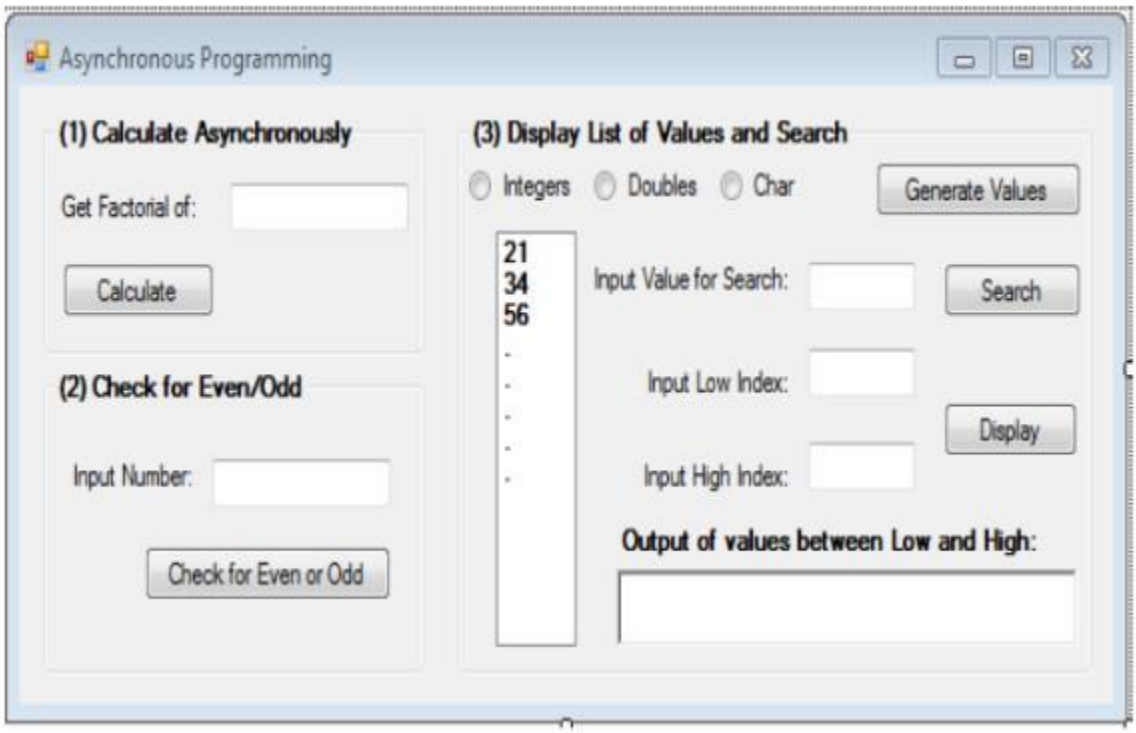
Asynchronous Programming Application

Use of Windows Form

a) Create a **Windows Form App/WPF** to as shown in the screenshot.



b) For the first group box – Calculate Asynchronously, you would be creating a method –> long **Factorial** (long num) which is being called asynchronously (defined by the use of async, await and Task objects) in the event handler of **Calculate** button. You would be writing recursive version of Factorial. Also you need to validate all the input values and handling of all the possible exceptions. *[5 marks]*

c) For the second group box – Check for Even/Odd, you would be creating a two methods (by demonstrating the use of delegates and Lambda expression) - **IsEven** and **IsOdd** which takes an integer as input and return the true/false, and calling and using these methods in the event handler of **Check for Even or Odd** button. Also you need to validate all the input values and handling of all the possible exceptions. *[5 marks]*

d) For the third group box – Display List of Values and Search, implement the following: *[5 marks]*

i) **Generate Values** button should generate 10 values (between 10 and 99 and by making use of Random number generator) depending upon the selected radio button choice. Use list box control to display the generated values as shown in the screen shot.

ii) **Search** button should be able to search correctly an input value from the list of values in the listbox. Make use of Message Box to display the result. You need to define a generic search method – **SearchData** which takes a generic list<T> and value to be searched as inputs and returns boolean. You would be calling this method in the Search button event handler. Also you need to validate all the input values and handling of all the possible exceptions.

iii) **Display** button should display the range of values between the valid index values from the list of values in the listbox. You need to define a generic display method –

Note: *Your Display button event handler will be* ***buttonDisplay_Click()*** *{ ….} .*
In this event handler, you can call generic method – ***Display****(int lowIndex, int highIndex) { ….}*
And in the body of Display, your code should be able to print all the three types of lists- int, double or char.