Lab Record

Question 1: Write a program for the Insertion sort algorithm.

Answer:

Code:

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

```
}
}
printf("Sorted the array in ascending order:\n");
for (i=0; i<=n-1; i++)
{
printf("%d\n", a[i]);
}
}
```

Output:

```
Enter the number of elements in the array:
4
Enter 4 integer elements in the array:
43
21
98
72
Sorted the array in ascending order:
21
43
72
98
```

Question 2: Write a program for the Selection sort algorithm.

Answer:

Code:

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

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

Output:

```
Enter the number of elements in the array:
4
Enter 4 integer elements in the array
52
11
6
51
Sorted the array in ascending order:
6
11
51
52
```

Question 3: Write a program for Bubble sort algorithm.

Answer:

Code:

```
#include <stdio.h>
void main()
{
```

```
int a[100],n,i,j,temp;
printf("Enter the number of elements in the array:\n");
scanf("%d", &n);
printf("Enter %d integer elements in the array:\n", n);
for (i=0;i<n;i++)
scanf("%d",&a[i]);
for (i=0;i<n-1;i++)
{
for (j=0;j<n-i-1;j++)
{
if (a[j]>a[j+1])
{
temp=a[j];
a[j]=a[j+1];
a[j+1]=temp;
}
}
}
printf("Sorted the array in ascending order:\n");
for (i=0;i<n;i++)
{
printf("%d\n",a[i]);
}
}
```

Output:

```
Enter the number of elements in the array:
6
Enter 6 integer elements in the array:
42
23
2
65
86
22
Sorted the array in ascending order:
2
22
23
42
65
86
```

Question 4: Write a program for the Merge sort algorithm.

Answer:

Code:

```
#include<stdio.h>
void merge(int a[],int i1, int j1, int i2, int j2)
{
int t[100];
int i,j,k;
k=0;
```

```
i=i1;
j=i2;
while(i<=j1 && j<=j2)
{
if(a[i]<a[j])
t[k++]=a[i++];
else
t[k++]=a[j++];
}
while(i<=j1)
{
t[k++]=a[i++];
}
while(j<=j2)
{
t[k++]=a[j++];
}
for(i=i1,j=0;i<=j2;i++,j++)
{
a[i]=t[j];
}
}

void mergesort(int a[],int i,int j)
{
int middle;
if(i<j)
```

```
{
middle=(i+j)/2;
mergesort(a,i,middle);
mergesort(a,middle+1,j);
merge(a,i,middle,middle+1,j);
}
}

void main()
{
int a[100],n,i;
printf("Enter the number of elements in the array: \n ");
scanf("%d",&n);
printf("Enter %d integer elements in the array: \n ",n);
for(i=0;i<n;i++)
{
scanf("%d",&a[i]);
}
mergesort(a,0,n-1);
printf("\n Sorted the array in ascending order :\n");
for(i=0;i<n;i++)
{
printf("%d \n", a[i]);
}
}
```

Output:

```
Enter the number of elements in the array:
 5
Enter 5 integer elements in the array:
 40
50
20
100
10

 Sorted the array in ascending order :
10
20
40
50
100
```