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**I.T. – III**

**QUICK SORT**

#include<stdio.h>

#define MAX 30

enum bool {

FALSE, TRUE

};

//Function display the array

void display(int arr[], int low, int up);

//This function will sort the array using Quick sort algorithm

void quick(int arr[], int low, int up);

int main() {

int array[MAX], n, i;

printf("\nEnter the number of elements : ");

scanf("%d", &n);

for (i = 0; i < n; i++) {

printf("\nEnter element %d : ", i + 1);

scanf("%d", &array[i]);

}

printf("\nUnsorted list is :\n");

display(array, 0, n - 1);

printf("\n");

quick(array, 0, n - 1);

printf("\nSorted list is :\n");

display(array, 0, n - 1);

return (0);

}

void display(int arr[], int low, int up) {

int i;

for (i = low; i <= up; i++)

printf("%d ", arr[i]);

}

void quick(int arr[], int low, int up) {

int piv, temp, left, right;

enum bool pivot\_placed = FALSE; //setting the pointers

left = low;

right = up;

piv = low; //Take the first element of sublist as piv

if (low >= up)

return;

printf("\nSublist : ");

display(arr, low, up);

/\*Loop till pivot is placed at proper place in the sublist\*/

while (pivot\_placed == FALSE) {

/\*Compare from right to left \*/

while (arr[piv] <= arr[right] && piv != right)

right = right - 1;

if (piv == right)

pivot\_placed = TRUE;

if (arr[piv] > arr[right]) {

temp = arr[piv];

arr[piv] = arr[right];

arr[right] = temp;

piv = right;

}

/\*Compare from left to right \*/

while (arr[piv] >= arr[left] && left != piv)

left = left + 1;

if (piv == left)

pivot\_placed = TRUE;

if (arr[piv] < arr[left]) {

temp = arr[piv];

arr[piv] = arr[left];

arr[left] = temp;

piv = left;

}

}

printf("-> Pivot Placed is %d -> ", arr[piv]);

display(arr, low, up);

printf("\n");

quick(arr, low, piv - 1);

quick(arr, piv + 1, up);

}

**OUTPUT**

Enter the number of elements : 5

Enter element 1 : 45

Enter element 2 : 42

Enter element 3 : 432

Enter element 4 : 12

Enter element 5 : -343

Unsorted list is :

45 42 432 12 -343

Sublist : 45 42 432 12 -343 -> Pivot Placed is 45 -> -343 42 12 45 432

Sublist : -343 42 12 -> Pivot Placed is -343 -> -343 42 12

Sublist : 42 12 -> Pivot Placed is 42 -> 12 42

Sorted list is :

-343 12 42 45 432