

Sela.

50066

LINQ via C#

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LINQ via C#

50066 - Version: 2.1

 3 days Course

Description:

This three-day instructor-led course provides students with the knowledge and skills to develop applications with the C# 3.0 language and the LINQ (Language Integrated Query) framework.

LINQ is Microsoft's framework for bridging the gap between various data sources and the .NET object-oriented languages. LINQ abstracts away the data source, providing an intuitive, declarative and uniform query interface to object collections, SQL-based relational databases and XML documents. Its extensibility features facilitate integrating additional data sources through the use of custom query providers. LINQ C# integration relies heavily on a set of new features of the C# 3.0 language.

The course is packed with practical code samples, demos and exercises to facilitate understanding the motivation of LINQ, the design patterns for its application, and its potential pitfalls.

Intended audience:

This course is intended for C# developers with practical experience in the .NET framework.

Prerequisites:

Working knowledge of C# 2.0: Generics, anonymous methods, iterators

Working knowledge of the .NET framework: Collections, ADO.NET basics, XML

Objectives:



Apply the new C# 3.0 language features in appropriate and practical scenarios

Apply the LINQ framework for accessing various types of data sources

Gain a general understanding of the LINQ extensibility model for writing query providers and customizing existing data sources

Gain a general understanding of future frameworks in the LINQ area, including ADO.NET Data Services, ADO.NET Entity Framework, Parallel LINQ and other

Topics:

Module 1: C# Language Features

- Developer Productivity
 - Implicit typing
 - Object and collection initializers
 - Automatic properties
 - Anonymous types
- Extensibility Concepts
 - Extension methods
 - Partial methods
- Functional Programming Features
 - Lambda expressions
 - Expression trees
- LINQ Support Features
 - An overview of language query operators.
- Lab 1: Extension Methods and IEnumerable<T>
 - ForEach extension method for IEnumerable<T>.
 - MaxElement extension method for IEnumerable<T>.
- Lab 2: Extension Methods and Anonymous Types
 - Extension method for turning anonymous types into tuples.



Module 2: LINQ Query Operators

- Motivation for Query Operators
 - Declarative vs. Imperative programming.
- Developing Query Operators
 - C# 2.0 iterators
 - Deferred execution
- Categorizing query operators
 - Filtering
 - Aggregation
 - Ordering
 - Grouping
 - Projection
 - miscellaneous operators
- Language integration of query operators
- Lab 3: Implementing Query Operators
 - Implementing LastOrDefault, Cast, Concat and Aggregate.

Module 3: Applied LINQ to Objects

- Using Query Operators with Objects.
- Customizing query operators
- The query pattern
- Examples of LINQ to Objects
 - LINQ to Reflection
 - LINQ to File System
 - LINQ to Strings
 - LINQ to WCF Contracts
- Lab 4: Implementing the Query Pattern
 - Implementing the query pattern for the DataTable class.
- Lab 5: Using LINQ Queries



- Using LINQ to query the file system.
- Using LINQ to query the .NET Reflection API.

Module 4: LINQ to XML

- Introducing the XElement API
- Constructing XML fragments with XElement
- Querying XElement DOMs
- Axis methods
- Lab 6: LINQ to XML
 - XML query and transform using LINQ.
 - XML query and aggregation using LINQ to XML and LINQ to Objects.

Module 5: LINQ to SQL

- LINQ to DataSet
 - Why DataSets are not enough.
- LINQ to SQL as an Object-Relational Mapper
 - Mapping using attributes
 - mapping using external XML mapping files
 - mapping inheritance relationships
- The Data Context
 - Queries
 - updates
 - inserts
 - deletes
 - stored procedures and database functions
 - custom SQL strings
 - database creation from schema
 - transactions



- preloading and tracking data
- optimistic locking and concurrency control
- Visual Studio LINQ to SQL Designer vs. SQLMetal.
- Lab 7: Integrating XML Mapping
 - Constructing a DataContext from embedded XML mapping files.
- Lab 8: Testing Concurrency Control and Object Tracking
 - Transactional work and concurrency control.
 - Non-transactional work and conflict management.
 - Object tracking and identity management.
- Lab 9: Inheritance Mapping
 - Mapping a hierarchy using attributes.
 - Creating a database from schema.

Module 6: Beyond LINQ

- Overview of Parallel LINQ.
- Overview of ADO.NET Entity Framework.
- Overview of ADO.NET Data Services.
- Overview of Custom Query Providers.
- Performance Considerations of LINQ to Objects.
- Performance Considerations of LINQ to XML.
- Performance Considerations of LINQ to SQL.