Lab Program

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CSE-H

1) Write a program for insert sort algorithm

Ans)
```
# include <stdio.h>
Void main()
{
  int n, array[1000], c, d, t;
  Printf("Enter number of elements \n");
  Scanf("%d", &n);
  Printf("Enter %d integers\n", n);
  for (c=0; c<n; c++) {
        Scanf("%od", &array[c]);
  }
  for (c=1; c<=n-1; c++){
  d=c;
  while (d>0 && array[d-1] > array[d]){
        t= array[d];
        array[d] = array[d-1];
        array[d-1] = t;
        d--;
    }
}
Printf("Sorted array in ascending order : \n");
for (c=0; c<=n-1; c++){
     Printf("%d\n", array[c]);
}
```

Output:

```
Enter number of elements
7
Enter 7 integers
9
7
5
3
8
4
6
Sorted array in ascending order
3
4
5
6
7
8
9
```

2) Write a program for the selection sort

Ans)

```
#include<stdio.h>
Void main()
{
int array[100],n, c,d , position , temp;
Printf( "Enter number of elements\n");
Scanf ("%d", &n);
Printf( "Enter %d integers\n" , n );
for (c=0; c<n; c++) {
        Scanf ("%d", &array[c]);

}
```

```
for(c=0; c<(n-1); c++) {
    position=c;
    for(d=c+1; d<n; d++){
    if (array[position] > array[d])
        position=d;
    }
    if(position!=c) {
        temp=array[c];
        array[c] = array[position];
        array[position] = temp;
    }
}
printf("Sorted array in ascending order:\n");
for(c=0; c<n; c++){
        printf("%d\n", array[c]);
    }
}
```

Output:

```
Enter number of elements
8
Enter 8 integers
9
2
4
1
6
8
7
5
```

Sorted array in ascending orders:

1
2
4
5
6
7
8
9

3) Write a program for Bubble sort algorithm

Ans)
```
#include<stdio.h>
Void main()
{
int array[1000],n,c,d, position, temp;
Printf("Enter number of elements \n");
Scanf("%d", &n);
Printf("Enter %d integers\n", n);
for(c=0; c<n; c++){
    Scanf("%d", &array[c]);
}
for (c=0; c<(n-1); c++){
    for (d=0; d<n-c-1; d++){
        if (array[d]> array[d+1]){
            temp=array[d];
            array[d] = array[d+1]
            array[d+1] = temp;
        }
```

```
    }
  }
  Printf("Sorted list in Ascending order:\n");
  for(i=0;i<n;i++){
        Printf("%d\n",array[i]);
  }
}
```

Output:-

```
Enter number of elements
5
Enter 5 integers:
9
5
8
3
4
Sorted list in ascending order
3
4
5
8
9
```

4) Write a program for the merge sort algorithm

Ans)
```
#include <stdlib.h>
#include <stdio.h>
Void merge (int arr[] int l, int m, int r)
{
    int i, j, k;
    int n1 = m - l + 1;
    int n2 = r - m;
    int L[n1], R[n2];
    for (i=0; i<n1; i++)
    L[i] = arr[l+i];
    for (j=0; j<n2; j++)
    R[j] = arr[m+1+j];

    i=0;
    j=0;
    k=l;
    while (i<n1 && j<n2)
    {
        if (L[i] <= R[j])
        {
            arr[k] = L[i];
            i++;
        }
```

```
else
{
arr[k] = R[j];
j++;
}
k++;
}
while (i < n1)
{
arr[k] = L[i];
i++;
k++;
}
while (j < n2)
{
arr[k] = R[j];
j++;
k++;
}
}
void mergesort(int arr[], int l, int r)
{
    if(l<r)
    {
        int m = l + (r-l)/2;
```

```
        mergeSort (arr, l, m);
        mergeSort (arr, m+1, r);
        merge (arr, l, m, r);
    }
}

Void printArray (int A[], int size)
{
    int i;
    for (i=0; i< size; i++)
    Printf("%d", A[i]);
    Printf("\n");
}
int main()
{
  int arr[] = {9, 10, 15, 8, 4};
  int arr_size = sizeof (arr / sizeof (arr[0]);
  Printf ("Given array is \n");
  Print Array (arr, arr_size);
  mergeSort (arr, 0, arr_size -1);
  Printf ("\n Sorted array is \n");
  Print Array (arr, arr_size);
  return 0;
}
```

Output :-

Given array is

1 9 4 10 8

Sorted array is

1 4 8 9 10