Bahria University,

Karachi Campus

A picture containing text, room

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LAB EXPERIMENT NO.

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LIST OF TASKS

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| --- | --- |
| TASK NO | OBJECTIVE |
|  | **Linear Search & Sorting Algorithms** |
| 1 | Which type of sorting you want to apply? Create a menu having the following options:   * 1. Bubble Sort Method   2. Selection Sort Method   3. Insertion Sort Method   Implement using methods |
| 2 | Implement Selection sort and print string array data in descending order. |
| 3 | 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 today’s lab with proper reasoning of usage of that algorithm. |
| 4 | You have to write a program which take input from the user and place the value on correct location in ascending order. |
| 5 | 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:

(Date: DD/MM/YY)

**TASK # 1:** Which type of sorting you want to apply? Create a menu having the following options:

1. Bubble Sort Method
2. Selection Sort Method
3. Insertion Sort Method

Implement using methods

**INPUT:**

public void bubble () {

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

Console. WriteLine("BEfore Sorting");

foreach (var item in array)

{

Console.Write(item + " ");

}

int n = array.Length;

int k;

for (int m = n; m >= 0; m--)

{

for (int i = 0; i < n - 1; i++)

{

k = i + 1;

if (array[i] > array[k])

{

int temp;

temp = array[i];

array[i] = array[k];

array[k] = temp;

}

}

}

Console.WriteLine("\n-----------------------------");

Console.WriteLine("After sorting");

foreach (var item in array)

{

Console.Write(item + " ");

}

}

public void selection\_sort() {

int[] arr = { 5,1,12,-5,16,2,12,14};

Console.WriteLine("BEfore Sorting");

foreach (var item in arr)

{

Console.Write(item + " ");

}

int temp, smallest;

int n = 8;

for (int i = 0; i < n - 1; i++)

{

smallest = i;

for (int j = i + 1; j < n; j++)

{

if (arr[j] < arr[smallest])

{

smallest = j;

}

}

temp = arr[smallest];

arr[smallest] = arr[i];

arr[i] = temp;

}

Console.WriteLine("\n-----------------------------");

Console.WriteLine("After sorting");

foreach (var item in arr)

{

Console.Write(item + " ");

}

}

public void insertion\_sort()

{

int[] inputArray = { 5, 2, 4, 6, 1, 3 };

Console.WriteLine("BEfore Sorting");

foreach (var item in inputArray)

{

Console.Write(item + " ");

}

for (int i = 0; i < inputArray.Length - 1; i++)

{

for (int j = i + 1; j > 0; j--)

{

if (inputArray[j - 1] > inputArray[j])

{

int temp = inputArray[j - 1];

inputArray[j - 1] = inputArray[j];

inputArray[j] = temp;

}

}

}

Console.WriteLine("\n-----------------------------");

Console.WriteLine("After sorting");

foreach (var item in inputArray)

{

Console.Write(item + " ");

}

}

static void Main(string[] args)

{

Program p = new Program();

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

int[] arr = { 5, 1, 12, -5, 16, 2, 12, 14 };

int[] inputArray = { 5, 2, 4, 6, 1, 3 };

char ch;

do

{

Console.WriteLine("Enter The Method What You want To Use ");

Console.WriteLine("1 : Bubble Sort Method");

Console.WriteLine("2 : Selection Sort Method");

Console.WriteLine("3 : Insertion Sort Method");

int a = int.Parse(Console.ReadLine());

if (a==1)

{

p.bubble();

}

else if (a==2)

{

p.selection\_sort();

}

else if (a==2)

{

p.insertion\_sort();

}

Console.WriteLine("\nIf You want TO Do Again Press[y/n]");

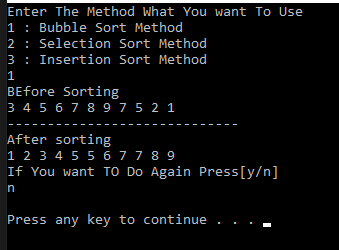
ch = Char.Parse(Console.ReadLine());

} while (ch=='y');

Console.ReadLine();

}

**OUTPUT:**

****

**TASK # 2:**  Implement Selection sort and print string array data in descending order.

**INPUT:**

string[] arr = { "zad","food","apple","volleball","cat"};

foreach (string a1rr in arr)

{

Console.Write(a1rr + "\t");

}

string temp;

int S =0;

for (int i = 0; i < arr.Length-1; i++)

{

S = i;

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

{

if (string.Compare(arr[i] ,arr[j])>0)

{

temp = arr[i];

arr[i] = arr[j];

arr[j] = temp;

}

}

}

Console.WriteLine("\n----------------------------------------------");

Console.WriteLine("Sorted String is :");

foreach (string a1rr in arr)

{

Console.Write(a1rr+"\t");

}

Console.ReadLine();

}

**OUTPUT:**

**Text

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**TASK # 3:**  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.

