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LINQ in C#

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Agenda

- What LINQ is?
- System.Linq
- System.Linq.Enumerable
- System.Linq.Queryable
- Query sintax
- Method sintax
- Standard query operators

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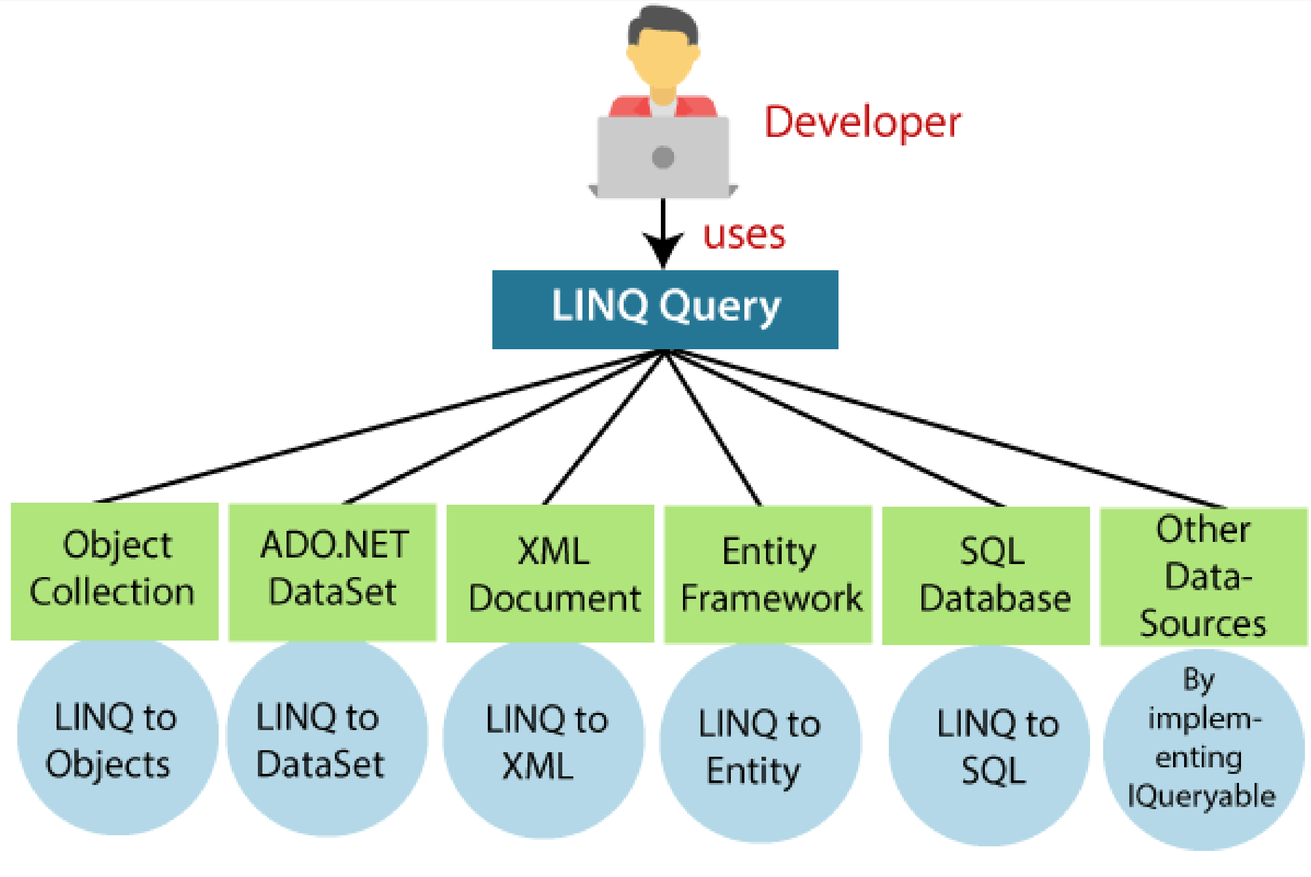
What LINQ is?

- LINQ (Language Integrated Query) is uniform query syntax in C# and VB.NET to retrieve data from different sources and formats.

- The data source could be a collection of objects, database or XML files.



