Experiment No. 10

* Aim:- Implementation of selection sorting Technique considering real world application.

* Objective:- To impart knowledge of sorting and searching algorithm.

* Theory:-

1) Introduction to sorting:
Sorting is the process of arranging the elements of an array so that they can be placed either in ascending or descending order. eg: consider any array $A = \{A_1, A_2, A_3, A_4 \ldots A_n\}$, the array is called to be in ascending order if element of A are array like $A1 > A2 > A3 > A4 > \ldots > An$

2) Types of sorting:
i) Bubble sort
It is the simplest sort method which performs sorting by repeatedly moving the largest element to the highest index of array. It comprises of comparing each element to its adjacent item and replace them accordingly.

ii) Insertion sort:
The insertion sort inserts each element of the array to its proper place. It is very simple sort method which is used to arrange the deck of cards while playing bridge.

iii) Selection sort
Selection Sort finds the smallest element in the array and places it on first place of the list, then it finds the second smallest element in the array and place it on second place. This process continues until all elements are moved to their correct order.

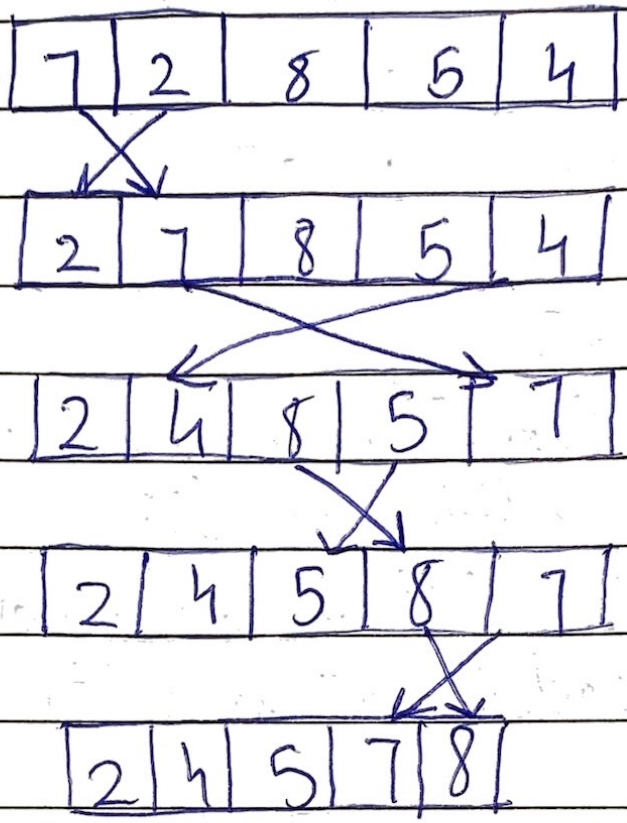
iv) Merge sort:
Merge sort follows divide and conquer approach in which the list is first divided into the sets of equal elements and then each half of the list is sorted by using merge sort.

3) Introduction to selection sort:
It is a simple sorting algorithm. This sorting algorithm is an inplace comparison based algorithm in which the list is divided into two parts, the sorted part at the left end and unsorted part at the right end. Initially the sorted part is empty and the unsorted part is the entire list.

4) Algorithm
Selection sort (A[0...n-1])
// sorts a given array by selection sort.
// input: An array A[0...n-1] of orderable elements.
// output: Array A[0...n-1] sorted in ascending order.

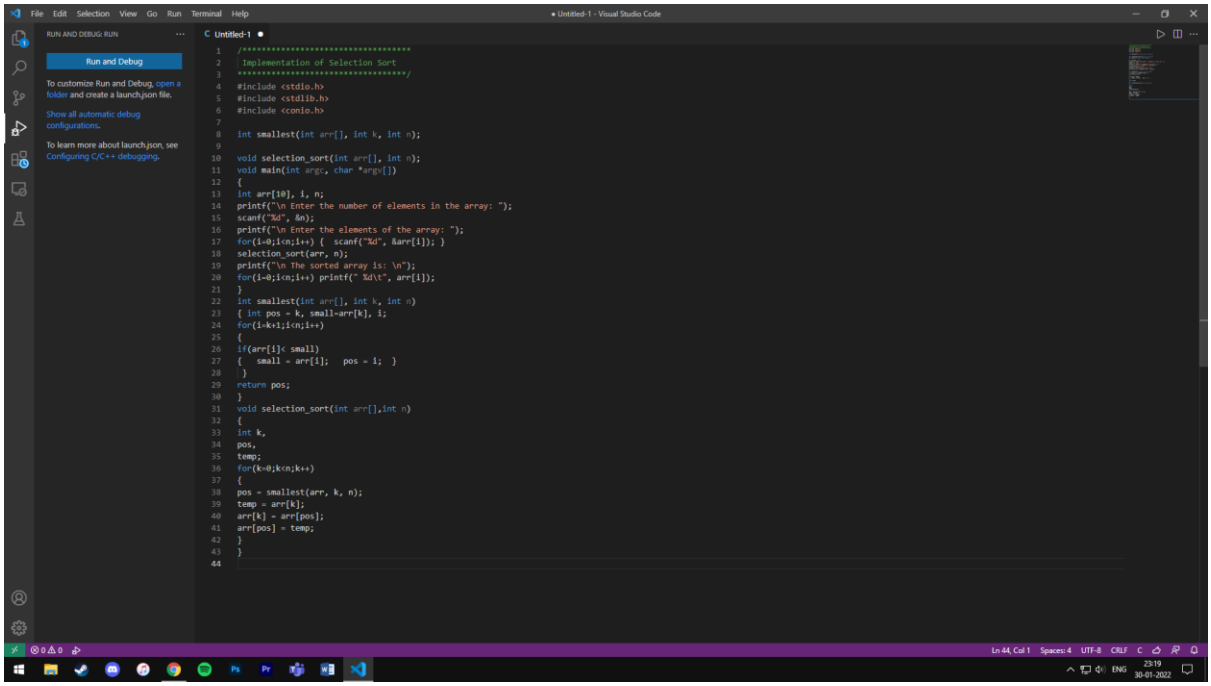
```
For i ← 0 to n-2 do
    min ← i
    for j ← i + 1 to n - 1 do
    IF A[j] < A[min]  min ← j
    swap A[i] and A[min]
```

