Bahria University,
Karachi Campus

LAB EXPERIMENT NO.
01

LIST OF TASKS

TASK NO	OBJECTIVE
01	Which type of sorting you want to apply? Create a menu having the following options: i. Bubble Sort Method ii. Selection Sort Method iii. Insertion Sort Method Implement using methods.
02	Implement Selection sort and print string array data in descending order.
03	A Detox chemical Industry has a list of chemicals along with their concentration and Volume. Your task is to list down the name of chemicals in descending order based on their Volume. In order to fulfil the task you have to select any of the sorting method taught in todays lab with proper reasoning of usage of that algorithm.
04	You have to write a program which take input from the user and place the value on correct location in ascending order.
05	Write a program which take N numbers of grocery items from user along with their price. Your main task is to display the items in sorted format. Then allow user to search for any of the item from that list by using name of the item.

Submitted On:
25-09-2018
(Date: DD/MM/YY)

TASK 01

Which type of sorting you want to apply? Create a menu having the following options:

iv. Bubble Sort Method
v. Selection Sort Method
vi. Insertion Sort Method

Implement using methods.

SOLUTION

```
using System;
using System.Collections.Generic;
using System.Linq;
using System.Text;
using System.Threading.Tasks;

namespace Task_1
{
    class Program
    {
        public static void Bubble(int[] arr)
        {
            int n = arr.Length;
            int k;
            for (int m = n; m >= 0; m--)
            {
                for (int i = 0; i < n - 1; i++)
                {
                    k = i + 1;
                    if (arr[i] > arr[k])
                    {
                        int temp;
                        temp = arr[i];
                        arr[i] = arr[k];
                        arr[k] = temp;
                    }
                }
            }
        }
        public static void Selection(int[] arr)
        {
            for (int i = 0; i < arr.Length - 1; i++)
            {
                int index = i;
                for (int j = i; j < arr.Length; j++)
                {
                    if (arr[index] > arr[j])
                    {
                        index = j;
                    }
                }
```

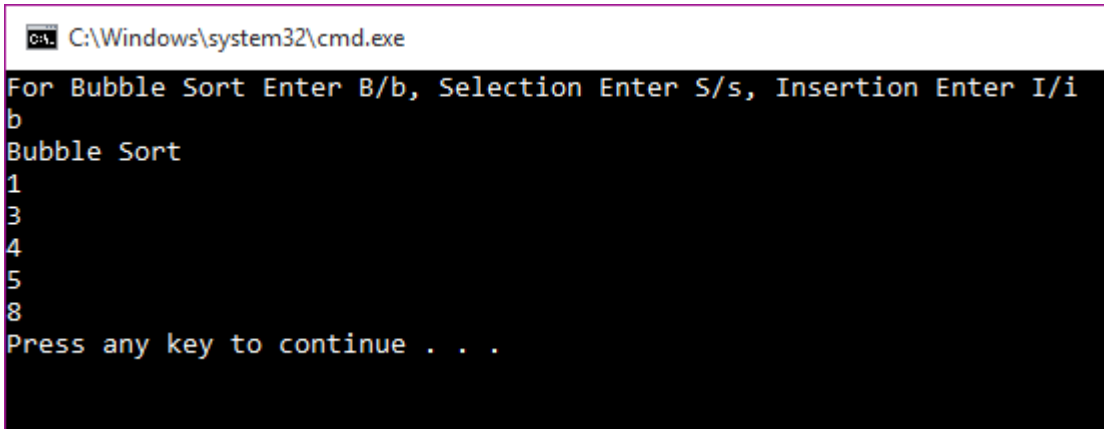
```
                int temp = arr[index];
                arr[index] = arr[i];
                arr[i] = temp;
            }
        }

        public static void Insertion(int[] arr)
        {
            int temp;
            for (int i = 1; i < arr.Length; i++)
            {
                for (int j = i; j > 0; j--)
                {
                    if (arr[j] < arr[j - 1])
                    {
                        temp = arr[j];
                        arr[j] = arr[j - 1];
                        arr[j - 1] = temp;
                    }
                }
            }
        }

        public static void Display(int[] arr)
        {
            for (int i = 0; i < arr.Length; i++)
            {
                Console.WriteLine(arr[i]);
            }
        }

        static void Main(string[] args)
        {
            Console.WriteLine("For Bubble Sort Enter B/b, Selection Enter S/s, Insertion Enter
I/i");
            string select = Console.ReadLine();
            int[] arr = new int[5] { 5, 1, 8, 4, 3 };
            if (select == "b" || select == "B")
            {
                Console.WriteLine("Bubble Sort");
                Bubble(arr);
                Display(arr);
            }
            else if (select == "s" || select == "S")
            {
                Console.WriteLine("Selection Sort");
                Selection(arr);
                Display(arr);
            }
            else if (select == "I" || select == "i")
            {
                Console.WriteLine("Insertion Sort");
                Insertion(arr);
                Display(arr);
            }
        }
    }
}
```