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System.Linq

- We can write LINQ queries for the classes that implement IEnumerable<T> or IQueryable<T> interface

- LINQ queries uses extension methods for classes that implement *IEnumerable* or *IQueryable* interface. The *Enumerable* and *Queryable* are two static classes that contain extension methods to write LINQ queries.

- https://docs.microsoft.com/en-us/dotnet/api/system.linq?redirectedfrom=MSDN&view=netframework-4.8

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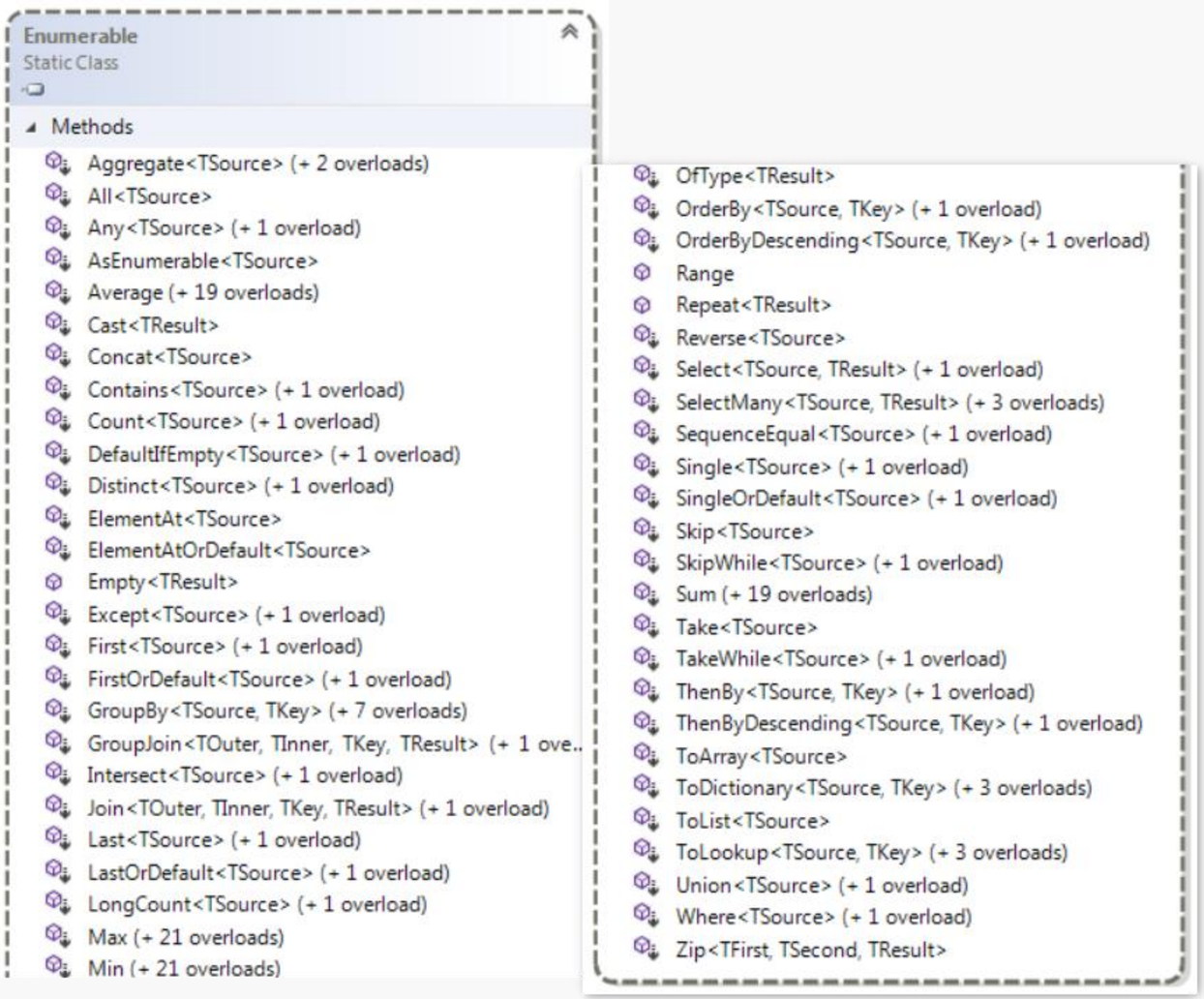
System.Linq.Enumerable

