Programming Exercise 12a
LINQ Exercises

C# Step by Step

For each part, write a LINQ query that prints the results of the query evaluation.

1 Print the even numbers in a list — 10 pts

Given the integer array shown below, write a query that prints the even numbers.

```
int[] n1 = int { 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 };
```

You should produce the following as output.

```
The numbers which produce the remainder 0 after divided by 2 are :
0 2 4 6 8
```

2 Print the positive numbers in a list — 20 pts

Given the integer array shown below write a query that prints the positive numbers greater than 0 and less than 12.

```
int[] n2 = {  1, 3, -2, -4, -7, -3, -8, 12, 19, 6, 9, 10, 14  };
```

You should produce the following as output.

```
The numbers within the range of 1 to 11 are :
1  3  6  9  10
```

3 Print the squares over 20 — 30 pts

Given the list below print all the integers and their squares where the square of the integer is greater than 20. For example, this will ot include 4 (square is 16) but will include 5 (square is 25).

```
var arr1 = new[] { 3, 9, 2, 8, 6, 5 };
```

You should produce the following as output.

```
{ Number = 9, SqrNo = 81 }
{ Number = 8, SqrNo = 64 }
{ Number = 6, SqrNo = 36 }
{ Number = 5, SqrNo = 25 }
```

4 Number of times a digit appears — 40 pts

Given the list below print a report listing each digit and the number of times that digit appears in the list.

```
int[] arr1 = new int[] { 5, 9, 1, 2, 3, 7, 5, 6, 7, 3, 7, 6, 8, 5, 4, 9, 6, 2 };
```

You should produce the following as output.

```
Number 5 appears 3 times
Number 9 appears 2 times
Number 1 appears 1 times
Number 2 appears 2 times
Number 3 appears 2 times
Number 7 appears 3 times
Number 6 appears 3 times
Number 8 appears 1 times
Number 4 appears 1 times
```

5 Count the number of seperate characters in a string — 50 pts

Request the user to enter a string and then print a report showing each character in the string and the number of times that character appears. Your output should be as follows.

```
Input the string : Hello, I am a string. How do you like me?

The frequency of the characters are :
Character H: 2 times
Character e: 3 times
Character l: 3 times
Character o: 4 times
Character ,: 1 times
Character  : 9 times
Character I: 1 times
Character a: 2 times
Character m: 2 times
Character s: 1 times
Character t: 1 times
Character r: 1 times
Character i: 2 times
Character n: 1 times
Character g: 1 times
Character .: 1 times
Character w: 1 times
Character d: 1 times
Character y: 1 times
Character u: 1 times
Character k: 1 times
Character ?: 1 times
```

6 Print the days of the week — 60 pts

Given an input string like the one below, write a LINQ query that prints each item on a separate line.

```
string[] dayWeek = { "Sunday", "Monday", "Tuesday", "Wednesday", "Thursday", "Friday", "Saturday" };
```

Your output should be as follows:

```
Sunday
Monday
Tuesday
Wednesday
Thursday
Friday
Saturday
```

7 Display digit, frequency, and digit ties frequency — 70 pts

Given the following array, print a report listing each digit, the frequency of each digit, and the digit timmes the frequency.

```
int[] nums = new int[] { 5, 1, 9, 2, 3, 7, 4, 5, 6, 8, 7, 6, 3, 4, 5, 2 };
```

Your output show look like this:

```
Number  Number*Frequency        Frequency
-----------------------------------------------
5       3                       15
1       1                       1
9       1                       9
2       2                       4
3       2                       6
7       2                       14
4       2                       8
6       2                       12
8       1                       8
```

8 Beginning and ending characters — 80 pts

Given the following string array, write a routine that requests the use to enter a beginning and an ending character, and then prints the nae of the city that matches.

```
string[] cities =
{ "ROME","LONDON","NAIROBI","CALIFORNIA","ZURICH","NEW DELHI","AMSTERDAM","ABU DHABI", "PARIS" }
```

Your output should look like this:

```
The cities are:
ROME,LONDON,NAIROBI,CALIFORNIA,ZURICH,NEW DELHI,AMSTERDAM,ABU DHABI,PARIS

Input starting character for the string : C

Input ending character for the string : A

The city starting with C and ending with A is : CALIFORNIA
```

9 Create list and print larger values — 90 pts

Write a routine that accepts an integer as the size of a list of numbers, accepts that number of entries, requests the user to enter a value, and prints the values in the list that are greater than the value enteered by the user. Your output should look like this.

```
Input the number of members on the List : 5
Member 0 : 23
Member 1 : 54
Member 2 : 65
Member 3 : 77
Member 4 : 35

Input the value above you want to display the members of the List : 35

The numbers greater than 35 are :
54
65
77
```

10 Using a generic list — 100 pts

Create a generic list of integers. Ask the user to enter an integer (n) and print out the n largest integers from the list. Your output should look like this:

```
The members of the list are :
5
7
13
24
6
9
8
7
How many records you want to display ? : 4
The top 4 records from the list are :
24
13
9
8
```