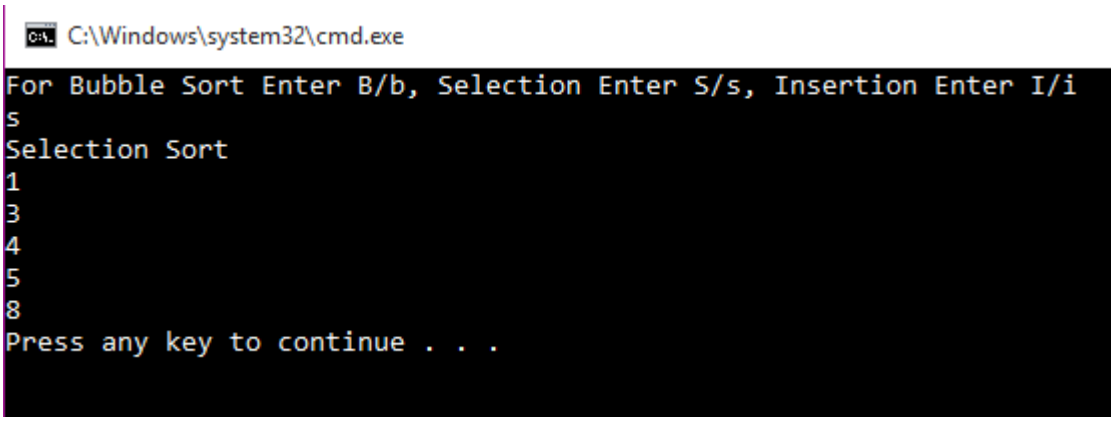
Lab No. 01

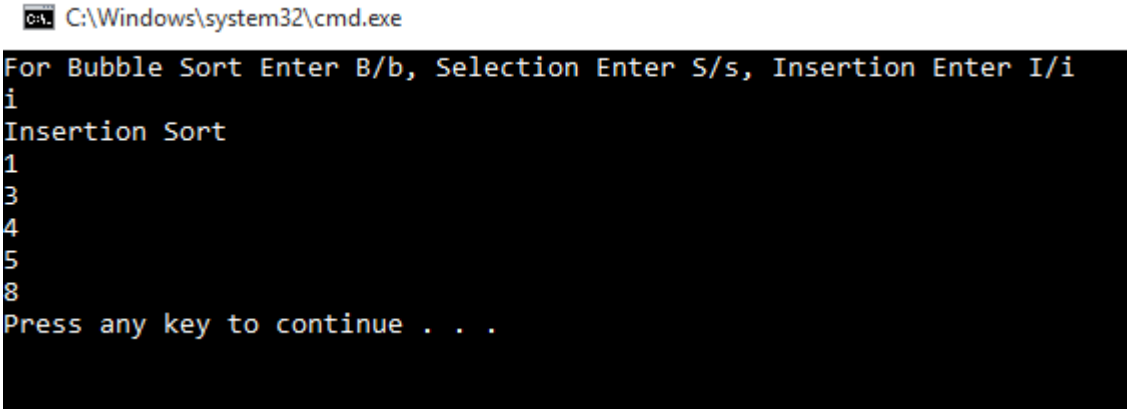
DATA STRUCTURES AND ALGORITHM

Sorting Algorithm (Revision)

OUTPUT


C:\Windows\system32\cmd.exe
For Bubble Sort Enter B/b, Selection Enter S/s, Insertion Enter I/i
b
Bubble Sort
1
3
4
5
8
Press any key to continue . . .


C:\Windows\system32\cmd.exe
For Bubble Sort Enter B/b, Selection Enter S/s, Insertion Enter I/i
s
Selection Sort
1
3
4
5
8
Press any key to continue . . .


C:\Windows\system32\cmd.exe
For Bubble Sort Enter B/b, Selection Enter S/s, Insertion Enter I/i
i
Insertion Sort
1
3
4
5
8
Press any key to continue . . .