- The methods in this class provide an
- implementation of the standard
- query operators for querying
- data sources that implement
- IEnumerable<T>

- https://docs.microsoft.com/en-us/dotnet/api/system.linq.enumerable?view=netframework-4.8



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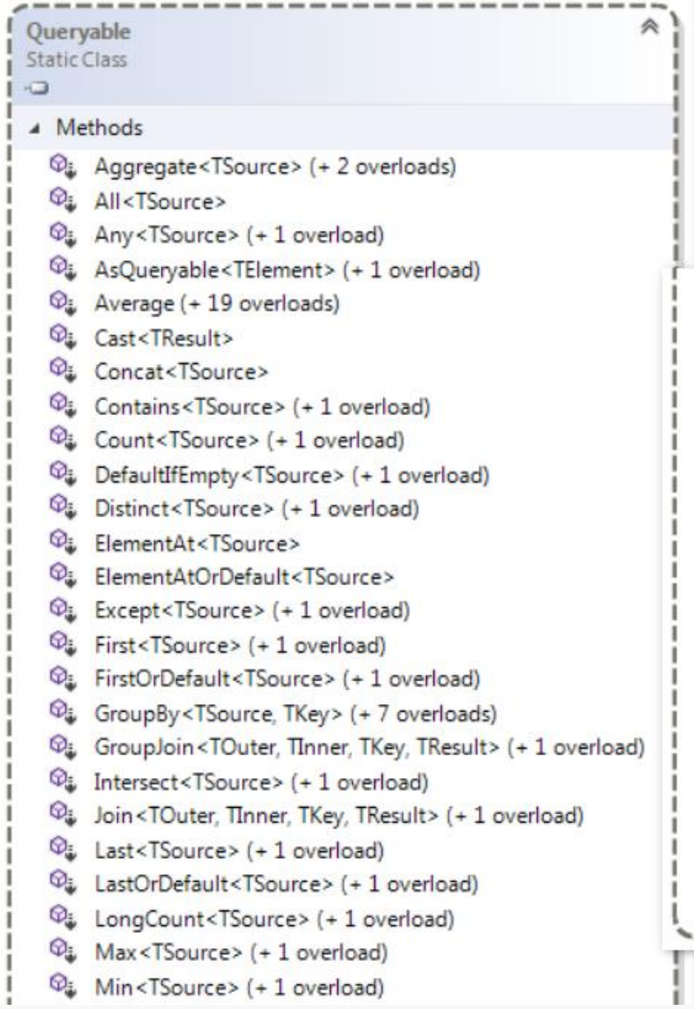
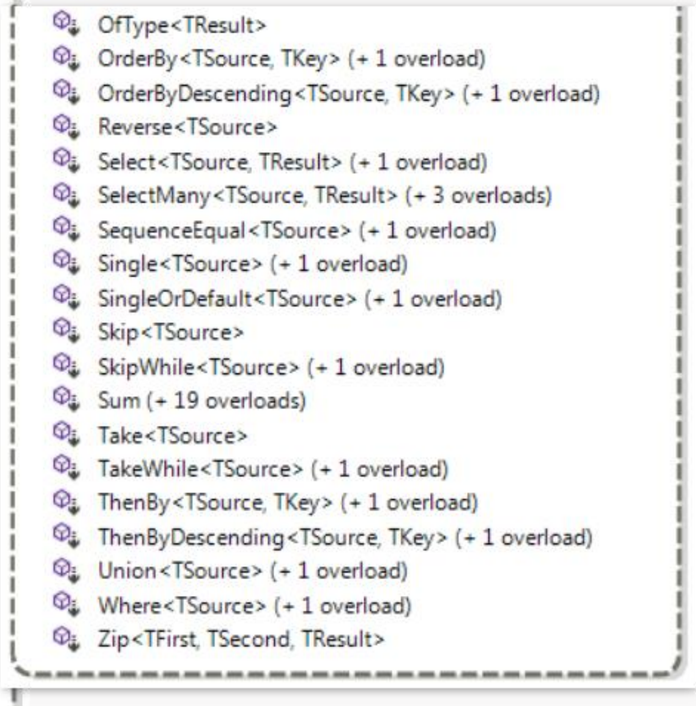
System.Linq.Queryable

