Merge Sort:

Approach:

Step 1:Divide

In this sorting technique define the starting index and ending index using this find the mid.

Starting index is 0 and ending index is length.arr-1.

Si=(starting index), Ei=(ending index)

Mid=si+(ei-si)/2

We get left part and right part we have to divide the array till we have to find the smallest array in the given array.

Step 2: Using this we find the mid are parts are driven left side right side in this sort the left side and then right side

Step 3: Merge

Make one temporary array in this merge both side left side and right side

Then difine two itrators for left side and right side compare the first index of both left side and right side then select minimum one and put into the array then do the increment by one to right itarotor and if left is small than right then put into array else put the right one

Base case =si>ei

Si=ei(single)

Code:

public class DivideAndConquer{

    public static void printArr(int arr[]) {

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

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

        }

        System.out.println();

    }

    public static void mergesort(int arr[], int si, int ei) {

        if(si>=ei){

            return;

        }

        int mid=si+(ei-si)/2;

        mergesort(arr, si, mid);

        mergesort(arr, mid+1, ei);

        merge(arr,si,mid,ei);

    }

    public static void merge(int arr[], int si, int mid, int ei) {

        int temp[]=new int[ei-si+1];

        int i=si;

        int j=mid+1;

        int k=0;

        while(i <= mid && j<= ei){

            if(arr[i]<arr[j]){

                temp[k]=arr[i];

                i++;

            }

            else{

                temp[k]=arr[j];

                j++;

            }

            k++;

        }

        while(i<=mid){

            temp[k++]=arr[i++];

        }

        while(j<=ei){

            temp[k++]=arr[j++];

        }

        for(k=0,i=si; k<temp.length; k++,i++){

            arr[i]=temp[k];

        }

    }

    public static void main(String[] args) {

        int arr[]={5,3,7,2,6,8};

        mergesort(arr,0,arr.length-1);

        printArr(arr);

    }

}