**Write a C program to take n numbers and sort the numbers in ascending order. Try to implement the same using following sorting techniques.**

1. **Quick Sort**
2. **Merge Sort**

**Algorithm:**

**CODE:**

**1. QUICK SORT:**

**#include <stdio.h>**

**void swap(int\* a, int\* b) {**

**int t = \*a;**

**\*a = \*b;**

**\*b = t;**

**}**

**int partition(int arr[], int low, int high) {**

**int pivot = arr[high];**

**int i = (low - 1);**

**for (int j = low; j <= high - 1; j++) {**

**if (arr[j] < pivot) {**

**i++;**

**swap(&arr[i], &arr[j]);**

**}**

**}**

**swap(&arr[i + 1], &arr[high]);**

**return (i + 1);**

**}**

**void quickSort(int arr[], int low, int high) {**

**if (low < high) {**

**int pi = partition(arr, low, high);**

**quickSort(arr, low, pi - 1);**

**quickSort(arr, pi + 1, high);**

**}**

**}**

**void printArray(int arr[], int size) {**

**for (int i = 0; i < size; i++)**

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

**printf("\n");**

**}**

**int main() {**

**int n;**

**printf("Enter the number of elements: ");**

**scanf("%d", &n);**

**int arr[n];**

**printf("Enter %d numbers:\n", n);**

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

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

**}**

**quickSort(arr, 0, n - 1);**

**printf("Sorted array: \n");**

**printArray(arr, n);**

**return 0;**

**}**

**2. MERGE SORT**

#include <stdio.h>

void merge(int arr[], int l, int m, int r) {

int i, j, k;

int n1 = m - l + 1;

int n2 = r - m;

int L[n1], R[n2];

for (i = 0; i < n1; i++)

L[i] = arr[l + i];

for (j = 0; j < n2; j++)

R[j] = arr[m + 1 + j];

i = 0;

j = 0;

k = l;

while (i < n1 && j < n2) {

if (L[i] <= R[j]) {

arr[k] = L[i];

i++;

} else {

arr[k] = R[j];

j++;

}

k++;

}

while (i < n1) {

arr[k] = L[i];

i++;

k++;

}

while (j < n2) {

arr[k] = R[j];

j++;

k++;

}

}

void mergeSort(int arr[], int l, int r) {

if (l < r) {

int m = l + (r - l) / 2;

mergeSort(arr, l, m);

mergeSort(arr, m + 1, r);

merge(arr, l, m, r);

}

}

void printArray(int A[], int size) {

int i;

for (i = 0; i < size; i++)

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

printf("\n");

}

int main() {

int n;

printf("Enter the number of elements: ");

scanf("%d", &n);

int arr[n];

printf("Enter %d numbers:\n", n);

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

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

}

mergeSort(arr, 0, n - 1);

printf("Sorted array: \n");

printArray(arr, n);

return 0;

}

OUTPUT:

QUICK SORT

Elements to sort:7

Enter the elements:5

9

23

11

27

6

16

Sorted elements:

5 6 9 11 16 23 27

OUTPUT:

MERGE SORT:

Elements to sort: 8

Enter the elements:

10

3

7

1

15

14

9

22

Sorted elements:

1. 3 7 9 10 14 15 22