- includes extension methods for classes that implement IQueryable<t> interface
- The IQueryable<T> interface is used to provide querying capabilities against a specific data source where the type of the data is known
- Entity Framework api implements IQueryable<T> interface to support LINQ queries with underlaying databases such as MS SQL Server
- Check here





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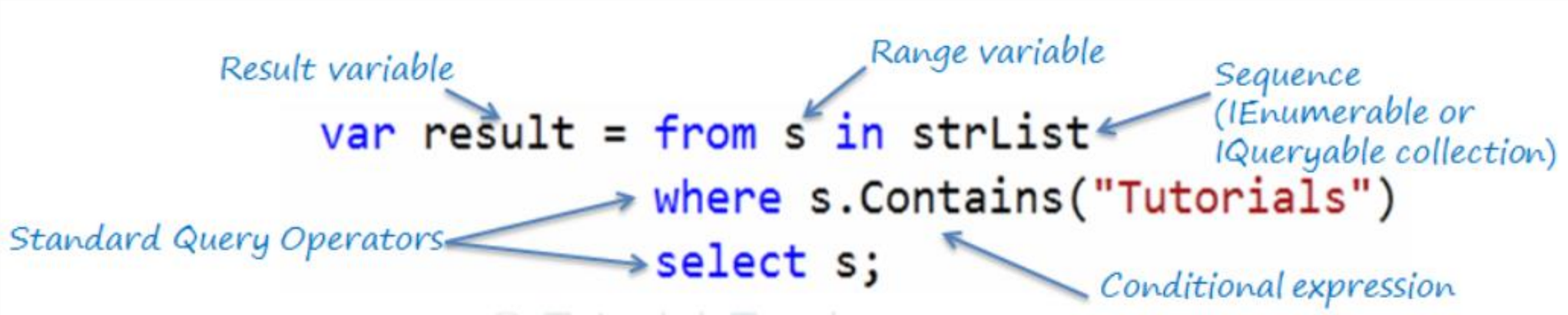
Query sintax

- Query syntax is similar to SQL (Structured Query Language) for the database. It is defined within the C# or VB code.
- The LINQ query syntax starts with **from** keyword and ends with **select** keyword
- LINQ query syntax always ends with a **Select** or **GroupBy** clause



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Method sintax

- Method syntax (also known as fluent syntax) uses extension methods included in the Enumerable or Queryable static class, similar to how you would call the extension method of any class

```
var result = strList.Where(s => s.Contains("Tutorials"));
```

Extension method

Lambda expression

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Standard query operators

Classification	Standard Query Operators
Filtering	Where, OfType
Sorting	OrderBy, OrderByDescending, ThenBy, ThenByDescending, Reverse
Grouping	GroupBy, ToLookup
Join	GroupJoin, Join
Projection	Select, SelectMany
Aggregation	Aggregate, Average, Count, LongCount, Max, Min, Sum
Quantifiers	All, Any, Contains
Elements	ElementAt, ElementAtOrDefault, First, FirstOrDefault, Last, LastOrDefault, Single, SingleOrDefault
Set	Distinct, Except, Intersect, Union
Partitioning	Skip, SkipWhile, Take, TakeWhile
Concatenation	Concat
Equality	SequenceEqual
Generation	DefaultEmpty, Empty, Range, Repeat
Conversion	AsEnumerable, AsQueryable, Cast, ToArray, ToDictionary, ToList

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Homework

- Create an object for Cart { ProductType, Name}
- Create an object Product { ProductType, Name, Price }
- Create an enum ProductType { Book, Food, Clothes }

- Create a list with products.
- Create a cart that will contain all the products from the previous list, that have ProductType = Food and have the price bigger than 200
- Add in the cart all the clothes products that have a name starting with “B”
- Add in the cart all the Books that have a Price smaller than 50
- Group by productType all the products from the card, and display them ordered descending by price
- Check if you have (in the cart) any clothes
- Take the first element that have a price bigger that 20. If this not exist, the result need to be null.

- ** you can put your ideas

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Reference

- https://www.tutorialsteacher.com/linq/linq-tutorials
- https://docs.microsoft.com/en-us/dotnet/api/system.linq?view=netframework-4.8

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Thank you!

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