

**<DEUTRAIN>**  
DEVELOPER TRAINING SOLUTIONS

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**LINQ: Bringing Data into Visual Basic**

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**Some New VB 9.0 Features** **<DEUTRAIN>**  
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- **Type Inference**
  - Local variables / strongly types
- **Object and collection initialisers**
- **Anonymous Types**
- **Extension Methods**
  - System.Query namespace contains ...
  - Sequence class with methods that extend IEnumerable (Of T)

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**Extension Methods** **<DEUTRAIN>**  
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Aggregate	OfType
All / Any	OrderBy
Average	Select
Concat	Skip / SkipWhile
Contains	Take / TakeWhile
Count	ThenBy
Distinct	ToArray
First / Last	ToDictionary
Fold	ToList
GroupBy	ToLookup
Intersect	ToSequence
Join / GroupJoin	Union
Max / Min / Sum	Where

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LINQ


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**■ Language Integrated Query**

```
Dim result = From p In Person.GetList(), d In Department.GetList() _
             Where p.Dept = d.Number _
             Select p.Name, DeptName := d.Name _
             Order By DeptName, Name
```

```
Dim result = (From p In Person.GetList() _
             Group By p.Dept _
             Select Dept := It.key, People := It).ToList()
```

```
Dim result = (From p In System.Diagnostics.Process.GetProcesses() _
             Select Name := p.ProcessName, _
             Size := CInt(p.WorkingSet64 / (1024 ^ 2)) _
             Order By Size Descending).Take(10)
```

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LINQ over DataSets


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- Supports joins between DataTables
- Works for DataSets and Typed DataSets
- Requires
  - VB9 compiler
  - System.Data.Extensions.dll, which contains...

... Extension methods for System.Data

Class	Extension Methods
DataRowExtensions	Field/SetField
DataTableExtensions	ToQueryable, ToDataTable, DistinctRows, UnionRows etc
TypedTableBaseExtensions	Where, GroupBy, OrderBy, Select, Join, Union, Max, Min etc

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DLINQ


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- 'The future of ADO.NET'?
- Use LINQ query syntax to extract strongly typed objects from tables and stored procedures
  - Accessed via DataContext object
- Provides O/R Mapping
  - Object Identity
  - Relationships (associations)
  - Change tracking
  - Concurrency management and conflict resolution
- Design-time code generation

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## Entity Classes

- Decorate classes with attributes:
 

```
<Table(Name:="Orders")> _
Public Class CustomerOrder
    ...
    <Column(Id:=True)> _
    Public Property OrderID() As Integer
    ...
End Property
<Column()> _
    Public Property OrderDate() As DateTime
```
- Initialise data context:
 

```
Dim db As New DataContext("<connection strings>")

Dim orders = db.GetTable(Of CustomerOrder)()
'create IQueryable (Of CustomerOrder)
Dim result = From o In orders _
    Select o
```

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## Stored Procedures

- Create data access layer declaratively:
  - Access method reflects over itself
  - Parameter objects generated automatically
  - Automatically generates entity instances

```
<StoredProcedure(Name:="CustOrdersOrders")> _
Public Function CustOrdersOrders(ByVal CustomerID As String) _
    As StoredProcedureResult(Of CustomerOrder)
    Return Me.db.ExecuteStoredProcedure(Of CustomerOrder) _
        (CType(MethodInfo.GetCurrentMethod, MethodInfo), CustomerID)
End Function

Dim result = Me.CustOrdersOrders("ANTON")
Me.DataGridView1.DataSource = result.ToList()
```

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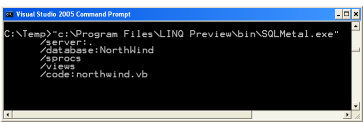
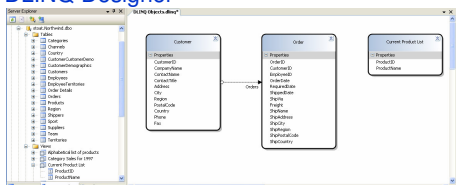
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## Design time Tools

- SQLMetal
 
- DLINQ Designer
 

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