

# C# Language-Integrated Query (LINQ)

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Why You Should Use LINQ



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# Course Goals



- **What is and why use LINQ?**
- **Selecting and Ordering**
- **Searching**
- **Iterating and Partitioning**
- **Inspecting Collections**
- **Joining and Grouping**
- **Aggregating and Distinct**
- **Understanding Deferred Execution**



## **I assume you...**

- Are a C# developer
- Are familiar with Visual Studio
- Want to learn to use LINQ

## **Prerequisites**

- C# Generics
- C# Delegates, Lambda Expressions
- C# Extension Methods

# Why Watch This Course

**Learn LINQ query/method  
syntax side-by-side**

**Over 60 demos across 10  
modules!**

# How to Get the Most out of This Course

**Watch this module for important LINQ basics**

**Download the starting exercises**

**Follow along with the demos**

**Download starting exercises at  
[www.pdsa.com/pluralsight](http://www.pdsa.com/pluralsight)**

What is LINQ?

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# LINQ

**SQL-like syntax in  
C# and Visual  
Basic**

**Query any type of  
collection  
(IEnumerable<T>)**

**Query external  
data sources (xml,  
databases, JSON,  
csv, etc.)**

# LINQ

**Unified approach for querying  
any type of objects**

**Helps eliminate loops**

**IntelliSense support**

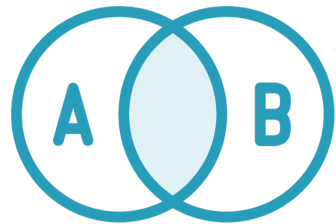
**Type-checking of objects at  
compile time**



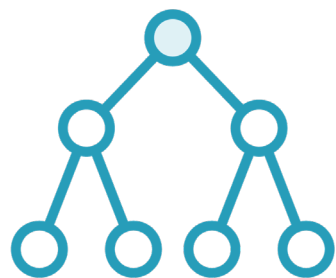
# Common IEnumerable Types



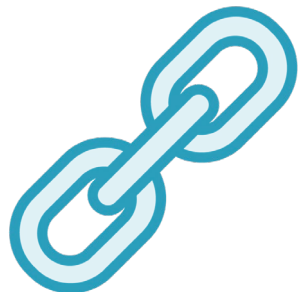
**Any array**



**String (Array of characters)**



**List<T> (Examples: List<Product>, List<Customer>)**



**HashSet<T>, Dictionary<TKey, TValue>, LinkedList<T>, etc.**

# SQL Query vs LINQ Query Syntax

## SQL

**SELECT \* FROM Products**

**SELECT Name FROM Products**

**SELECT \* FROM Products  
WHERE ListPrice > 10**

## LINQ

**from prod in Products  
select prod**

**from prod in Products  
select prod.Name**

**from prod in Products  
where prod.ListPrice > 10  
select prod**

# SQL Query vs LINQ Query Syntax

## SQL

```
SELECT * FROM Products  
ORDER BY Name DESC
```

```
SELECT DISTINCT Color FROM  
Products
```

```
SELECT Sum(ListPrice) FROM Products
```

## LINQ

```
from prod in Products  
OrderBy prod.Name descending  
select prod
```

```
(from prod in Products  
select prod).Distinct()
```

```
(from prod in Products  
select prod.ListPrice).Sum()
```

# Two LINQ Syntaxes

## Query

```
from prod in Products  
select prod
```

```
from prod in Products  
select prod.Name
```

```
from prod in Products  
where prod.ListPrice > 10  
select prod
```

## Method

```
Products.Select(prod => prod)
```

```
Products.Select(prod => prod.Name)
```

```
Products  
    .Where(prod => prod.ListPrice > 10)  
    .Select(prod => prod)
```

