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Part 5 - Aggregate function in LINQ

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Part 4 - LINQ Aggregate Functions

In this video we will discuss the use of **Aggregate**() LINQ function. In Part 4 of LINQ Tutorial, we discussed the following functions.
Min
Max
Sum
Count
Average

Let us understand the use of **Aggregate**() function with examples.

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Example 1: Consider the following string array.

```
string[] countries = { "India", "US", "UK", "Canada", "Australia" };
```

We want to combine all these strings into a single comma separated string. The output of the program should be as shown below.
India, US, UK, Canada, Australia

Without LINQ, the program will be as shown below.

```
using System;
namespace Demo
{
   class Program
   {
      static void Main()
      {
         string[] countries = { "India", "US", "UK", "Canada", "Australia" };

         string result = string.Empty;
         for (int i = 0; i < countries.Length; i++)
         {
            result = result + countries[i] + ", ";
         }

         int lastIndex = result.LastIndexOf(",");
         result = result.Remove(lastIndex);

         Console.WriteLine(result);
      }
   }
}
```

With LINQ Aggregate function

```
using System;
using System.Linq;
namespace Demo
{
   class Program
   {
      static void Main()
      {
         string[] countries = { "India", "US", "UK", "Canada", "Australia" };

         string result = countries.Aggregate((a, b) => a + ", " + b);

         Console.WriteLine(result);
      }
   }
}
```

How Aggregate() function works?
Step 1. First **"India"** is concatenated with **"US"** to produce result **"India, US"**
Step 2. Result in **Step 1** is then concatenated with **"UK"** to produce result **"India, US, UK"**
Step 3: Result in **Step 2** is then concatenated with **"Canada"** to produce result **"India, US, UK, Canada"**

This goes on until the last element in the array to produce the final single string **"India, US, UK, Canada, Australia"**

Example 2: Consider the following integer array

```
int[] Numbers = { 2, 3, 4, 5 };
```

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Compute the product of all numbers

Without LINQ

```
using System;
namespace Demo
{
   class Program
   {
      static void Main()
      {
         int[] Numbers = { 2, 3, 4, 5 };

         int result = 1;
         foreach (int i in Numbers)
         {
            result = result * i;
         }

         Console.WriteLine(result);
      }
   }
}
```

With LINQ:

```
using System;
using System.Linq;
namespace Demo
{
   class Program
   {
      static void Main()
      {
         int[] Numbers = { 2, 3, 4, 5 };

         int result = Numbers.Aggregate((a, b) => a * b);

         Console.WriteLine(result);
      }
   }
}
```

How Aggregate() function works?
Step 1: Multiply **(2X3)** to produce result **6**
Step 2: Result **(6)** in **Step 1** is then multiplied with **4 (6X4)** to produce result **24**
Step 3: Result **(24)** in **Step 2** is then multiplied with **5 (24X5)** to produce final result **120**

Example 3: Consider the following integer array

```
int[] Numbers = { 2, 3, 4, 5 };
```

One of the overloaded version of **Aggregate()** function has a **Seed** parameter. If we pass **10** as the value for Seed parameter

```
int result = Numbers.Aggregate(10, (a, b) => a * b);
```

1200 will be the result

Step 1: Multiply **(10X2)** to produce result **20**
Step 2: Result **(20)** in **Step 1** is then multiplied with **3 (20X3)** to produce result **60**
Step 3: Result **(60)** in **Step 2** is then multiplied with **4 (60X4)** to produce result **240**
Step 4: Result **(240)** in **Step 3** is then multiplied with **5 (240X5)** to produce final result **1200**

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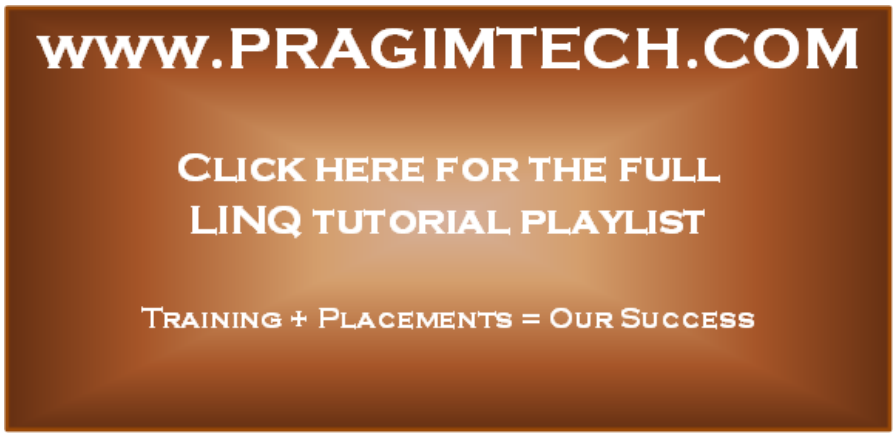

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Ahmet Toka July 22, 2014 at 5:50 PM

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