**ASHESH KUMAR**

**501254**

**I.T. – III**

**MERGE SORT**

#include<stdio.h>

#define MAX 20

int array[MAX];

//Function to merge the arrays

void merge(int low, int mid, int high);

//Function which call itself to sort an array

void merge\_sort(int low, int high);

int main() {

int i, n;

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");

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

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

merge\_sort(0, n - 1);

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

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

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

return (0);

}

void merge(int low, int mid, int high) {

int temp[MAX];

int i = low;

int j = mid + 1;

int k = low;

while ((i <= mid) && (j <= high)) {

if (array[i] <= array[ j])

temp[k++] = array[i++];

else

temp[k++] = array[ j++];

}

while (i <= mid)

temp[k++] = array[i++];

while (j <= high)

temp[k++] = array[j++];

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

array[i] = temp[i];

}

void merge\_sort(int low, int high) {

int mid;

if (low != high) {

mid = (low + high) / 2;

merge\_sort(low, mid);

merge\_sort(mid + 1, high);

merge(low, mid, high);

}

}

**OUTPUT**

Enter the number of elements : 5

Enter element 1 : 12

Enter element 2 : 0

Enter element 3 : -43

Enter element 4 : 32

Enter element 5 : 12

Unsorted list is :

12 0 -43 32 12

Sorted list is :

-43 0 12 12 32