



& Examples

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LINQ is a cool feature in C# 3.0. Most of the developers are struggling for the syntax and examples. Here I have collected various examples for each operator in LINQ and the equivalent Lambda Expressions.

Where

```
01. IEnumerable<Product> x = products.Where(p => p.UnitPrice >= 10);
02.
03. IEnumerable<Product> x =
04. from p in products
05. where p.UnitPrice >= 10
06. select p;
```

Select

```
01. IEnumerable<string> productNames = products.Select(p => p.Name);
02. IEnumerable<string> productNames = from p in products select p.Name;
03.
04. var namesAndPrices =
05. products.
06. Where(p => p.UnitPrice >= 10).
07. Select(p => new { p.Name, p.UnitPrice }).
08. ToList();
09. IEnumerable<int> indices =
10. products.
11. Select((product, index) => new { product, index }).
12. Where(x => x.product.UnitPrice >= 10).
13. Select(x => x.index);
```

SelectMany

```
01. IEnumerable<Order> orders =
02. customers.
03. Where(c => c.Country == "Denmark").
04. SelectMany(c => c.Orders);
05. var namesAndOrderIDs =
06. customers.
07. Where(c => c.Country == "Denmark").
08. SelectMany(c => c.Orders).
09. Where(o => o.OrderDate.Year == 2005).
10. Select(o => new { o.Customer.Name, o.OrderID });
11. var namesAndOrderIDs =
12. customers.
```

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```

16. Select(co => new { co.c.Name, co.o.OrderID })
17.
18. var namesAndOrderIDs =
19.     from c in customers
20.     where c.Country == "Denmark"
21.     from o in c.Orders
22.     where o.OrderDate.Year == 2005
23.     select new { c.Name, o.OrderID };

```

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Take

```

01. IEnumerable<Product> MostExpensive10 = products.OrderByDescending(p => p.UnitPrice).Take(10);

```

Skip

```

01. IEnumerable<Product> AllButMostExpensive10 = products.OrderByDescending(p => p.UnitPrice).

```

TakeWhile SkipWhile

```

01. s.TakeWhile(p) s.SkipWhile(p)

```

Join

```

01. var custOrders = customers.
02. Join(orders, c => c.CustomerID, o => o.CustomerID, (c, o) => new {
03.     c.Name, o.OrderDate, o.Total
04. });
05. var custOrders = from c in customers
06. join o in orders on c.CustomerID equals o.CustomerID
07. select new {
08.     c.Name, o.OrderDate, o.Total
09. };

```

GroupJoin

```

01. var custTotalOrders = customers.
02. GroupJoin(orders, c => c.CustomerID, o => o.CustomerID, (c, co) => new {
03.     c.Name, TotalOrders = co.Sum(o => o.Total)
04. });
05. var custTotalOrders = from c in customers
06. join o in orders on c.CustomerID equals o.CustomerID into co
07. select new {
08.     c.Name, TotalOrders = co.Sum(o => o.Total)
09. };
10. var custTotalOrders = from c in customers
11. join o in orders on c.CustomerID equals o.CustomerID into co
12. select new {
13.     c.Name, o.OrderDate, o.Total
14. };
15. var custTotalOrders = from c in customers
16. join o in orders on c.CustomerID equals o.CustomerID into co
17. from o in co
18. select new {
19.     c.Name, o.OrderDate, o.Total
20. };
21. var custTotalOrders = from c in customers
22. join o in orders on c.CustomerID equals o.CustomerID into co
23. from o in co.DefaultIfEmpty(emptyOrder)
24. select new {

```

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```

01. IEnumerable < string > locations = customers.Select(c => c.City).
02. Concat(customers.Select(c => c.Region)).
03. Concat(customers.Select(c => c.Country)).
04. Distinct();
05. IEnumerable < string > locations = new [] {
06.     customers.Select(c => c.City),
07.     customers.Select(c => c.Region),
08.     customers.Select(c => c.Country),
09. }.
10. SelectMany(s => s).
11. Distinct();

```

OrderBy / ThenBy

```

01. IEnumerable<Product> orderedProducts1 =
02. products.
03. OrderBy(p => p.Category).
04. ThenByDescending(p => p.UnitPrice).
05. ThenBy(p => p.Name);
06. IEnumerable<Product> orderedProducts1 =
07. from p in products
08. orderby p.Category, p.UnitPrice descending, p.Name
09. select p;
10. IEnumerable<Product> orderedProducts2 =
11. products.
12. Where(p => p.Category == "Beverages").
13. OrderBy(p => p.Name, StringComparer.CurrentCultureIgnoreCase);
14. IEnumerable<string> orderedProductNames =
15. products.
16. Where(p => p.Category == "Beverages").
17. Select(p => p.Name).
18. OrderBy(x => x);

