CTU training solutions

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Question 1

1.1 Write a program in LINQ and C# Sharp to find the string which starts and ends with a specific character.

Tasks to complete:

• You are to use an array that will contain 10 South African cities – You are required to use cities provided below: Test data: Butterworth, Mthatha, Jagersfontein, Kroonstad, Boksburg, Soweto, Empangeni, Polokwane, Secunda, Kuruman.

```
0 references
class LinqExercise
{
    0 references
    static void Main(string[] args)
    {
        string chst, chen;
        char ch;
        //1D array of the ten different cities
        string[] cities =
        {
                "Butterworth", "Mthatha", "Jagersfontein", "Kroonstad", "Boksburg", "Soweto", "Empangeni", "Polokwane", "Secunda", "Kuruman"
            };
```

• Have a welcome message to your users that will help them know your application

```
    };

    //Welcome message to the users that will help them know the application
    Console.Write("\nWelcome to LINQ : This is a program that allows you to find the string which starts and ends with a specific character : ");
    Console.Write("\n------------------------------------------------------------------\n");
```

• Display all cities available

```
    Console.Write("\n------------------------------------------------------------------\n");
    //Displays all cities available
    Console.Write("\nThe cities are :  'Butterworth', 'Mthatha', 'Jagersfontein', 'Kroonstad', 'Boksburg', 'Soweto', 'Empangeni', 'Polokwane', 'Sec

    //Prompts the user to enter a starting character for a city
```

• Prompt the user to enter a starting character for a city

```
//Prompts the user to enter a starting character for a city
Console.Write("\nInput starting character for the string : ");
ch = (char)Console.Read();
chst = ch.ToString();
```

• Prompt the user to enter an ending string character for a city

```
    //Prompts the user to enter an ending string character for a city
    Console.Write("\nInput ending character for the string : ");
    ch = (char)Console.Read();
    chen = ch.ToString();
```

• Your output should be based on the starting and ending string character

```
var _result = from x in cities
              where x.StartsWith(chst)
              where x.EndsWith(chen)
              select x;
Console.Write("\n\n");
foreach (var city in _result)
{
    Console.Write("The city starting with {0} and ending with {1} is : {2} \n", chst, chen, city);
}

Console.ReadLine();
```

Question 2

1. Write a LINQ query that retrieves the names of all the students who have at least one grade greater than or equal to 90. [5 Marks]

```
    Console.ReadKey();
}

// Create the query.
// The first line could also be written as "var studentQuery ="
IEnumerable<Student> studentQuery =
    from Student in students
    where Student.Scores[0] > 90
    select Student;
```

2. Write a LINQ query that calculates the average grade of all the students in each course and returns a list of anonymous objects with the course name and the average grade. [5 Marks]

3. Write a LINQ query that retrieves the names of all the courses where all the students have at least one grade greater than or equal to 80. [5 Marks]

```
// Create the query.
IEnumerable<Student> studentQuery =
    from Student in students
    where Student.Scores[0] => 80
    select Student;
}
```

4. Write a LINQ query that retrieves the name and age of the student with the highest average grade across all the courses. [5]

```
class HighestGrade
{
    0 references
    static void Main(string[] args)
    {
        Student e = new Student();


        Console.Write("\nLINQ : Find the nth Maximum Grade Point achieved by the students from the list of student : ");
        Console.Write("\n-------------------------------------------------------------------------------------------\n");

        Console.Write("Which maximum grade point(1st, 2nd, 3rd, ...) you want to find  : ");
        int grPointRank = Convert.ToInt32(Console.ReadLine());
        Console.Write("\n");
        var stulist = e.GtStuRec();
        var students = (from stuMast in stulist
                        group stuMast by stuMast.GrPoint into g
                        orderby g.Key descending
                        select new
                        {
                            StuRecord = g.ToList()
                        }).ToList();

        students[grPointRank - 1].StuRecord
            .ForEach(i => Console.WriteLine(" Id : {0},  Name : {1},  achieved Grade Point : {2}", i.StuId, i.StuName, i.GrPoint));

        Console.ReadKey();
```

Completed Declaration of Authenticity

I Gabriella Rakgotsoka _ hereby

(FULL NAME)

declare that the contents of this assignment PRG521_FA2 is entirely my own work except for the following documents: (List the documents and page numbers of work in this portfolio
that were generated in a group)

Activity	Date

Signature: Date: 2022/09/15