(T3)討論 LinqToObject 的 Where
CourseGUID: 5ba9a6fe-7475-4b0c-8b99-bbcf7f5e2e1c
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0. Summary

1.
Where
1.1.
Where is a Linq query operator which
contains a predicate condition to filter the data,
just like the WHERE keyword in TSQL.
A predicate is a function to test each element for a condition.
The where query operator is optional.
1.2.
Enumerable.Where<TSource>(this IEnumerable<TSource> source, Func<TSource, Boolean> filter)
Reference:
https://msdn.microsoft.com/en-us/library/bb534803(v=vs.110).aspx
Filters a sequence of values based on a predicate.
1.3.
Enumerable.Where<TSource>(this IEnumerable<TSource> source, Func<TSource, Int32, Boolean> filter)
Reference:
https://msdn.microsoft.com/en-us/library/bb534647(v=vs.110).aspx
Filters a sequence of values based on a predicate
which has its source and source index as input.
predicate here is a function to test each source element for a condition.
The second parameter of the function represents the index of the source element.
Each element's index is used in the logic of the predicate function.

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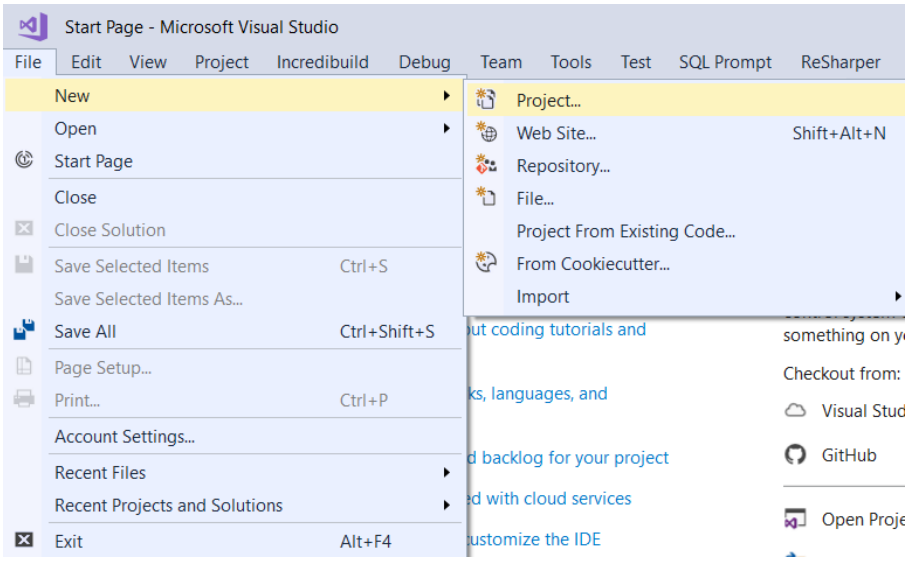
1. New Project

