

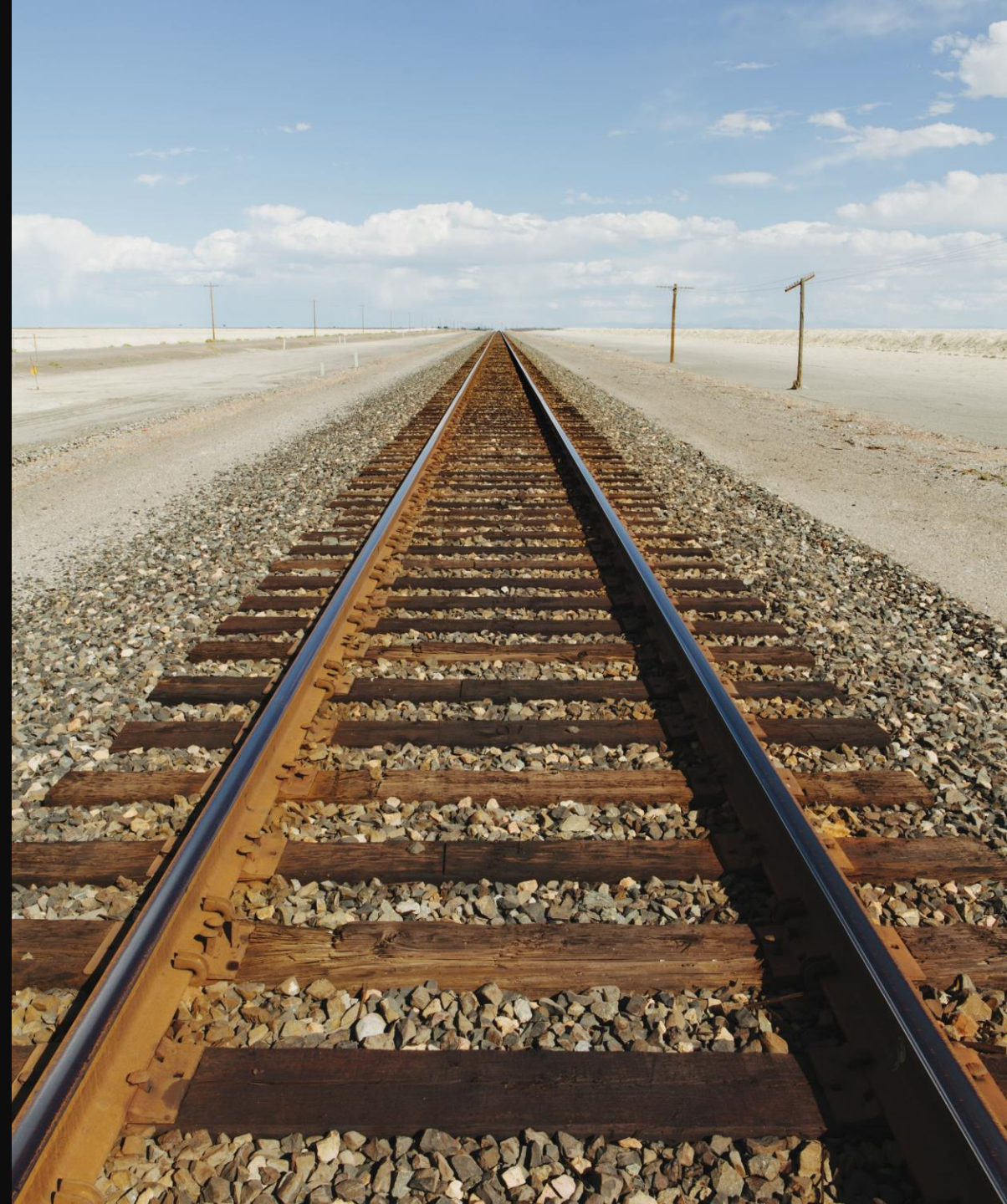
Language Integrated Query

Chapter 9

<https://csharp.christiannagel.com>

Topics

- Intro
 - Standard Query Operators
 - Expression Trees
-



LINQ Query

- from, select mandatory
- Converts to method invocation

```
var query = from r in Formula1.GetChampions()  
             where r.Country == "Brazil"  
             orderby r.Wins descending  
             select r;
```

Method Syntax

- More Options
- Can be combined

```
var brazilChampions =  
    champions.Where(r => r.Country == "Brazil")  
                .OrderByDescending(r => r.Wins)  
                .Select(r => r);
```



Deferred Query Execution

- `yield` is used behind the scenes
- Queries are executed deferred
- Use `ToArray`, `ToList` to execute it immediately



Standard Query Operators (1)

Operator	Description
Where OfType	Filtering operators
Select SelectMany	Projection operators
OrderBy ThenBy OrderByDescending ThenByDescending Reverse	Sorting operators
Join GroupJoin	Join operators

Standard Query Operators (2)

Operator	Description
GroupBy ToLookup	Grouping operators
Any All Contains	Quantifier operators
Distinct Union Intersect Except Zip	Set operators

Standard Query Operators (3)

Operator	Description
First FirstOrDefault Last LastOrDefault ElementAt ElementAtOrDefault Single SingleOrDefault	Element operators
Count Sum Min Max Average Aggregate	Aggregate operators

Standard Query Operators (4)

Operator	Description
ToArray AsEnumerable ToList ToDictionary Cast	Conversion operators
Empty Range	Generation operators

Expression Trees

- With expressions of type `Expression<T>`, the compiler stores expression trees
- Can be analyzed and converted during runtime
- Used from EF Core to generate T-SQL

Summary

- LINQ Query
- Method Syntax
- Query Operators
- Expression Trees