

Insertion Sort, Bubble Sort and Selection Sort

Selection Sort Algorithm:

The algorithm divides the input list into two parts: the sublist of items already sorted, which is built up from left to right and is found at the end, and the sublist of items remaining to be sorted, occupying the rest of the list. Initially, the sorted sublist is empty and the unsorted sublist is the entire input list. The algorithm proceeds by always finding the next largest (or smallest, depending on sorting order) element and exchanges it with the final element of the array.

Here is an example of this sort algorithm sorting five elements:

```
64 25 12 22 11
11 25 12 22 64
11 12 25 22 64
11 12 22 25 64
11 12 22 25 64
11 12 22 25 64
```

Selection sort program

```
#include<stdio.h>

void main()
{
int array[100], n, c, d, position, swap;

printf("Enter number of elements\n");
scanf("%d", &n);

printf("Enter %d integers\n", n);

for(c = 0 ; c < n ; c++)
scan("%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 )
{
swap = array[c];
array[c] = array[position];
array[position] = swap;
}
}

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

for(c = 0 ; c < n ; c++ )
printf("%d\n", array[c]);

}
```

Bubble sort code

//Bubble sort Implementation in C language:

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

    printf("\n Enter number of elements:");
    scanf("%d", &n);
    printf("\n Enter %d integers in the Array\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])
            {
                swap    = array[d];
                array[d] = array[d+1];
                array[d+1] = swap;
            }
        }
    }
    printf("\n Sorted list in ascending order:");
    for ( c = 0 ; c < n ; c++ )
        printf("%d\n", array[c]);
}
```

Insertion sort (Ascending order)

```
#include <stdio.h>

void main()
{
    int n, array[1000], 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] < array[d-1])
        {
            t = array[d];
            array[d] = array[d-1];
            array[d-1] = t;
            d--;
        }
    }

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

    for(c = 0; c <= n - 1; c++)
    {
        printf("%d\n", array[c]);
    }
}
```