

Practical LINQ

LINQ by Example

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Examples Not Descriptions



LINQ Syntax

- **Query Syntax**
 - Declarative
 - In the language
- **Method Syntax**
 - Methods
 - In the .NET Framework (System.Linq)
- **Semantically equivalent**

LINQ Syntax

- **Query Syntax**

- Declarative
- In the language

```
var query = from c in customerList
             where c.CustomerId == customerId
             select c;
```

- **Method Syntax**

- Methods
- In the .NET Framework (System.Linq)

```
var query = customerList.Where(c =>
                             c.CustomerId == customerId);
```

- **Semantically equivalent**

Enumerable Class

Enumerable.

- Except<>
- First<>
- FirstOrDefault<>
- GroupBy<>
- GroupJoin<>
- Intersect<>
- Join<>
- Last<>
- LastOrDefault<>

Terminology

- **LINQ**
 - Query Syntax
 - Method Syntax
- **Extension Methods**
- **Delegates**
- **Lambda Expressions**

LINQ

- Language Integrated Query
- Standard Set of Query Operators
 - Traversal
 - Filter
 - Projection

```
var secondCustomer = customerList  
                        .Skip(1)  
                        .FirstOrDefault();
```

LINQ

- Language Integrated Query
- Standard Set of Query Operators
 - Traversal
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```
var query = from c in customerList
             where c.CustomerId == customerId
             select c;
```


Query Syntax

- Defines a LINQ query using SQL-like syntax
- Converted to method syntax by the compiler
- Not every LINQ operator is available when using this syntax

```
var query = from c in customerList
             where c.CustomerId == customerId
             select c;
```

Extension Methods

- Method added to a type to extend its functionality
- Static Class
- Static Method
- `this` keyword
- Called as an instance method

```
public static class StringExtensions
{
    public static string ConvertToTitleCase(this string source)
    {
        CultureInfo cultureInfo = Thread.CurrentThread.CurrentCulture;
        TextInfo textInfo = cultureInfo.TextInfo;
        return textInfo.ToTitleCase(source)
    }
}
```

Method Syntax

- Defines a LINQ query by calling extension methods
- Extension methods defined in the Enumerable class of System.Linq
- Often have parameters that take Lambda expressions

```
foundCustomer = customerList.FirstOrDefault(c =>  
    c.CustomerId == customerId);
```

Delegate

- Delegates the responsibility for an operation to another function
- Object-oriented, type-safe function pointer
- Defined with:
 - A named method
 - A delegate expression
 - A Lambda expression

```
foundCustomer = customerList.FirstOrDefault(c =>  
    c.CustomerId == customerId);
```

Lambda Expression

- **Unnamed, inline function**
- **Single statement**
 - Does not require a return
- **Multiple statement**
- **Used in delegate parameters**



```
foundCustomer = customerList.FirstOrDefault(c =>  
    c.CustomerId == customerId);
```

Lambda Expression

- Unnamed, inline function
- Single statement
 - Does not require a return
- Multiple statement
- Used in delegate parameters



```
foundCustomer = customerList.FirstOrDefault(c =>
    {
        Debug.WriteLine(c.LastName);
        return c.CustomerId == customerId;
    });
```

Chaining

- Extension methods can be chained together

```
foundCustomer = customerList
    .Where(c =>
        c.CustomerId == customerId)
    .Skip(1)
    .FirstOrDefault();
```

Deferred Execution

- LINQ queries are executed when the query variable is iterated over
- NOT when the query variable is declared

```
var query = from c in customerList
            where c.CustomerId == customerId
            select c;
```

```
foundCustomer = query.First();
```


Summary

- **LINQ**
 - Query syntax
 - Method syntax
- **Terms, Terms, Terms**
 - Extension Methods
 - Delegates
 - Lambda Expressions