# What Can You Do With LINQ?

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# LINQ Operations

**Select**

**Projection  
(change shape)**

**Order  
(ascending /  
descending)**

**Get an Element  
(find, first, last,  
single)**

**Filter  
(where)**

# LINQ Operations

**Iteration / Partioning**  
**(foreach, skip, take)**

**Quantify**  
**(any, all, contains)**

**Set Comparison**  
**(equal, except, intersection)**

**Set Operations**  
**(union, concat)**

# LINQ Operations

**Joining**  
**(inner joins, outer joins)**

**Grouping**  
**(groupby, subquery, groupjoin)**

**Distinct Sets**  
**(distinct)**

**Aggregation**  
**(count, sum, min, max, average)**



# Using LINQ

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# Using LINQ

**Must add using statement  
using System.Linq;**

**Extension methods of  
Enumerable and Queryable  
objects**

# LINQ to Objects

**LINQ and Strings**

**LINQ and Reflection**

**LINQ and File  
Directories**

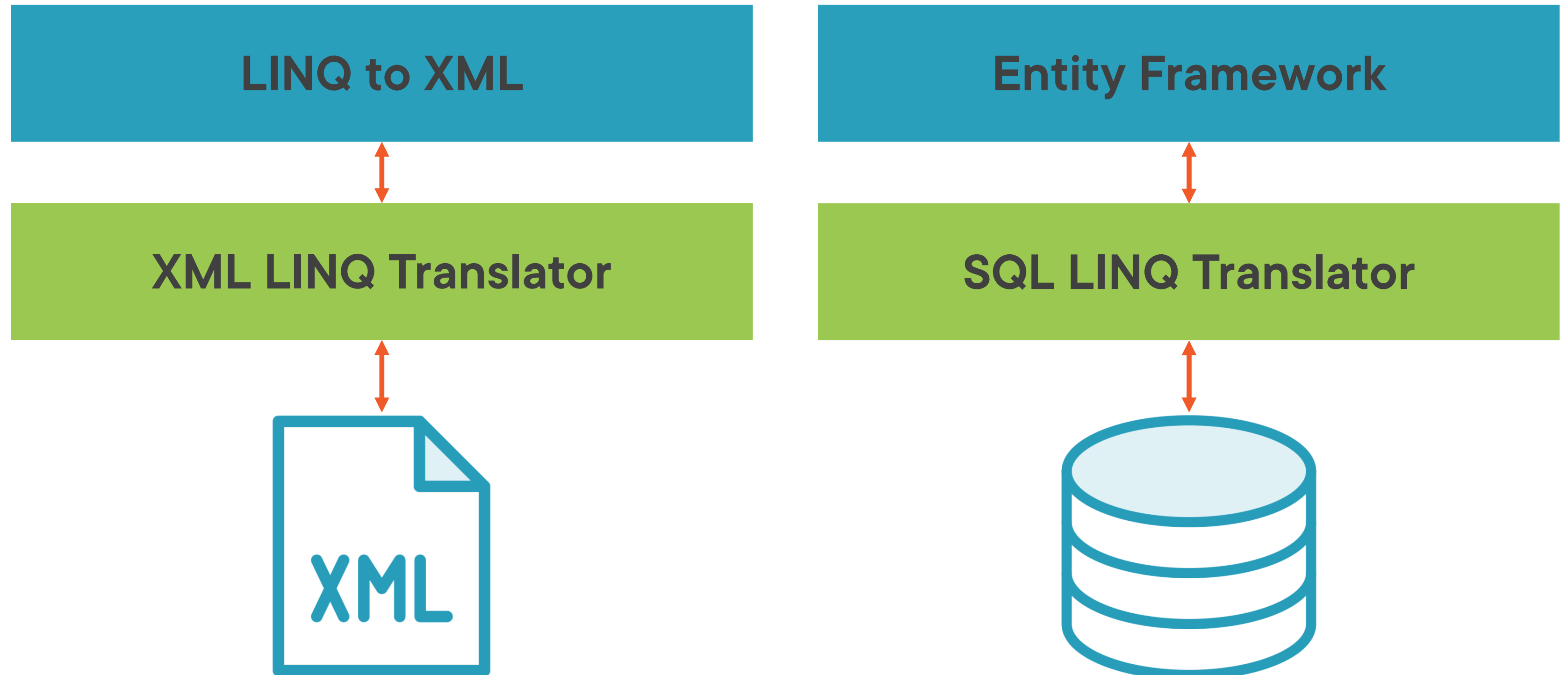
**LINQ to Entities**

**LINQ to DataSet**

# LINQ Integrations

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# LINQ Integrations



# LINQ Integrations

**LINQ to XML**

**Entity Framework**

**Pluralsight Course:  
Working with XML in C#**

**Pluralsight Course:  
Getting Started with  
Entity Framework 6**

# Module Summary



- LINQ is a sql-like syntax for C#/Visual Basic
- Can be used with many types of collections
- Can search, order, group, etc.
- Can integrate with XML, databases
- Search for LINQ at [www.pdsa.com/blog](http://www.pdsa.com/blog)

Up Next:

Using LINQ Select and Order Operations

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