1.1. Create New Project : Sample

File --> New --> Project... -->

Visual C# --> **Console App (.Net Framework)** -->

Name: **Sample**


Start Page - Microsoft Visual Studio
File Edit View Project Incredibuild Debug Team Tools Test SQL Prompt ReSharper
New
Open
Start Page
Close
Close Solution
Save Selected Items Ctrl+S
Save Selected Items As...
Save All Ctrl+Shift+S
Page Setup...
Print... Ctrl+P
Account Settings...
Recent Files
Recent Projects and Solutions
Exit Alt+F4
Project...
Web Site... Shift+Alt+N
Repository...
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Project From Existing Code...
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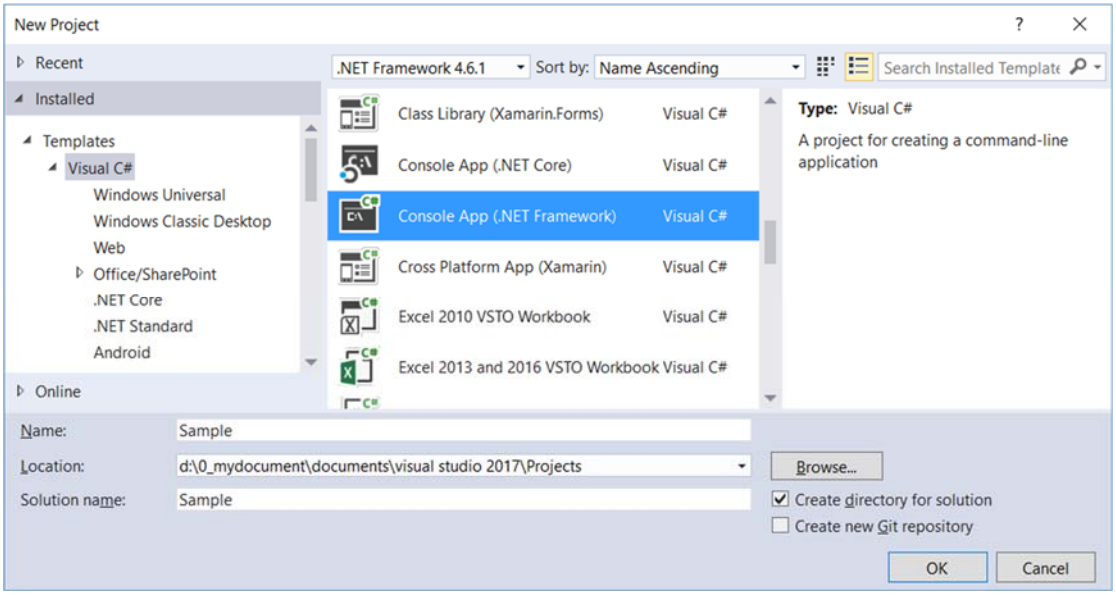
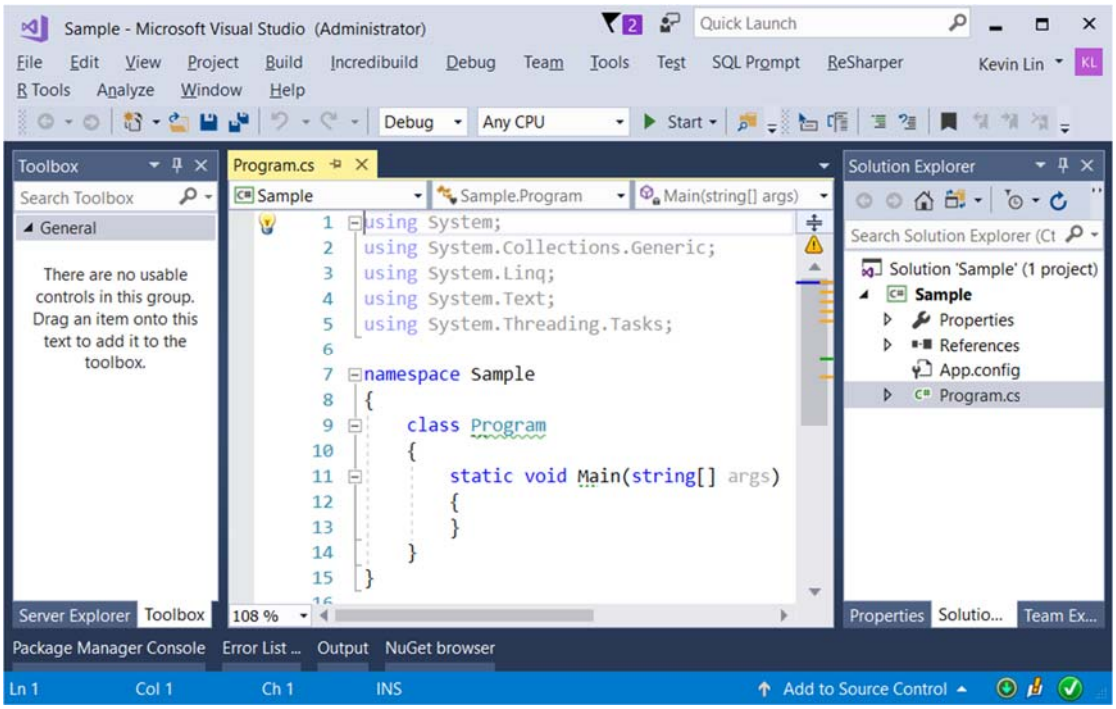

New Project
Recent
Installed
Templates
Visual C#
Windows Universal
Windows Classic Desktop
Web
Office/SharePoint
.NET Core
.NET Standard
Android
Online
.NET Framework 4.6.1
Sort by: Name Ascending
Search Installed Templat
Class Library (Xamarin.Forms) Visual C#
Console App (.NET Core) Visual C#
Console App (.NET Framework) Visual C#
Cross Platform App (Xamarin) Visual C#
Excel 2010 VSTO Workbook Visual C#
Excel 2013 and 2016 VSTO Workbook Visual C#
Type: Visual C#
A project for creating a command-line application
Name: Sample
Location: d:\0_mydocument\documents\visual studio 2017\Projects
Solution name: Sample
Browse...
Create directory for solution
Create new Git repository
OK
Cancel


Sample - Microsoft Visual Studio (Administrator)
Quick Launch
File Edit View Project Build Incredibuild Debug Team Tools Test SQL Prompt ReSharper
R Tools Analyze Window Help
Kevin Lin
Debug
Any CPU
Start
Toolbox
Search Toolbox
General
There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.
Program.cs
Sample
Sample.Program
Main(string[] args)
using System;
using System.Collections.Generic;
using System.Linq;
using System.Text;
using System.Threading.Tasks;
namespace Sample
{
class Program
{
static void Main(string[] args)
{
}
}
}
Solution Explorer
Search Solution Explorer (Ct
Solution 'Sample' (1 project)
Sample
Properties
References
App.config
Program.cs
Server Explorer
Toolbox
108 %
Properties
Solutio...
Team Ex...
Package Manager Console
Error List ...
Output
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Add to Source Control

