Lab Programs

B. Vardhan Kumar Reddy
AP19110010493
CSE-H

1) Write a Program for insert Sort algorithm.

Ans)
```
#include<stdio.h>
Void main ()
{
  int n, array[100], 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 ("%d", &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[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++){
        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 order:
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 (c=0; c<n; c++){
    Printf("%d\n", array[c]);
}
}
```

output:-

```
Enter number of elements
5
Enter 5 integers
9
5
8
6
1
```

Sorted list in ascending order:

1
5
6
8
9

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+l+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");
  PrintArray(arr, arr_size);

  mergeSort(arr, 0, arr_size-1);

  Printf("\n Sorted array is \n");
  PrintArray(arr, arr_size);
  return 0;
}
```

Output

Given array is

9 10 15 8 4

Sorted array is

4 8 9 10 15