2 April 2018

CECS 424 Spring 2018

Assignment 4

Homework 4

1. Download and install an IDE for C# for your platform, e.g. Visual Studio, MonoDevelop, or Xamarin Studio.
2. Take “A Tour of the C# Language”: https://docs.microsoft.com/en-us/dotnet/articles/csharp/tour-of-csharp
3. Read the “Introduction to LINQ Queries (C#)”: https://docs.microsoft.com/en-us/dotnet/articles/csharp/programming-guide/concepts/linq/introduction-to-linq-queries
4. Get a LINQ cheat sheet, e.g. the one that I shared in the Lecture Notes Repository.

Lab Assignment 4

Overview

In this lab, you will use C# and LINQ to iterate files, to query, group and order data, and to create an XML document based on that data.

Implementation

You must follow these implementation guidelines:

1. Create a C# console application.
   This application has two command line arguments: A path to a folder and a name for a HTML report output file. The application collects all files with the same extension (converted to lower case) and determines for each extension, i.e. file type, the number of files and the total size of all files of this type.

2. Implement a class with the following 4 static functions:

   `static IEnumerable<string> EnumerateFilesRecursively(string path)`
   Enumerate all files in a given folder recursively including the entire sub-folder hierarchy. You can use **`System.IO.Directory`**. Use the generator pattern (**`yield`** keyword) to implement the iterator.

   `static string FormatByteSize(long byteSize)`
   Format a byte size in human readable form. Use the following units: B, kB, MB, GB, TB, PB, EB, and ZB where 1kB = 1000B. The numerical value should be greater or equal to 1, less than 1000 and formatted with 2 fixed digits after the decimal point, e.g. **`1.30kB`**.

`static XDocument CreateReport(IEnumerable<string> files)`
Create a HTML document containing a table with three columns: “Type”, “Count”, and “Size” for the file name extension (converted to lower case), the number of files with this type, and the total size of all files with this type, respectively.
You can use **`System.IO.FileInfo`** to get the size of a file with a given path.
Sort the table by the byte size value of the “Size” column in descending order.
Use your **`FormatByteSize`** function to format the value printed in the “Size” column.
Implement this function using LINQ queries making use of **`group by`** and **`orderby`**.
Use the **`System.Xml.Linq.XElement`** constructor to functionally construct the XML document.

`public static void Main(string[] args)`
Take two command line arguments. The first value is the path of the input folder and the second the path of the HTML report output file. Call the functions above to create the report file.

Testing Your Code

Demonstrate that your console application works by creating a report file from some folder on your machine.

Deliverable: A private git repository named "**CECS 424 Spring 2018 Assignment 4**" with me (and only me, **https://bitbucket.org/Gedankenexperiment**) added as a reader, that contains all your C# source code as described above and an example HTML report file generated by your console application. ***Due date:*** Wednesday 23 April 2018 at the beginning of lecture.