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LAB PROGRAMS

1)Write a program for the Insertion sort algorithm.

Code:

```
#include<stdio.h>
void InsertionSort(int a[], int n)
{
    int j, p;
    int tmp;
    for(p = 1; p < n; p++)
    {
        tmp = a[p];
        for(j = p; j > 0 && a[j-1] > tmp; j--)
            a[j] = a[j-1];
        a[j] = tmp;
    }
}

int main()
{
    int i, n, a[10];
    printf("Enter the number of elements :: ");
    scanf("%d",&n);
    printf("Enter the elements :: ");
    for(i = 0; i < n; i++)
```

```
    {
        scanf("%d",&a[i]);
    }
    InsertionSort(a,n);
    printf("The sorted elements are ::  ");
    for(i = 0; i < n; i++)
        printf("%d  ",a[i]);
    printf("\n");
    return 0;
}
```

2) Write a program for the Selection sort algorithm.

Code:

```
#include <stdio.h>
int main()
{
  int array[100], n, c, d, position, 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 = 0; c < (n - 1); c++)
  {
    position = c;
    for (d = c + 1; d < n; d++)
    {
      if (array[position] > array[d])
        position = d;
    }
    if (position != c)
    {
```

```
      t = array[c];
      array[c] = array[position];
      array[position] = t;
    }
  }
  printf("Sorted list in ascending order:\n");
  for (c = 0; c < n; c++)
    printf("%d\n", array[c]);
  return 0;
}
```

3)Write a program for Bubble sort algorithm

Code:

```
#include<stdio.h>
main()
{
    int a[10],i,j,temp,n;
    printf("\n Enter the max no.of Elements to Sort: \n");
    scanf("%d",&n);
    printf("\n Enter the Elements : \n");
    for(i=0; i<n; i++)
    {
        scanf("%d",&a[i]);
    }
    for(i=0; i<n; i++)
        for(j=i+1; j<n; j++)
        {
            if(a[i]>a[j])
            {
                temp=a[i];
                a[i]=a[j];
                a[j]=temp;
```

```
            }
        }
    for(i=0; i<n; i++)
    {
        printf("%d\t",a[i]);
    }
    return 0;
}
```

4)Write a program for the Merge sort algorithm.

Code:

```
#include<stdio.h>
void mergesort(int a[],int i,int j);
void merge(int a[],int i1,int j1,int i2,int j2);
 int main()
{
        int a[30],n,i;
        printf("Enter no of elements:");
        scanf("%d",&n);
        printf("Enter array elements:");

        for(i=0;i<n;i++)
                scanf("%d",&a[i]);
        mergesort(a,0,n-1);
        printf("\nSorted array is :");
        for(i=0;i<n;i++)
                printf("%d ",a[i]);

        return 0;
}
void mergesort(int a[],int i,int j)
{
```

```
	int mid;
	if(i<j)
	{
		mid=(i+j)/2;
		mergesort(a,i,mid);
		mergesort(a,mid+1,j);
		merge(a,i,mid,mid+1,j);
	}
}
void merge(int a[],int i1,int j1,int i2,int j2)
{
	int temp[50];
	int i,j,k;
	i=i1;
	j=i2;
	k=0;
	while(i<=j1 && j<=j2)
	{
		if(a[i]<a[j])
			temp[k++]=a[i++];
		else
			temp[k++]=a[j++];
	}
	while(i<=j1)
		temp[k++]=a[i++];

	while(j<=j2)
		temp[k++]=a[j++];
	for(i=i1,j=0;i<=j2;i++,j++)
		a[i]=temp[j];
}
```