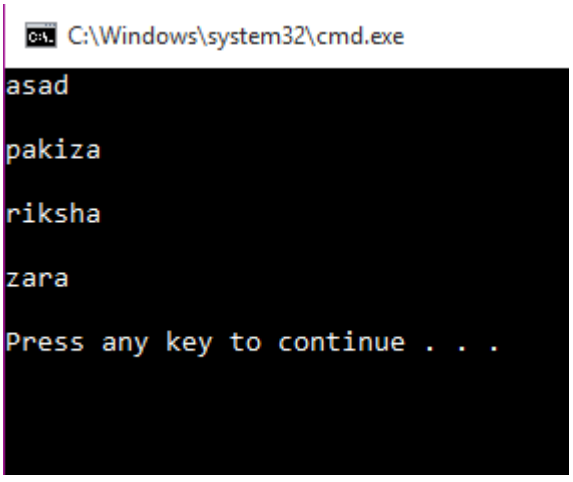
TASK 02

Implement Selection sort and print string array data in descending order.

SOLUTION

```
using System;
using System.Collections.Generic;
using System.Linq;
using System.Text;
using System.Threading.Tasks;

namespace Task_2
{
    class Program
    {
        static void Main(string[] args)
        {
            string[] name = new string[4] { "zara", "pakiza", "riksha", "asad" };
            for (int i = 0; i < name.Length; i++)
            {
                int index = i;
                for (int j = i; j < name.Length; j++)
                {
                    if (name[j].CompareTo(name[index]) == -1)
                    {
                        index = j;
                    }
                }
                string temp = name[index];
                name[index] = name[i];
                name[i] = temp;
                Console.WriteLine(name[i] + "\n");
            }
        }
    }
}
```

OUTPUT



Lab No. 01

DATA STRUCTURES AND ALGORITHM

Sorting Algorithm (Revision)

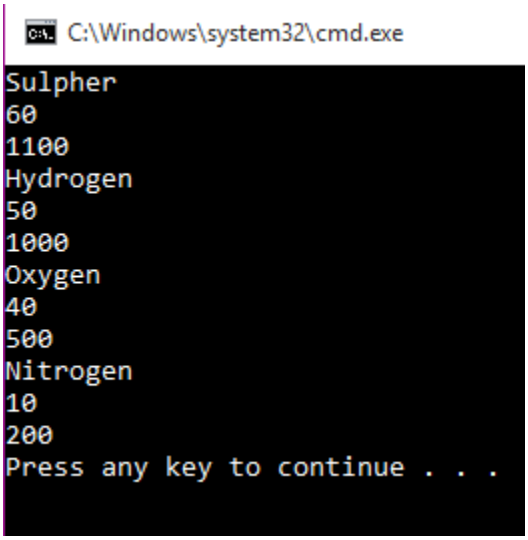
TASK 03

A Detox chemical Industry has a list of chemicals along with their concentration and Volume. Your task is to list down the name of chemicals in descending order based on their Volume. In order to fulfil the task you have to select any of the sorting method taught in todays lab with proper reasoning of usage of that algorithm.

SOLUTION

```
using System;
using System.Collections.Generic;
using System.Linq;
using System.Text;
using System.Threading.Tasks;

namespace Task_3
{
    class Program
    {
        static void Main(string[] args)
        {
            string[,] Chemical = new string[4, 3] { { "Hydrogen", "50", "1000" }, { "Oxygen",
"40", "500" }, { "Nitrogen", "10", "200" }, { "Sulpher", "60", "1100" } };
            for (int j = 0; j <= 3; j++)
            {
                int index = j;
                for (int k = j; k < 4; k++)
                {
                    if (Chemical[k, 2].CompareTo(Chemical[j, 2]) == 1 || Chemical[k,
2].CompareTo(Chemical[j, 2]) == -1)
                    {
                        index = k;
                    }
                }
                string vol = Chemical[index, 2];
                Chemical[index, 2] = Chemical[j, 2];
                Chemical[j, 2] = vol;
                string name = Chemical[index, 0];
                Chemical[index, 0] = Chemical[j, 0];
                Chemical[j, 0] = name;
                string cont = Chemical[index, 1];
                Chemical[index, 1] = Chemical[j, 1];
                Chemical[j, 1] = cont;
                Console.WriteLine(Chemical[j, 0]);
                Console.WriteLine(Chemical[j, 1]);
                Console.WriteLine(Chemical[j, 2]);
            }
        }
    }
}
```

OUTPUT


C:\Windows\system32\cmd.exe
Sulpher
60
1100
Hydrogen
50
1000
Oxygen
40
500
Nitrogen
10
200
Press any key to continue . . .

