **SqlDataAdapter**(**Query**, **ConString**);

**DataSet** set = new **DataSet**();

adapter.**Fill**(set, "Items");

**DataView** dv = set.**Tables**["Items"].**DefaultView**;

dv.**AllowNew** = true;

**DataRowView** newRow = dv.**AddNew**();

newRow.**BeginEdit**();

newRow["Name"] = "Router";

newRow["Price"] = "$130";

newRow["Date"] = "26 August 2016";

newRow.**EndEdit**();

dataGridView1.**DataSource** = dv;

}

private void btnEdit\_Click(object sender, **EventArgs** e)

{

string **ConString** = @"Data Source=.\SQLEXPRESS;Initial Catalog=ComputerShop;Integrated Security=True";

string **Query** = "SELECT \* FROM Items";

**SqlDataAdapter** adapter = new **SqlDataAdapter**(**Query**, **ConString**);

**DataSet** set = new **DataSet**();

adapter.**Fill**(set, "Items");

**DataView** dv = set.**Tables**["Items"].**DefaultView**;

dv.**AllowEdit** = true;

dv[1].**BeginEdit**();

dv[1]["Name"] = "WireLess Keyboard";

dv[1]["Price"] = "$88";

dv[1].**EndEdit**();

dataGridView1.**DataSource** = dv;

}

private void btnDelete\_Click(object sender, **EventArgs** e)

{

string **ConString** = @"Data Source=.\SQLEXPRESS;Initial Catalog=ComputerShop;Integrated Security=True";

string **Query** = "SELECT \* FROM Items";

**SqlDataAdapter** adapter = new **SqlDataAdapter**(**Query**, **ConString**);

**DataSet** set = new **DataSet**();

adapter.**Fill**(set, "Items");

**DataView** dv = set.**Tables**["Items"].**DefaultView**;

dv.**AllowDelete** = true;

dv.**Table**.**Rows**[2].**Delete**();

dataGridView1.**DataSource** = dv;

}

}

}