5] Example:-



* Conclusion :-
Selection sort is sorting algorithm known by its simplicity. Unfortunately it lacks efficiency on huge list of items and also it does not stop unless the number of iterations has been achieved even though the list is already sorted.

* Outcome :
Implement sorting and searching techniques for real world applications.


File Edit Selection View Go Run Terminal Help
• Untitled-1 - Visual Studio Code
RUN AND DEBUG: RUN
Run and Debug
To customize Run and Debug, open a folder and create a launch.json file.
Show all automatic debug configurations.
To learn more about launch.json, see Configuring C/C++ debugging.
Untitled-1
/*************************************
Implementation of Selection Sort
*************************************/
#include <stdio.h>
#include <stdlib.h>
#include <conio.h>
int smallest(int arr[], int k, int n);
void selection_sort(int arr[], int n);
void main(int argc, char *argv[])
{
int arr[10], i, n;
printf("\n Enter the number of elements in the array: ");
scanf("%d", &n);
printf("\n Enter the elements of the array: ");
for(i=0;i<n;i++) { scanf("%d", &arr[i]); }
selection_sort(arr, n);
printf("\n The sorted array is: \n");
for(i=0;i<n;i++) printf(" %d\t", arr[i]);
}
int smallest(int arr[], int k, int n)
{ int pos = k, small=arr[k], i;
for(i=k+1;i<n;i++)
{
if(arr[i]< small)
{ small = arr[i]; pos = i; }
}
return pos;
}
void selection_sort(int arr[],int n)
{
int k,
pos,
temp;
for(k=0;k<n;k++)
{
pos = smallest(arr, k, n);
temp = arr[k];
arr[k] = arr[pos];
arr[pos] = temp;
}
}
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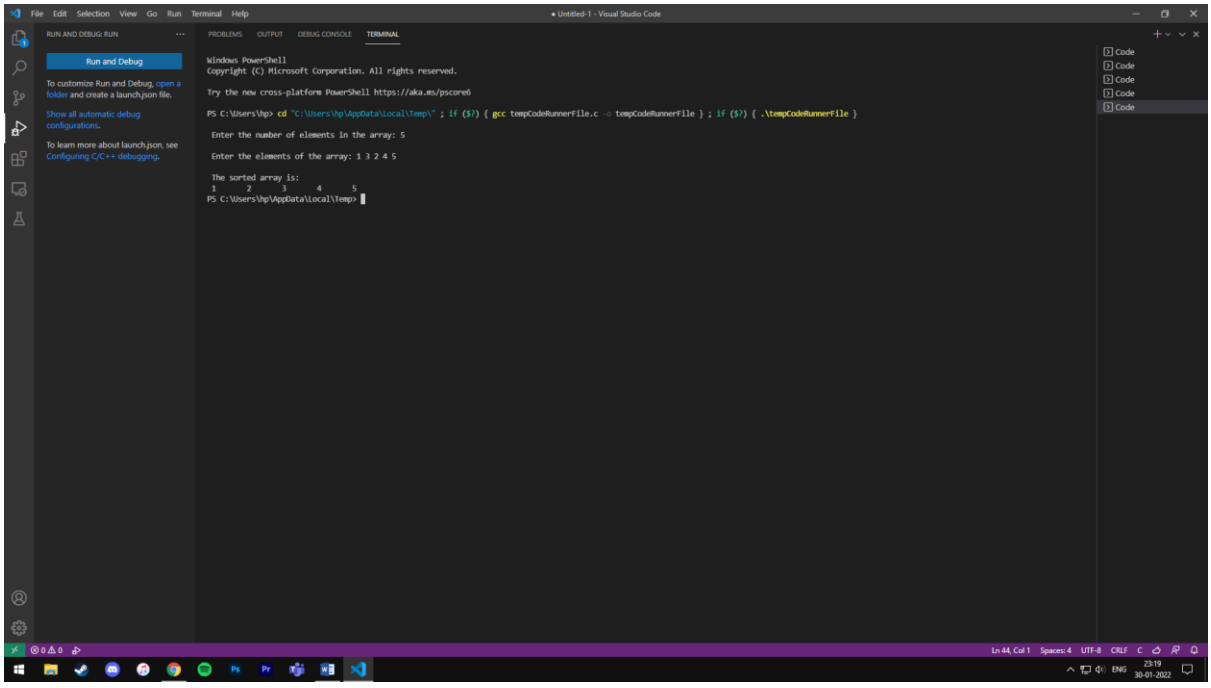
ENG 23:19 30-01-2022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PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.
Try the new cross-platform PowerShell https://aka.ms/pscore6
PS C:\Users\hp> cd "C:\Users\hp\AppData\Local\Temp\" ; if ($?) { gcc tempCodeRunnerFile.c -o tempCodeRunnerFile } ; if ($?) { .\tempCodeRunnerFile }
Enter the number of elements in the array: 5
Enter the elements of the array: 1 3 2 4 5
The sorted array is:
1 2 3 4 5
PS C:\Users\hp\AppData\Local\Temp>
Code
Code
Code
Code
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