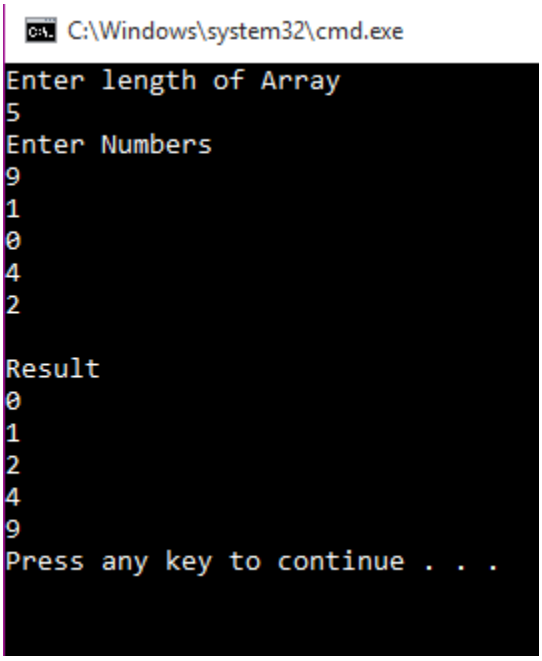
TASK 04

You have to write a program which take input from the user and place the value on correct location in ascending order.

SOLUTION

```
using System;
using System.Collections.Generic;
using System.Linq;
using System.Text;
using System.Threading.Tasks;

namespace Task_4
{
    class Program
    {
        static void Main(string[] args)
        {
            Console.WriteLine("Enter length of Array");
            int n = Convert.ToInt32(Console.ReadLine());
            Console.WriteLine("Enter Numbers");
            int[] arr = new int[n];
            for (int i = 0; i < arr.Length; i++)
            {
                arr [i] = Convert.ToInt32(Console.ReadLine());
            }
            for (int j = 0; j < arr.Length; j++)
            {
                int index = j;
                for (int k = j; k < arr.Length; k++)
                {
                    if (arr[index] > arr[k])
                    {
                        index = k;
                    }
                }
                int temp = arr[index];
                arr[index] = arr[j];
                arr[j] = temp;
            }
            Console.WriteLine("\nResult");
            for (int l = 0; l < arr.Length; l++)
            {
                Console.WriteLine(arr[l]);
            }
        }
    }
}
```

OUTPUT


C:\Windows\system32\cmd.exe
Enter length of Array
5
Enter Numbers
9
1
0
4
2
Result
0
1
2
4
9
Press any key to continue . . .

TASK 05

Write a program which take N numbers of grocery items from user along with their price. Your main task is to display the items in sorted format. Then allow user to search for any of the item from that list by using name of the item.

SOLUTION

```
using System;
using System.Collections.Generic;
using System.Linq;
using System.Text;
using System.Threading.Tasks;

namespace Task_5
{
    class Program
    {
        static void Main(string[] args)
        {
            Console.WriteLine("Enter number of items you want to enter");
            int n = Convert.ToInt32(Console.ReadLine());
            string[,] gross = new string[n, 2];
            for (int i = 0; i < n; i++)
            {
                Console.WriteLine("Enter Grocery Name");
                gross[i, 0] = Console.ReadLine();
                Console.WriteLine("Enter Grocery Price");
                gross[i, 1] = Console.ReadLine();
            }
            for (int j = 0; j < 2; j++)
            {
                int index = j;
                for (int k = j; k < n; k++)
                {
                    if (gross[k, 0].CompareTo(gross[j, 0]) == -1)
                    {
                        index = k;
                    }
                }
                string name = gross[index, 0];
                gross[index, 0] = gross[j, 0];
                gross[j, 0] = name;
                string price = gross[index, 1];
                gross[index, 1] = gross[j, 1];
                gross[j, 1] = price;

            }
            Console.WriteLine("Enter Item Name to Search");
            string search = Console.ReadLine();
            for (int s = 0; s <= n; s++)
            {
                if (search.Equals(gross[s, 0]))
                {
                    Console.WriteLine("Your Searched item is :");
                    Console.WriteLine(gross[s, 0]);
```

```
                    Console.WriteLine(gross[s, 1]);
                    break;
                }
                else if (!search.Equals(gross[s, 0]))
                {
                    Console.WriteLine("No Item Found");
                    break;
                }
            }
        }
    }
}
```

OUTPUT