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➢ Laboratory *Assignment #8*

A. Write a program to sort a list of elements using bubble sort algorithm .

Ans:

```
#include <stdio.h>
void swap(int *xp, int *yp)
{
    int temp = *xp;
    *xp = *yp;
    *yp = temp;
}

void printArray(int arr[], int size)
{
    int i;
    for (i = 0; i < size; i++)
        printf("%d ", arr[i]);
    printf("\n");
}

void bubbleSort(int arr[], int n)
{
    int i, j;
    for (i = 0; i < n - 1; i++){

        for (j = 0; j < n - i - 1; j++)
        {
            if (arr[j] > arr[j + 1])
```

```
            {
                swap(&arr[j], &arr[j + 1]);
            }
        }
    printf("\n after Pass %d:", i + 1);
    printArray(arr, n);
    }
}

int main()
{
    int a[10], n, i;
    printf("\n Enter how many numbers <= 10: ");
    scanf("%d", &n);
    printf("\n Enter numbers one by one:");
    for (i = 0; i < n; i++)
        scanf("%d", &a[i]);
    bubbleSort(a, n);
    printf("Sorted array: \n");
    printArray(a, n);
}
```

OUTPUT =>

```
 Enter how many numbers <= 50:
10

 Enter numbers one by one:
```

4

8

9

2

1

5

7

6

3

0

after Pass 1:4 8 2 1 5 7 6 3 0 9

after Pass 2:4 2 1 5 7 6 3 0 8 9

after Pass 3:2 1 4 5 6 3 0 7 8 9

after Pass 4:1 2 4 5 3 0 6 7 8 9

after Pass 5:1 2 4 3 0 5 6 7 8 9

after Pass 6:1 2 3 0 4 5 6 7 8 9

after Pass 7:1 2 0 3 4 5 6 7 8 9

after Pass 8:1 0 2 3 4 5 6 7 8 9

```
 after Pass 9:0 1 2 3 4 5 6 7 8 9
Sorted array:
0 1 2 3 4 5 6 7 8 9


--------------------------------
Process exited after 86.42 seconds with return value 0
Press any key to continue . . .
```

B. WRITE A PROGRAM TO SORT A LIST OF ELEMENTS USING MODIFIED BUBBLE SORT ALGORITHM.

Ans:

```
#include <stdio.h>
void swap(int *xp, int *yp)
{
    int temp = *xp;
    *xp = *yp;
    *yp = temp;
}

void printArray(int arr[], int size)
{
    int i;
    for (i = 0; i < size; i++)
        printf("%d ", arr[i]);
    printf("\n");
}
```

```
void bubbleSort(int arr[], int n)
{
    int i, j;
    for (i = 0; i < n - 1; i++){

        for (j = 0; j < n - i - 1; j++)
        {
            if (arr[j] > arr[j + 1])
            {
                swap(&arr[j], &arr[j + 1]);
            }
        }
    printf("\n after Pass %d:", i + 1);
    printArray(arr, n);
    }
}

void modifiedBubbleSort(int arr[], int n)
{
    int i, j,sw;
    for (i = 0; i < n - 1; i++){
        sw=0;
        for (j = 0; j < n - i - 1; j++)
        {
            if (arr[j] > arr[j + 1])
            {
```

```
            swap(&arr[j], &arr[j + 1]);
            sw =1;
        }
    }
    if (sw == 0){
        break;
    }
    printf("\n after Pass %d:", i + 1);
    printArray(arr, n);
    }
}

int main()
{
    int a[50], n, i;
    printf("\n Enter how many numbers <= 50: ");
    scanf("%d", &n);
    printf("\n Enter numbers one by one:");
    for (i = 0; i < n; i++)
        scanf("%d", &a[i]);
    modifiedBubbleSort(a, n);
    printf("Sorted array: \n");
    printArray(a, n);
}
```

OUTPUT =>

```
Enter numbers one by one:
```

3

5

6

7

8

1

9

4

2

0

after Pass 1:3 5 6 7 1 8 4 2 0 9

after Pass 2:3 5 6 1 7 4 2 0 8 9

after Pass 3:3 5 1 6 4 2 0 7 8 9

after Pass 4:3 1 5 4 2 0 6 7 8 9

after Pass 5:1 3 4 2 0 5 6 7 8 9

after Pass 6:1 3 2 0 4 5 6 7 8 9

after Pass 7:1 2 0 3 4 5 6 7 8 9

after Pass 8:1 0 2 3 4 5 6 7 8 9

```
 after Pass 9:0 1 2 3 4 5 6 7 8 9
Sorted array:
0 1 2 3 4 5 6 7 8 9


--------------------------------
Process exited after 35.38 seconds with return value 0
Press any key to continue . . .
```

C. WRITE A PROGRAM TO SORT A LIST OF ELEMENTS USING SELECTION SORT ALGORITHM.

Ans:

```
#include <stdio.h>
void inputArray(int a[], int n){
int i;
printf("\n Enter numbers one by one:");
for(i=0;i<n;i++)
scanf("%d",&a[i]);
}
void selectionSort(int a[], int n)
{
int i, j, min, l, t;
for (i = 0; i < n-1; i++)
{ min = a[i];
l=i;
for (j = i+1; j < n; j++) {
if (a[j] < min) {
```

```
min = a[j];
l=j;
}
}
if(i!=l){
t = a[i];
a[i]=a[l];
a[l]=t;

}
}
printf("\n after pass %d :", i + 1);
printArray(a, n);
}
void printArray(int a[], int n)
{ int i;
for (i=0; i < n; i++)
printf("%d ", a[i]);
printf("\n");
}
int main()
{
int a[50],n;
printf("\n Enter how many numbers<=50");
scanf("%d",&n);
inputArray(a,n);
selectionSort(a, n);
```

```
printf("Sorted array: \n");
printArray(a, n);
return 0;
}
```

OUTPUT =>

```
 Enter how many numbers<=50
10

 Enter numbers one by one:
3
4
9
2
1
0
7
8
6
5

 after pass 10 :0 1 2 3 4 5 6 7 8 9
Sorted array:
0 1 2 3 4 5 6 7 8 9

--------------------------------
Process exited after 25.38 seconds with return value 0
Press any key to continue . . .
```