```

GroupBy

```

IGrouping<string, Product>> productsByCategory =products.GroupBy(p => p.Category);
IGrouping<string, string>> productNamesByCategory =products.GroupBy(p => p.Category, p => p.Name);

```

Distinct

```

01. IEnumerable<string> productCategories =products.Select(p => p.Category).Distinct();

```

AsEnumerable

```

01. Table<Customer> custTable = GetCustomersTable();
02. var query = custTable.AsEnumerable().Where(c =>

```

ToArray

```

01. string[] customerCountries =customers.Select(c =>

```

ToList

```

01. List<Customer> customersWithOrdersIn2005 =customers.
02. Where(c => c.Orders.Any(o => o.OrderDate.Year == 2005)).
03. ToList();

```

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```
01. Dictionary<int, Order> orders = customers.
02. SelectMany(c => c.Orders).
    Where(o => o.OrderDate.Year == 2005).
04. ToDictionary(o => o.OrderID);
05. Dictionary<string, decimal> categoryMaxPrice = products.
06. GroupBy(p => p.Category).
07. ToDictionary(g => g.Key, g => g.Group.Max(p => p.UnitPrice));
```

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ToLookup

```
01. Lookup<string, Product> productsByCategory = products.ToLookup(p => p.Category);
02. IEnumerable<Product> beverages = productsByCategory["Beverage"];
```

OfType

```
01. List<Person> persons = GetListOfPersons();
02. IEnumerable<Employee> employees = persons.OfType<Employee>();
```

Cast

```
01. ArrayList objects = GetOrders();
02. IEnumerable<Order> ordersIn2005 =
03. objects.
04. Cast<Order>().
05. Where(o => o.OrderDate.Year == 2005);
06. ArrayList objects = GetOrders();
07. IEnumerable<Order> ordersIn2005 =
08. from Order o in objects
09. where o.OrderDate.Year == 2005
10. select o;
```

First

```
01. string phone = "206-555-1212";
02. Customer c = customers.First(c => c.Phone == phone);
```

Single

```
01. int id=12345;
02. Customer c = customers.Single(c => c.CustomerID == id);
```

ElementAt

```
01. Product thirdMostExpensive = products.OrderByDescending(p => p.UnitPrice).ElementAt(2);
```

Range

```
01. int[] squares = Enumerable.Range(0, 100).Select
```

Repeat

```
01. long[] x = Enumerable.Repeat(-1L, 256).ToArray()
```

Empty

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```
01. bool b = products.Any(p => p.UnitPrice >= 100 && p.UnitsInStock == 0);
```

All

```
01. IEnumerable<string> fullyStockedCategories = products.
02. GroupBy(p => p.Category).
03. Where(g => g.Group.All(p => p.UnitsInStock > 0)).
04. Select(g => g.Key);
```

Count

```
01. int count = customers.Count(c => c.City == "London");
```

Sum

```
01. int year = 2005;
02. var namesAndTotals = customers.
03. Select(c => new {
04.     c.Name,
05.     TotalOrders = c.Orders.
06.     Where(o => o.OrderDate.Year == year).
07.     Sum(o => o.Total)
08. });
```

Min

```
01. var minPriceByCategory = products.
02. GroupBy(p => p.Category).
03. Select(g => new {
04.     Category = g.Key,
05.     MinPrice = g.Group.Min(p => p.UnitPrice)
06. });
```

Max

```
01. decimal largestOrder = customers.
02. SelectMany(c => c.Orders).
03. Where(o => o.OrderDate.Year == 2005).
04. Max(o => o.Total);
```

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```
01. var averageOrderTotals = customers.
02. Select(c => new {
03.     c.Name,
04.     AverageOrderTotal = c.Orders.Average(o => o.Total)
05. });
```

Aggregate

```
01. var longestNamesByCategory = products.
02. GroupBy(p => p.Category).
03. Select(g => new {
04.     Category = g.Key,
05.     LongestName = g.Group.
06.     Select(p => p.Name).
07.     Aggregate((s, t) => t.Length > s.Length ? t : s)
```

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good one thanks

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great work..really helpful for the new developers.Thanks

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Nice and practical approach :)



C#Corner

Great, Thanks

Farooq Md

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