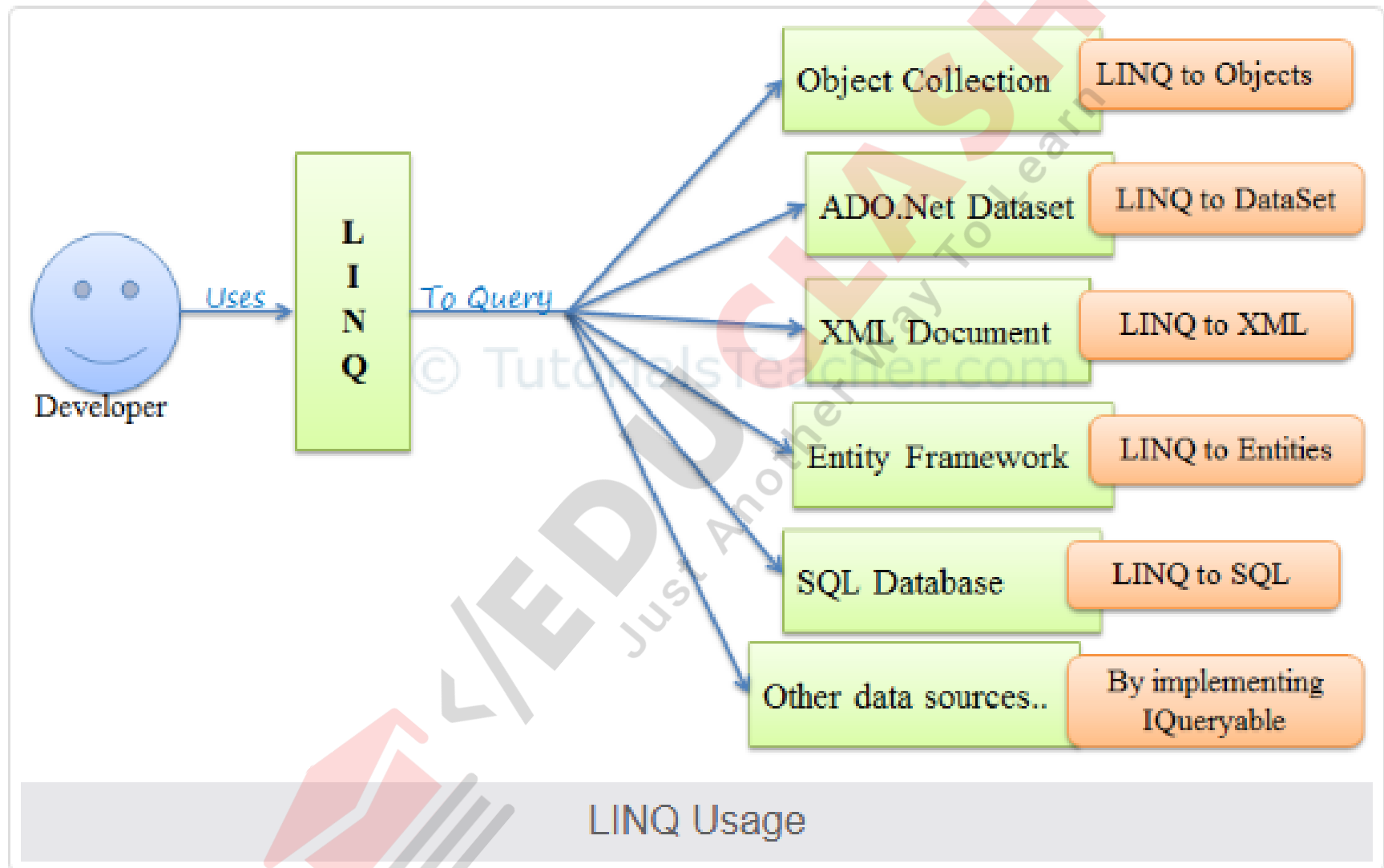# Entity Framework & LINQ

[Vipin Dubey]

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.

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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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LINQ Usage

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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.

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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.

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