**Bahria University**

**Software Engineering Department**



**Course: CSC-221 DATA STRUCTURES & ALGORITHMS**

**Term: FALL 2019, Class: BSE 3(A)**

**Assignment No:**

|  |  |
| --- | --- |
| **0** | **1** |

**ENROLLMENT #02-131192-082**

**Submitted By:**

**(Name) ADIL WAHEED (Reg. No.) 65190**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Submission Date** | | | | | | | |  |  |  |  |  |
| **0** | **5** | **/** | **0** | **1** | **/** | **2** | **1** |  |  |  |  |

**(Date: DD/MM/YY)**

**Submitted To:**

**Engr. Ramshaa Masood**

**Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Max Marks: \_\_\_\_\_\_\_\_\_\_\_ Marks Obtained: \_\_\_\_\_\_\_\_\_\_\_\_\_**

Bahria University,

Karachi Campus



LAB EXPERIMENT NO.

\_\_\_ASSINGMENT 1\_\_\_\_

LIST OF TASKS

|  |  |
| --- | --- |
| TASK NO | OBJECTIVE |
| 1 | Write an algorithm that finds the smallest and largest number in a list (an array) of n numbers. |
| 2 | Write an algorithm that prints out all the subset of four elements of a set of n elements the elements of this set are sorted in a list that is input to the algorithm. |
|  |  |

**Q 1: - Write an algorithm that finds the smallest and largest number in a list (an array) of n numbers.**

**Solution:**

class Program

{

//Assignment Task 1 completed via QuickSort

public static void Sort(int [] a, int n)

{

Sort(a, 0, n - 1);

}

private static void Sort(int [] a, int low, int up)

{

if (low>=up) // zero or one element in sub list

return;

int p = Partition(a, low, up);

Sort(a, low, p-1); // sort left sublist

Sort(a, p + 1, up); // sort right sublist

}

private static int Partition(int [] a, int low, int up)

{

int temp, i, j, pivot;

pivot = a[low];

i = low + 1; // moves from left to right

j = up; // moves from right to left

while (i <= j)

{

while (a[i] < pivot && i < up)

i++;

while (a[j] > pivot)

j--;

if (i < j) // swap a[i] and a[j]

{

temp = a[i];

a[i] = a[j];

a[j] = temp;

i++;

j--;

}

else // found proper place for pivot

break;

}

// proper place for pivot is j

a[low] = a[j];

a[j] = pivot;

return j;

}

static void Main(string[] args)

{

int i, n;

int[] a = new int[20];

Console.Write("Enter the number of elements in array: ");

n = Convert.ToInt32(Console.ReadLine());

for (i = 0; i < n; i++)

{

Console.Write("Enter Elements " + (i + 1) + ":");

a[i] = Convert.ToInt32(Console.ReadLine());

}

Sort(a, n);

Console.WriteLine("Smallest number is:" + a[0] );

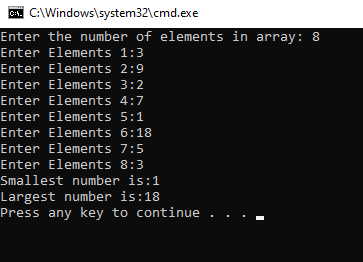
Console.WriteLine("Largest number is:" + a[n-1]);

}

}

}

**Output:**



**Q 2: - Write an algorithm that prints out all the subset of four elements of a set of n elements the elements of this set are sorted in a list that is input to the algorithm.**

**Solution:**

class Program

{

static void InputArray(int[] A)

{

for (int i = 0; i < A.Length; i++)

{

Console.Write("Enter Integer value # {0} : ",i+1);

int.TryParse(Console.ReadLine(), out A[i]);

}

}

static void DisplaySubset(int[] set)

{

int count = 0;

for (int i = 0; i < set.Length; i++)

{

for (int j = i + 1; j < set.Length; j++)

{

for (int k = j + 1; k < set.Length; k++)

{

for (int l = k + 1; l < set.Length; l++)

Console.WriteLine("Subset # {0,-2}: [ {1} {2} {3} {4} ]", ++count, set[i], set[j], set[k], set[l]);

}

}

}

}

static void Main(string[] args)

{

Console.Write("Enter size of array: ");

int x;

int.TryParse(Console.ReadLine(), out x);

int[] data = new int[x];

InputArray(data);

Console.WriteLine("....All subsets of four elemnts of Entered array is:... ");

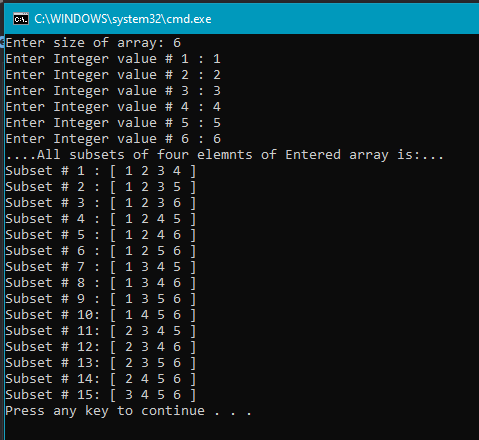
DisplaySubset(data);

}

}

}

**Output:**

****