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2. Sample : Program.cs

```
using System;
using System.Collections.Generic;
using System.Linq;
namespace Sample
{
    class Program
    {
        static void Main(string[] args)
        {
            // 1. ================================================
            //Enumerable.Where<TSource>(this
 IEnumerable<TSource> source, Func<TSource, Boolean> filter)
            Console.WriteLine("1. WhereSample1 ================== ");
             WhereSample1();
            // 2. ================================================
            //Enumerable.Where<TSource>(this
 IEnumerable<TSource> source, Func<TSource, Int32, Boolean> filter)
            Console.WriteLine("2. WhereSample2 ================== ");
             WhereSample2();
            Console.ReadLine();
        }
        // 1. ================================================
        //Enumerable.Where<TSource>(this
IEnumerable<TSource> source, Func<TSource, Boolean> filter)
        //Reference:
        //https://msdn.microsoft.com/en-us/library/bb534803(v=vs.110).aspx
        //Filters a sequence of values based on a predicate.
        static void WhereSample1()
        {
            List<int> intList =
                new List<int> { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 };
            //1.1. intList.Where(num => IsOdd(num)); ---------
            Console.WriteLine("1.1. intList.Where(num => IsOdd(num)); --------- ");
            IEnumerable<int> intOddV1 =
                 intList.Where(num => IsOdd(num));
            foreach (int intOddV1Item in intOddV1)
            {
                Console.WriteLine(intOddV1Item);
            }
            //1.2. intList.Where(num => IsOdd(num)); ---------
            Console.WriteLine("1.2. intList.Where(IsOdd); --------- ");
            IEnumerable<int> intOddV2 = intList.Where(IsOdd);
            foreach (int intOddV2Item in intOddV2)
            {
                Console.WriteLine(intOddV2Item);
            }
            //1.3. intList.Where(num => IsOdd(num)); ---------
            Console.WriteLine("1.3. intList.Where(i => i % 2 != 0) --------- ");
            IEnumerable<int> intOddV3 = intList.Where(i => i % 2 != 0);
            foreach (int intOddV3Item in intOddV3)
```

```
            {
                Console.WriteLine(intOddV3Item);
            }
        }
        static bool IsOdd(int i)
        {
            return i % 2 != 0;
        }
        //1. WhereSample1 ==================
        //1
        //3
        //5
        //7
        //9
        // 2. ================================================
        //Enumerable.Where<TSource>(this
 IEnumerable<TSource> source, Func<TSource, Int32, Boolean> filter)
        //Reference:
        //https://msdn.microsoft.com/en-us/library/bb534647(v=vs.110).aspx
        //Filters a sequence of values based on a predicate
        //which has its source and source index as input.
        //predicate here is a function to test each source element for a condition.
        //The second parameter of the function represents the index of the source element.
        //Each element's index is used in the logic of the predicate function.
        static void WhereSample2()
        {
            List<int> intList = new List<int> { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 };
            //2.1. Get Odd Number and Index ---------
            Console.WriteLine("2.1. Get Odd Number and Index --------- ");
            IEnumerable<string> oddIntAndIndexStrs = intList.Select((intNumber, index)
=> $"intNumber:{intNumber},index:{index}" );
            foreach (string oddIntAndIndexStrsItem in oddIntAndIndexStrs)
            {
                Console.WriteLine(oddIntAndIndexStrsItem);
            }
            //intNumber: 1,index: 0
            //intNumber: 2,index: 1
            //intNumber: 3,index: 2
            //intNumber: 4,index: 3
            //intNumber: 5,index: 4
            //intNumber: 6,index: 5
            //intNumber: 7,index: 6
            //intNumber: 8,index: 7
            //intNumber: 9,index: 8
            //intNumber: 10,index: 9
            //2.2. Get Odd Index ---------
            Console.WriteLine("2.2. Get Odd Index --------- ");
            IEnumerable<int> oddIndexes = intList
                 .Select((num, index) => new { Number = num, Index = index })
                 .Where(anonymousObject => anonymousObject.Number % 2 != 0)
                 .Select(anonymousObject => anonymousObject.Index);
            foreach (int oddIndexesItem in oddIndexes)
            {
                Console.WriteLine($"oddIndexesItem : {oddIndexesItem}");
            }
            //oddIndexesItem : 0
```

```
            //oddIndexesItem : 2
            //oddIndexesItem : 4
            //oddIndexesItem : 6
            //oddIndexesItem : 8
        }
    }
}
```

```
1. WhereSample1 ==================
1.1. intList.Where(num => IsOdd(num)); ---------
1
3
5
7
9
1.2. intList.Where(IsOdd); ---------
1
3
5
7
9
1.3. intList.Where(i => i % 2 != 0) ---------
1
3
5
7
9
```

```
2. WhereSample2 ====================
2.1. Get Odd Number and Index ---------
intNumber:1,index:0
intNumber:2,index:1
intNumber:3,index:2
intNumber:4,index:3
intNumber:5,index:4
intNumber:6,index:5
intNumber:7,index:6
intNumber:8,index:7
intNumber:9,index:8
intNumber:10,index:9
2.2. Get Odd Index ---------
oddIndexesItem : 0
oddIndexesItem : 2
oddIndexesItem : 4
oddIndexesItem : 6
oddIndexesItem : 8
```