Lập trình web nâng cao

LinQ

Th.S Cao Thái Phương Thanh
caothaiphuongthanh@gmail.com

Content

✦ Introduce to LinQ

✦ ADO.NET Entity Data Model

LinQ

✦ LinQ – Language Intergrated Query – since .NET 3.5

✦ Query data from a wide variety of data sources

✦ Intergrated into (i.e. a part of) .NET framework

- Support programming data type
- Available in all kinds of .NET projects

✦ LinQ in .NET programming ~ SQL in relational database

- LinQ syntax is closely model after SQL

LinQ

| Visual C# | Visual Basic | Others |

.Net Language Integrated Query (LINQ)

LINQ-enabled data sources

LINQ-enabled ADO.NET

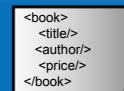| LINQ To Objects | LINQ To Datasets | LINQ To SQL | LINQ To Entities | LINQ To XML |

Objects   Databases   XML

LinQ

+ The first example: C# console application for quickness

  ● Get names containing 'h' from a list of string

  ● Get people older than 22 from a list of people

    ▪ Shapping data with anonymous type

  ● (Copy source LinQ to ASP.NET website)

+ Comments from the example:

  ● LinQ supports IntelliSense

  ● LinQ can query from many kinds of **data collection**

LINQ

+ Cú pháp câu truy vấn LINQ

```
from id in source
[ where condition ]
[ orderby ordering ]
select expr
[ group expr by key into id query ]
```

http://code.msdn.microsoft.com/101-LINQ-Samples-3fb9811b

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LINQ

✦ Cú pháp câu truy vấn LINQ

Restriction	Where
Projection	Select, SelectMany
Ordering	OrderBy, ThenBy
Grouping	GroupBy
Quantifiers	Any, All
Partitioning	Take, Skip, TakeWhile, SkipWhile
Sets	Distinct, Union, Intersect, Except
Elements	First, FirstOrDefault, ElementAt
Aggregation	Count, Sum, Min, Max, Average
Conversion	ToArray, ToList, ToDictionary
Casting	OfType<T>

http://code.msdn.microsoft.com/101-LINQ-Samples-3fb9811b

LinQ vs SQL

```
SqlConnection conn = new SqlConnection("...");
SqlCommand cmd = conn.CreateCommand();
cmd.CommandText = @" SELECT *
                     FROM   Car
                     WHERE  Model = @Model";

cmd.Parameters.Add("@Model", "Mazda 3");

SqlDataReader r = cmd.ExecuteReader();
while ( r.Read() )
{
    Console.WriteLine(r["Number"] + r["Year"]);
}
```

No intelligence

No compile time checks

Loosely bound arguments

Untyped Results

LinQ vs SQL

```
CarEntities db = new CarEntities(…);
var cars =
    from c in db.Cars
    where c.Model == "Mazda 3"
    select new { c.Name, c.Number };
```

LinQ vs SQL

```
SELECT p.*
FROM Purchase p
    LEFT OUTER JOIN
        Customer c INNER JOIN Address a ON c.AddressID = a.ID
    ON p.CustomerID = c.ID
WHERE
    (a.State = 'WA' || p.CustomerID IS NULL)
    AND p.ID in
    (
        SELECT PurchaseID FROM PurchaseItem
        GROUP BY PurchaseID HAVING SUM (SaleAmount) > 1000
    )
```

LinQ vs SQL

```
from p in db.Purchases
where p.Customer.Address.State == "WA" || p.Customer == null
where p.PurchaseItems.Sum (pi => pi.SaleAmount) > 1000
select p
```

LinQ

Visual C#	Visual Basic	Others

.Net Language Integrated Query (LINQ)

LINQ-enabled data sources

LINQ-enabled ADO.NET

LINQ To Objects	LINQ To Datasets	LINQ To SQL	LINQ To Entities	LINQ To XML

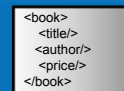Objects   Databases   XML

```
<book>
  <title/>
  <author/>
  <price/>
</book>
```
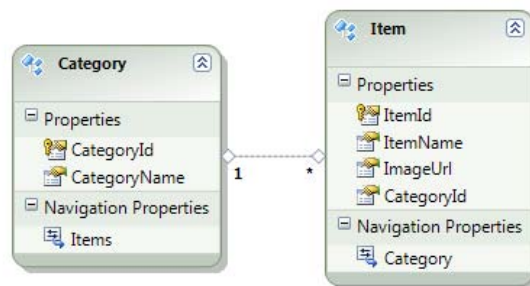
LinQ to Entity

✦ An instance of Object Relational Mapping (ORM)

- Table ~ Class

- Row ~ Object (i.e. instance of a class)

- Relationship ~ Class member

  ▪ Category – Items (1 – n) relationship

    + Class Item has a Category member

    + Class Category has a List<Items> member

- Add, update, delete are called via class's methods

- Query by LinQ

✦ In .NET, LinQ to Entity somewhat deprecates LinQ to SQL

LinQ to Entity

✦ Example of category - items

- Add new item ADO.NET Entity Data Model : surprisingly easy

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LinQ to Entity

✦ Example of category - items

- Product.aspx: display list of Items (an item has category name)

  ▪ Code manually (Page_Load)

  ▪ `Eval("ItemName")`

  ▪ `Eval("Category.CategoryName")`

  →Pager does not work because of Page_Load

  →Datasource for ListView instead of hand-code: **LinQ Data Source**

  + Must have OrderBy for paging

- Search items by name

LinQ to Entity

✦ Example of category - items

- Product.aspx: Search items by name & category

  ▪ Add textbox & button

  ▪ Click: set where of LinQDataSource

  ▪ Search when viewing page 2: must reset page before search

LinQ to Entity

✦ Example of category - items

- ProductDetail.aspx
  - Replace SqlDataSource by LinQDataSource (set DataKeysMember of FormView)
  - Our LinQDataSource does not inherit DataContext (Linq to Sql) so we cannot insert, update, delete directly by LinQDataSource
  - → We do it manually by entity code
    + FormView1_ItemDeleting: select FirstorDefault<Item>(), e.Keys, e.Cancel
    + FormView1_ItemUpdating: e.NewValues["Name"] string to data types
    + FormView1_ItemInserting: ImageUrl…

ADO.NET entity framework in 3–layer model

✦ ADO.NET entity framework provides entity classes

→ How do we use these classes in 3-layer model ?

LinQ is **not** compulsory for the course project