**WRITE A PROGRAM IN JAVA IMPLEMENTING THE MERGE SORT ALGORITHM**

package sorting;

import java.util.InputMismatchException;

import java.util.Scanner;

public class MergeSort {

public void merge(int arr[], int low, int mid, int high) {

int res[] = new int[high+1];

int i = low;

int j = mid+1;

int k = low;

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

if(arr[i] < arr[j]) {

res[k] = arr[i];

i++;

k++;

}

else {

res[k] = arr[j];

j++;

k++;

}

}

while(i<=mid) {

res[k] = arr[i];

i++;

k++;

}

while(j<=high) {

res[k] = arr[j];

j++;

k++;

}

for(int a=low; a<=high; a++) {

arr[a] = res[a];

}

}

public void mergeSort(int arr[], int low, int high) {

int mid;

if(low<high) {

mid = low+(high-low)/2;

mergeSort(arr, low, mid);

mergeSort(arr, mid+1, high);

merge(arr, low, mid, high);

}

}

public void printArray(int arr[]) {

System.out.print("[");

for(int i=0; i<arr.length; i++) {

System.out.print(arr[i]);

if(i != arr.length-1) {

System.out.print(",");

}

}

System.out.print("]");

System.out.println();

}

public static void main(String[] args) {

Scanner sc = new Scanner(System.in);

MergeSort obj = new MergeSort();

try {

System.out.println("Enter the size of array: ");

int size = sc.nextInt();

if(size <= 0) {

System.out.println("Invalid input");

sc.close();

return;

}

int arr[] = new int[size];

System.out.println("Enter the array elements: ");

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

arr[i] = sc.nextInt();

}

System.out.println("Original array: ");

obj.printArray(arr);

obj.mergeSort(arr, 0, size-1);

System.out.println("\nAfter sorting: ");

obj.printArray(arr);

} catch (InputMismatchException e) {

System.out.println("Invalid input");

}

catch(Exception e) {

System.out.println(e.getMessage());

}

sc.close();

}

}