Lab Assignment #9

HP1 Implement the Code in C# to Display the index of a searched item from an array using Delegates.

```
using System;

namespace HP
{
   delegate int IndexDisplay(int[] a,int x);
   class Program
   {
      public static int FindIndex(int[] arr,int x) {
         for(int i=0;i<arr.Length;i++)
         {
            if(arr[i]==x)
               return i;
         }
         return -1;
      }
      static void Main(string[] args)
      {
         int[] a=new int[10];
         Console.WriteLine("Enter size of Array:");
         int n=Convert.ToInt32(Console.ReadLine());
         Console.WriteLine("Enter {0} Elements:",n);
         for(int i=0;i<n;i++)
            a[i]=Convert.ToInt32(Console.ReadLine());
         IndexDisplay index = new IndexDisplay(FindIndex);
         Console.WriteLine("Enter Element to be Searched:");
         int x=Convert.ToInt32(Console.ReadLine());
         Console.WriteLine(index(a,x)==-1?
         "Element Not Found":"Element Present at Index: "+index(a,x));
      }
   }
}
```

OUTPUT

```
PS C:\Users\user\Desktop\SEM-3\C#\C-sharp programs\HP1> dotnet run
Enter size of Array:
5
Enter 5 Elements:
3
2
4
5
6
Enter Element to be Searched:
6
Element Present at Index: 4
PS C:\Users\user\Desktop\SEM-3\C#\C-sharp programs\HP1>
```

HP2 Implement the Code in C# to display the elements of an array using Delegates.

```
using System;

namespace HP
{
   delegate void DisplayArray(int[] a);
   class Program
   {
      public static void PrintArray(int[] a) {
         Console.WriteLine("Elements: ");
         foreach(int i in a)
            Console.Write(i+" ");
      }
      static void Main(string[] args)
      {
         Console.WriteLine("Enter size of Array:");
         int n=Convert.ToInt32(Console.ReadLine());
         Console.WriteLine("Enter {0} Elements:",n);
         int[] a=new int[n];
         for(int i=0;i<n;i++)
            a[i]=Convert.ToInt32(Console.ReadLine());
         DisplayArray arr = new DisplayArray(PrintArray);
         arr(a);
      }
   }
}
```

OUTPUT

```
PS C:\Users\user\Desktop\SEM-3\C#\C-sharp programs\HP2> dotnet run
Enter size of Array:
5
Enter 5 Elements:
4
3
5
6
7
Elements:
4 3 5 6 7
```

HP3 Implement the Code in C# to demonstrate the to Combine Two Delegates method in HP 1 and HP 2.

```
using System;

namespace HP3
{
   delegate int DelegateArray(int[] a);
   class Program
   {
      public static int FindIndex(int[] arr) {
         Console.WriteLine("\nEnter Element to be Searched:");
         int x=Convert.ToInt32(Console.ReadLine());
         for(int i=0;i<arr.Length;i++)
         {
            if(arr[i]==x)
               return i;
         }
         return -1;
      }

      public static int PrintArray(int[] a) {
         Console.WriteLine("Elements: ");
         foreach(int i in a)
            Console.Write(i+" ");
         return 0;
      }
      static void Main(string[] args)
      {
         Console.WriteLine("Enter size of Array:");
         int n=Convert.ToInt32(Console.ReadLine());
         Console.WriteLine("Enter {0} Elements:",n);
         int[] a=new int[n];
         for(int i=0;i<n;i++)
            a[i]=Convert.ToInt32(Console.ReadLine());
         DelegateArray delPrint,delFindIndex,delResult;
         delPrint=PrintArray;
```

```
        delFindIndex=FindIndex;
        delResult=delPrint+delFindIndex;
        int index=delResult(a);
        Console.WriteLine(index==-1?
        "Element Not Found":"Element Present at Index: "+index);
    }
  }
}
```

OUTPUT

```
PS C:\Users\user\Desktop\SEM-3\C#\C-sharp programs\HP2> dotnet run
Enter size of Array:
5
Enter 5 Elements:
5
7
8
9
4
Elements:
5 7 8 9 4
Enter Element to be Searched:
4
Element Present at Index: 4
PS C:\Users\user\Desktop\SEM-3\C#\C-sharp programs\HP2>
```

HP4 Implement the Code in C# to sort and display the elements of an array (use Bubble Sort Algorithm) using Anonymous Method.

```
using System;

namespace HP
{
  delegate void DelegateArray(int[] a);
  delegate int[] DelegateSortArray(int[] a);
  class Program
  {
    public static void PrintArray(int[] a) {
      foreach(int i in a)
        Console.Write(i+" ");
    }
    public static void SortArray(int[] a) {
      int[] b=new int[a.Length];
      Console.WriteLine("\nElements After Sorting: ");
      DelegateSortArray sort= delegate(int[] a) {
```

```
                for(int i=0;i<a.Length-1;i++){
                for(int j=0;j<a.Length-1-i;j++){
                    if(a[j]>a[j+1]){
                        int temp=a[j];
                        a[j]=a[j+1];
                        a[j+1]=temp;
                    }
                }
            }
            return a;
        };
        b=sort(a);
        foreach(int i in b)
            Console.Write(i+" ");
    }
    static void Main(string[] args)
    {
        Console.WriteLine("Enter size of Array:");
        int n=Convert.ToInt32(Console.ReadLine());
        Console.WriteLine("Enter {0} Elements:",n);
        int[] a=new int[n];
        for(int i=0;i<n;i++)
            a[i]=Convert.ToInt32(Console.ReadLine());
        DelegateArray arr = new DelegateArray(PrintArray);
        Console.WriteLine("Elements Before Sorting: ");
        arr(a);
        arr= SortArray;
        arr(a);
    }
  }
}
```

OUTPUT

```
PS C:\Users\user\Desktop\SEM-3\C#\C-sharp programs\HP2> dotnet run
Enter size of Array:
5
Enter 5 Elements:
3
2
6
4
1
Elements Before Sorting:
3 2 6 4 1
Elements After Sorting:
1 2 3 4 6
PS C:\Users\user\Desktop\SEM-3\C#\C-sharp programs\HP2>
```

HP5 Implement the Code in C# to search an Item from an array using Lambda Expression. The array and Lambda are in distinct class. Lambda Expression return the value either true/false.

```
using System;

namespace HP
{
   delegate bool IndexDisplay(int[] a,int x);
   delegate void DelegateArray(int[] a,int x);
   class Array{
      public static void FindElement(int[] arr,int x) {

         IndexDisplay index=(arr,x) =>
         {
            for(int i=0;i<arr.Length;i++)
            {
               if(arr[i]==x)
                  return true;
            }
            return false;
         };
      Console.WriteLine(index(arr,x)==false ?"Element Not Found":"Element Found");
      }
   }
   class Program
   {
      static void Main(string[] args)
      {
         int[] a=new int[10];
         Console.WriteLine("Enter size of Array:");
         int n=Convert.ToInt32(Console.ReadLine());
         Console.WriteLine("Enter {0} Elements:",n);
```

```
        for(int i=0;i<n;i++)
            a[i]=Convert.ToInt32(Console.ReadLine());
        Console.WriteLine("Enter Element to be Searched:");
        int x=Convert.ToInt32(Console.ReadLine());
        DelegateArray delegateArray=new DelegateArray(Array.FindElement);
        delegateArray(a,x);
    }
  }
}
```

OUTPUT

```
PS C:\Users\user\Desktop\SEM-3\C#\C-sharp programs\HP1> dotnet run
Enter size of Array:
5
Enter 5 Elements:
2
4
5
6
9
Enter Element to be Searched:
6
Element Found
```