# LAB PROGRAMS

## 1. Write a program for the Insertion sort algorithm.

```c
#include <stdio.h>

void main()

{

  int n, array[1000], a, b, p;

  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 = 1 ; a <= n - 1; a++) {

      b = a;

      while (b > 0 && array[b-1] > array[b]) {

      p = array[b];

      array[b] = array[b-1];

      array[b-1] = p;

      b--;

      }

}

printf("Sorted array in ascending order:\n");
```

```c
for (a = 0; a <= n - 1; a++) {

    printf("%d\n", array[a]);

    }

}
```

## 2. Write a program for the Selection sort algorithm.

```c
#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;
```

```c
        }

        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 Bubble sort algorithm.

```c
#include <stdio.h>
void main()
{
  int array[100], n, a, b, 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]);
```

```c
for (a = 0 ; a < n - 1; a++)

{

for (b = 0 ; b < n - a - 1; b++)

{

if (array[b] > array[b+1])

{

    temp = array[b];

    array[b] = array[b+1];

    array[b+1] = temp;

}

}

}
printf("Sorted list in ascending order:\n");
for (a = 0; a < n; a++)

    printf("%d\n", array[a]);

}
```

## 4. Write a program for the Merge sort algorithm.

```c
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;
```

```c
        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("\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];

}
```