Lab Programs

1. Write a program for the Insertion sort algorithm.

```
 #include <stdio.h>
void main() {
   int n, array[100], i, j, Temp;
   printf("Enter number of elements\n");
   scanf("%d", &n);
   printf("Enter %d integers\n", n);
   for (i = 0; i < n; i++)
           scanf("%d", &array[i]);
   for (i = 1 ; i <= n - 1; i++) {
       j = i;
        while (j > 0 && array[j-1] > array[j]) {
           Temp = array[j];
           array[j] = array[j-1];
           array[j-1] = Temp;
           j--;
        }
}
printf("Sorted array in ascending order:\n");
for (i = 0; i <= n - 1; i++) {
      printf("%d\n", array[i]);
```

```
    }
}
```

2. Write a program for the Selection sort algorithm.

```
 #include <stdio.h>
void main()
{
   int array[100], n, a, b, pos, temp;
   printf("Enter number of elements\n");
   scanf("%d", &n);
   printf("Enter %d integers\n", n);
   for (a = 0; a < n; a++)
       scanf("%d", &array[a]);
   for (a = 0; a < (n - 1); a++)
  {
      pos = a;
      for (b = a + 1; b < n; a++)
      {
         if (array[pos] > array[b])
            pos = b;
        }
      if (pos != a)
            {
```

```
      temp = array[a];
      array[a] = array[pos];
      array[pos] = temp;
      }
          }
          printf("Sorted array in ascending order:\n");
     for (a = 0; a < n; a++)
        printf("%d\n", array[a]);
     }
```

3. Write a program for the Bubble sort algorithm.

```
 #include <stdio.h>
void main()
{
   int array[100], n, i, j, Temp;
   printf("Enter number of elements\n");
      scanf("%d", &n);
    printf("Enter %d integers\n", n);
    for (i = 0; i < n; i++)
         scanf("%d", &array[i]);
    for (i = 0 ; i < n - 1; i++)
          {
       for (j = 0 ; j < n - a - 1; j++)
```

```
      {
        if (array[j] > array[j+1])
        {
           Temp = array[j];
          array[j] = array[j+1];
          array[j+1] = Temp;
        }
      }
    }
     printf("Sorted list in ascending order:\n");
     for (i = 0; i < n; i++)
          printf("%d\n", array[i]);
     }
```

4. Write a program for the Merge sort algorithm.

```
 void mergesort(int a[],int i , int j);
void merge(int a[], int i1, int j1, int i2, int j2);
int main()
{
        int a[100],n,i;
        printf(“Enter number 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("\n Sorted 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+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];
}
```