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//CSE 11911058

//MERGE SORT OF STRING CHARACTERS

#include <stdio.h>

#include<string.h>

//Function to Merge two sub arrays L and M into array

void merge(int arr[], int p, int q, int r) {

// Create L ← A[p..q] and M ← A[q+1..r]

int n1 = q - p + 1;

int n2 = r - q;

int L[n1], M[n2];

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

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

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

M[j] = arr[q + 1 + j];

// Maintain index of sub-arrays and main array

int i, j, k;

i = 0;

j = 0;

k = p;

// Until we reach either end of either L or M, pick larger among

// elements L and M and place them in the correct position at A[p..r]

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

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

arr[k] = L[i];

i++;

} else {

arr[k] = M[j];

j++;

}

k++;

}

// When we run out of elements in either L or M,

// pick up the remaining elements and put in A[p..r]

while (i < n1) {

arr[k] = L[i];

i++;

k++;

}

while (j < n2) {

arr[k] = M[j];

j++;

k++;

}

}

// Divide the array into two subarrays, sort them and merge them

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

if (l < r) {

// m is the point where the array is divided into two subarrays

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

mergeSort(arr, l, m);

mergeSort(arr, m + 1, r);

// Merge the sorted subarrays

merge(arr, l, m, r);

}

}

// Print the array

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

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

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

printf("\n");

}

// Driver program

int main()

{

int arr[] = {6, 5, 12, 10, 9, 1};

int size = sizeof(arr) / sizeof(arr[0]);

mergeSort(arr, 0, size - 1);

printf("Sorted array: \n");

printArray(arr, size);

}