A201 Object Oriented Programming with Visual Basic .Net

By:

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What do we need to learn in order to write computer programs?

- Fundamental programming constructs:
  - Variables,
  - Arithmetic operators,
  - Input and output
  - Conditionals,
  - Loops,
  - Procedures and functions,
  - Arrays (Multi-Dimensional Arrays),
  - Structures, classes and objects,
  - Files
  - Databases (Connecting VB to MS-ACCESS)
To Connect VB to MS-ACCESS

1. Import the System.Data.OleDb
2. Create a Connection object.
3. Create a SQL string.
4. Create a DataAdapter object.
5. Create a DataTable object and load the data into it.
6. Bind the DataTable to a VB control such as combobox, textbox, or DataGrid.
Import the System.Data.OleDb

Imports System.Data.OleDb
Create a Connection object

☐ Create a Connection String

```vbscript
Dim MyConnectionString As String
MyConnectionString = "Provider=Microsoft.Jet.OLEDB.4.0;
Data Source=Student_DB.mdb"
```

☐ Create a Connection

```vbscript
Dim MyConnection As New OleDbConnection(MyConnectionString)
```
Create a SQL String

- Create a query String (SQL Command)

```vba
Dim SQLQuery As String

SQLQuery = "SELECT
    Organization_Name, Last_Name, First_Name, city
FROM
    CIS_DATA
WHERE
    Classification = 'BUSINESSES' order by Last_Name"
```

- Display the Query String

```vba
MessageBox.Show(SQLQuery)
```
Create a DataAdapter Object

- Create a **DataAdapter Object** and connect to the provider. Then **send the SQLQuery for processing**.

```vbnet
Dim MyDataAdapter As OleDbDataAdapter
MyDataAdapter = New OleDbDataAdapter(SQLQuery, MyConnection)
```
Create a DataTable Object

- Create a DataTable and load it with data from the DataAdapter's query results.
  
  ```vbnet
  Dim StudentsDataTable As New DataTable
  MyDataAdapter.Fill(StudentsDataTable)
  ```

- Release all resources used by this DataAdapter.
  
  ```vbnet
  MyDataAdapter.Dispose()
  ```
Example: Extracting Data From Database

Imagine a database of friends with the following records:
Example: Extracting Data From Database

- Let us build a VB application that extracts this data and presents it in our application:
Example: Extracting Data From Database

In order to gain access to database functionality, we must load the proper library.

Imports System.Data.OleDb
Complete Example:

```
Option Explicit On
Option Strict On
'-----------------------------
Imports System.Data.OleDb
'-----------------------------

Public Class Form1
    Inherits System.Windows.Forms.Form

    Dim RecordNo As Integer

    Private Sub Form1_Load(ByVal sender As System.Object, ByVal e As System.EventArgs) Handles MyBase.Load
        RecordNo = 0
        DisplayRecord()
    End Sub

    Private Sub BtnNext_Click(ByVal sender As System.Object, ByVal e As System.EventArgs) Handles BtnNext.Click
        RecordNo += 1   ' increment the record number by 1.
        DisplayRecord()
    End Sub

    Private Sub BtnPrev_Click(ByVal sender As System.Object, ByVal e As System.EventArgs) Handles BtnPrev.Click
        RecordNo -= 1   ' decrement the record number by 1.
        DisplayRecord()
    End Sub

    Private Sub ButtonExit_Click(ByVal sender As System.Object, ByVal e As System.EventArgs) Handles ButtonExit.Click
        Close()
    End Sub

    Private Sub DisplayRecord()
        NEXT PAGE.....
    End Sub

End Class
```
Complete Example:

```vbnet
Private Sub DisplayRecord()
    '1) Create a Connection String, and specify the provider and the data source
    Dim connStr As String = "Provider=Microsoft.Jet.OLEDB.4.0;" & _
        "Data Source = myFriends.MDB"

    '2) Create a SQL query and send it to the database.
    Dim sqlStr As String = "SELECT LastName, FirstName, Telephone, Email FROM Friends"

    '3) Connect to the database via the OleDbDataAdapter
    Dim dataAdapter As New OleDbDataAdapter(sqlStr, connStr)

    '4) Receives the data from the database and places into DataTable (basically a 2D array).
    'Place the query result into a DataTable
    Dim dt As New DataTable 'An internal (in memory) datatable
    dataAdapter.Fill(dt) 'load DataTable from the database

    '5) Close the connection to the database.
    dataAdapter.Dispose() 'Get rid of the connection
    If RecordNo >= dt.Rows.Count Then
        RecordNo = dt.Rows.Count - 1
    End If
    If RecordNo < 0 Then
        RecordNo = 0
    End If

    'Get the Record corresponding to "RecordNo" and display it in the textboxes
   TxtBoxLastName.Text = CStr(dt.Rows(RecordNo)("LastName"))
   TxtBoxFirstName.Text = CStr(dt.Rows(RecordNo)("FirstName"))
   TxtBoxTelephone.Text = CStr(dt.Rows(RecordNo)("Telephone"))
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End Sub
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Output:

Form 1

Last Name: Smith
First Name: John
Telephone: 574-333-5555
Email: jsmith@iusb.edu

Form 1

Last Name: Johnson
First Name: Tim
Telephone: 888-333-3332
Email: tjohnson@iusb.edu

Form 1

Last Name: Thomas
First Name: Mary
Telephone: 666-777-8888
Email: mthomas@iusb.edu

Form 1

Last Name: Clark
First Name: Sue
Telephone: 876-987-2345
Email: sclark@gmail.com