**Connecting Databases in VB.NET**

In ADO.net the databases are connected first, then a copy of the database is stored in the memory immediatley the connection to the database is disconnected. Database is connected only if any changes made to the copy of the database need to be updated to the datatbase itself.  
ADO.net classes are contained in the 'System.Date' namespace. Following are some of the important classes used in ADO.net.

* Connection
* Command
* DataAdapter
* DataReader
* DataSet

**Connection:**

This class is used to provide connection to the database. **SqlConnection** class is used for MS-SQL server database. **OleDBConnection** is used for databases like Oracle and MS-Access.

**Command:**

This class is used to provide the command to be executed on a database. The sql commands include select, update, insert and delete queries. Three major method used by this classes are:

* **ExecuteNonQuery** execute commands that dont return values,
* **ExecuteScalar** executes commands that returns a single value,
* **ExecuteReader** executes commands that returns a result set.

**DataAdapter:**

This class acts as bridge between the databases and the copy of the database in the memory.**Fill** method is used to populate the datatset or datatable with data from the database.**Update** method is used to update the database after the dataset is manipulated.

**DataReader**

This class acts as a read only or forward only action to fetch data from a database.**ExecuteReader** method is used to returns the object of this class.

**DataSet**

This class stores the copy of the database retrieved from the original.

Following example is used to display the records from an access database and enables to Insert, Update, Delete records. Also has buttons to traverse the database between Next, Previous, First and Last record.

**Example:**

Imports System.Data.OleDb  
Imports System.Console  
Public Class Form1  
Inherits System.Windows.Forms.Form  
Dim cn As OleDbConnection  
Dim cmd As OleDbCommand  
Dim dr As OleDbDataReader  
Dim icount As Integer  
Dim str As String  
Public head As New System.Data.DataTable  
Public No As Integer = 0  
Public headadaptor As New OleDbDataAdapter  
Public headcommand As New OleDbCommandBuilder

Private Sub Insert1\_Click(ByVal sender As System.Object, ByVal e As System.EventArgs) Handles Insert1.Click  
cn = New OleDbConnection("Provider=Microsoft.Jet.OLEDB.4.0;Data Source=C:student.mdb;")  
cn.Open()  
str = "insert into student values(" & CInt(TextBox1.Text) & ",'" & TextBox2.Text & "','" & \_TextBox3.Text & "'," &  
TextBox4.Text & ")"  
cmd = New OleDbCommand(str, cn)  
cmd.ExecuteNonQuery()  
MessageBox.Show("Data Inserted!...")  
cn.Close()  
initial()  
showRecords()  
End Sub

Private Sub Update2\_Click(ByVal sender As System.Object,ByVal e As System.EventArgs) Handles Update2.Click  
cn = New OleDbConnection("Provider=Microsoft.Jet.OLEDB.4.0;Data Source=C:student.mdb;")  
cn.Open()  
str = "update student set name='" & TextBox2.Text & "',  
sex='" & TextBox3.Text & "',age=" & \_TextBox4.Text &"  
where id=" & TextBox1.Text  
cmd = New OleDbCommand(str, cn)  
cmd.ExecuteNonQuery()  
MessageBox.Show("Data Updated!...")  
initial()  
showRecords()  
cn.Close()  
End Sub

Private Sub Delete3\_Click(ByVal sender As System.Object, ByVal e As System.EventArgs) Handles Delete3.Click  
cn = New OleDbConnection("Provider=Microsoft.Jet.OLEDB.4.0;Data Source=C:student.mdb;")  
cn.Open()  
initial()  
str = "delete from student where id=" & TextBox1.Text  
cmd = New OleDbCommand(str, cn)  
cmd.ExecuteNonQuery()  
MessageBox.Show("Data Deleted!...")  
head = New DataTable  
headadaptor.Fill(head)  
No = No - 1  
showRecords()  
initial()  
cn.Close()  
End Sub

Private Sub First4\_Click(ByVal sender As System.Object, ByVal e As System.EventArgs) Handles Button4.Click  
No = 0  
display()  
End Sub

Sub display()  
If (No <= head.Rows.Count - 1) Then  
TextBox1.Text = head.Rows(No)("ID").ToString  
TextBox2.Text = head.Rows(No)("Name").ToString  
TextBox3.Text = head.Rows(No)("Sex").ToString  
TextBox4.Text = head.Rows(No)("Age").ToString  
End If  
End Sub

Sub showRecords()  
cn = New OleDbConnection("Provider=Microsoft.Jet.OLEDB.4.0;Data Source=C:student.mdb;")  
cn.Open()  
cmd = New OleDbCommand("select \* from student", cn)  
dr = cmd.ExecuteReader  
While dr.Read()  
TextBox1.Text = dr(0)  
TextBox2.Text = dr(1)  
TextBox3.Text = dr(2)  
TextBox4.Text = dr(3)  
End While  
dr.Close()  
cn.Close()  
End Sub

Private Sub Form1\_Load(ByVal sender As System.Object,ByVal e As System.EventArgs) Handles MyBase.Load  
cn = New OleDbConnection("Provider=Microsoft.Jet.OLEDB.4.0;Data Source=C:student.mdb;")  
cn.Open()  
initial()   
End Sub

Sub initial()  
headadaptor = New OleDbDataAdapter("select \* from student",cn)  
headcommand = New OleDbCommandBuilder(headadaptor)  
headadaptor.Fill(head)  
display()  
End Sub

Private Sub Next6\_Click(ByVal sender As System.Object,ByVal e As System.EventArgs) Handles Next6.Click  
If (No = head.Rows.Count - 1) Then  
MsgBox("this is last")  
Else  
No = No + 1  
display()  
End If  
End Sub

Private Sub Last8\_Click(ByVal sender As System.Object, ByVal e As System.EventArgs) Handles Last8.Click  
No = head.Rows.Count - 1  
display()  
End Sub

Private Sub Previous7\_Click(ByVal sender As System.Object,ByVal e As System.EventArgs) Handles Previous7.Click  
If (No = 0) Then  
MsgBox("this is first")  
Else  
No = No - 1  
display()  
End If  
End Sub

Private Sub Clear9\_Click(ByVal sender As System.Object,ByVal e As System.EventArgs) Handles Clear9.Click  
TextBox1.Text = ""  
TextBox2.Text = ""  
TextBox3.Text = ""  
TextBox4.Text = ""  
End Sub

End Class

In the above Database Connection example the access database named 'student.mdb' is used with the 'ID' as the primary key. So the 'OleDbConnection', 'OleDbCommand' classes are used. A function named 'initial()' is used to populate the datatset using the 'Fill' method. And a display() method is used to display records.