

Entity Framework & LINQ



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LINQ

- Language Integrated Query
- A *query* is an expression that retrieves data from a data source.
- The *Language Integrated* part means that LINQ is part of programming language syntax.
- It is integrated in C# or VB, thereby eliminating the mismatch between programming languages and databases, as well as providing a single querying interface for different types of data sources.

LINQ

- LINQ is a structured query syntax built in C# and VB.NET used to save and retrieve data from different types of data sources like an Object Collection, SQL server database, XML, web service etc.



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Developer

Uses

L
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Q

To Query

Object Collection

LINQ to Objects

ADO.Net Dataset

LINQ to DataSet

XML Document

LINQ to XML

Entity Framework

LINQ to Entities

SQL Database

LINQ to SQL

Other data sources..

By implementing
IQueryable

LINQ Usage

LINQ

- Use **System.Linq** namespace to use LINQ.
- LINQ api includes two main static class Enumerable & Queryable.
- The static **Enumerable** class includes extension methods for classes that implements IEnumerable<T> interface.
- IEnumerable<T> type of collections are in-memory collection like List, Dictionary, SortedList, Queue, HashSet, LinkedList
- The static **Queryable** class includes extension methods for classes that implements IQueryable<T> interface
- Remote query provider implements IQueryable<T>. eg. Linq-to-SQL, LINQ-to-Amazon etc.

LINQ

- Two ways to write LINQ queries:
 - Lambda expression
 - SQL like query expression

Eg. Lambda Expression

```
DataClasses1DataContext dc = new DataClasses1DataContext();  
dataGridView2.DataSource = dc.Persons.Where(p => p.Age < 30);
```

Eg. SQL like query Expression

```
DataClasses1DataContext dc = new DataClasses1DataContext();  
dataGridView1.DataSource = from p in dc.Persons where p.Age>30 select p;
```

Advantages

- **Familiar language:** Developers don't have to learn a new query language for each type of data source or data format.
- **Less coding:** It reduces the amount of code to be written as compared with a more traditional approach.
- **Readable code:** LINQ makes the code more readable so other developers can easily understand and maintain it.
- **Standardized way of querying multiple data sources:** The same LINQ syntax can be used to query multiple data sources.
- **Compile time safety of queries:** It provides type checking of objects at compile time.
- **IntelliSense Support:** LINQ provides IntelliSense for generic collections.
- **Shaping data:** You can retrieve data in different shapes.

Entity Framework

- ORM (Object Relational Mapping)
- available as part of the .NET development (version 3.5 SP1 and later)
- Its purpose is to abstract the ties to a relational database, in such a way that the developer can relate to the database entity as to a set of objects and then to classes in addition to their properties.
- Two approaches – Database First and Code First.

EF vs LINQ to SQL

- EF supports multiple database whereas LINQ to SQL is mainly SQL Server.
- EF is more adaptable to database changes whereas LINQ to SQL is poor in adapting to changes in the database structure.
- EF lets you choose between Code First, Model First and Database First approach whereas LINQ to SQL is DB First always.
- For EF a .edmx file gets created whereas for LINQ to SQL a .dbml file gets created.