**INPUT:**

int j; int temp, smallest, n = 3, S1 = 0, S2 = 0;

string T1, T2;

string[,] array1 = { { "iodine", "12", "11" }, { "bromine", "4", "3" }, { "Bronze", "3", "7" } };

Console.WriteLine("chemical \tconcentration\tvolume");

Console.WriteLine("-----------------------------------------------");

for (int i = 0; i < 3; i++)

{

for (j = 0; j < 3; j++)

{

Console.Write(array1[i, j] + "\t\t");

}

Console.WriteLine();

}

Console.WriteLine("------------------------------------------------");

for (int i = 0; i < n - 1; i++)

{

smallest = i;

for (j = i + 1; j < n; j++)

{

if (int.Parse(array1[j, 2]) < int.Parse(array1[smallest, 2]))

{

smallest = j;

S1 = j;

S2 = j;

}

}

temp = int.Parse(array1[smallest, 2]);

array1[smallest, 2] = array1[i, 2];

array1[i, 2] = temp.ToString();

T1 = array1[i, 0];

array1[i, 0] = array1[S1, 0];

array1[S1, 0] = T1;

T2 = array1[i, 1];

array1[i, 1] = array1[S1, 1];

array1[S2, 1] = T2;

}

Console.WriteLine("--------------------------------------------");

for (int i = 0; i < 3; i++)

{

for (j = 0; j < 3; j++)

{

Console.Write(array1[i, j] + "\t\t");

}

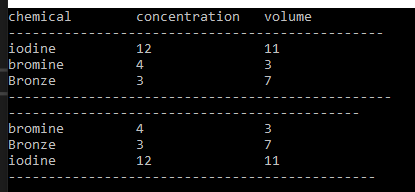
Console.WriteLine();

}

Console.WriteLine("----------------------------------------------");

Console.ReadLine();

**OUTPUT:**

****

**TASK # 4:**  You have to write a program which take input from the user and place the value on correct location in ascending order.

**INPUT:**

int[] arr = new int[6];

int j=0, i=0;

int s = 0, temp;

Console.WriteLine("Enter The Elements of array :");

for (i = 0; i<arr.Length; i++)

{

arr[i] = int.Parse(Console.ReadLine());

}

for ( i = 0; i < arr.Length-1; i++)

{

s = i;

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

{

if (arr[i]>arr[j])

{

temp = arr[i];

arr[i] = arr[j];

arr[j] = temp;

}

}

}

Console.WriteLine("-------------------------------------------");

Console.WriteLine("After sorting .:");

foreach (var item in arr)

{

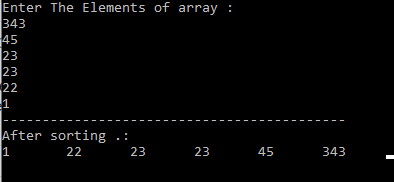
Console.Write(item+"\t");

}

Console.ReadLine();

}

**OUTPUT:**

****

**TASK # 5:**  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

**INPUT:**

public static void Print(string[,] array, int size)

{

Console.WriteLine("------------------------------------------------");

Console.WriteLine("NAME\t\tPRICE\n");

Console.WriteLine("------------------------------------------------");

for (int i = 0; i < size; i++)

{

Console.WriteLine("{0}\t\t{1}",array[i, 0], array[i, 1]);

}

}

public static void bubbleSort(string[,] array, int size)

{

string tempName;

String tempPrice;

for (int i = 0; i < size; i++)

{

for (int j = (i + 1); j < size; j++)

{

if (array[i, 0][0] > array[j, 0][0])

{

tempName = array[i, 0];

tempPrice = array[i, 1];

array[i, 0] = array[j, 0];

array[i, 1] = array[j, 1];

array[j, 0] = tempName;

array[j, 1] = tempPrice;

}

}

}

}

public static string LinearSearch(string[,] array, int size, string searchitem)

{

string index = "-1";

for (int i = 0; i < size; i++)

{

if (searchitem == array[i, 0])

{

index = Convert.ToString(i);

break;

}

}

return index;

}

static void Main(string[] args)

{

Console.Write("Enter total Item : ");

int size = int.Parse(Console.ReadLine());

string[,] array = new string[size, 2];

for (int i = 0; i < size; i++)

{

Console.Write("Enter Name Of Item At [{0},{1}] Index : ", i, 0);

array[i, 0] = Console.ReadLine().ToLower();

Console.Write("Enter Price Of Item At [{0},{1}] Index : ", i, 1);

array[i, 1] = Console.ReadLine();

}

Console.Clear();

Print(array, size);

Console.WriteLine("\n After Sorting Alphabatically \n");

bubbleSort(array, size);

Print(array, size);

Console.Write("\nEnter Item Name You Want To Search : ");

string searchitem = Console.ReadLine();

string found = LinearSearch(array, size, searchitem);

if (found != "-1")

{

Console.WriteLine("Element Is Fount AT Index [{0},{1}]", LinearSearch(array, size, searchitem), 0);

}

int size1 = Convert.ToInt32(LinearSearch(array, size, searchitem));

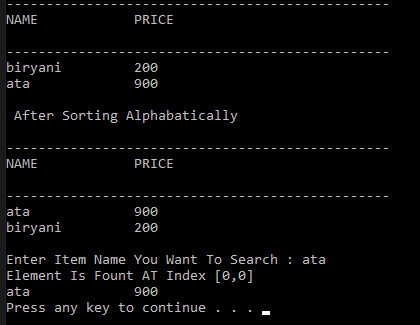
for (int i = size1; i <= size1; i++)

{

Console.WriteLine("{0}\t\t{1}",array[i, 0], array[i, 1]);

}}}

**OUTPUT:**

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