**ADS MODULE END EXAM**

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**Q2.**

**Java Code:**

class MergeSort{

void mergesort(int arr[], int start, int end){

if(start < end){

int mid = start + (end - start)/2;

mergesort(arr, start, mid);

mergesort(arr, mid+1, end);

merge(arr, start, mid, end);

}

}

void merge(int arr[], int start, int mid, int end){

int n1 = mid - start + 1;

int n2 = end - mid;

int Start[] = new int[n1];

int End[] = new int[n2];

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

Start[i] = arr[start + i];

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

End[j] = arr[mid + 1 + j];

int i=0,j=0;

int k = start;

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

if(Start[i] < End[j]){

arr[k] = Start[i];

i++;

}else{

arr[k] = End[j];

j++;

}

k++;

}

while (i < n1){

arr[k] = Start[i];

i++;

k++;

}

while (j < n2){

arr[k] = Start[j];

j++;

k++;

}

}

int display(int arr[]){

int x = arr.length;

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

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

}

return x;

}

public static void main(String args[]){

MergeSort m1 = new MergeSort();

int arr[] = {12,23,98,65,45,11};

int x = arr.length;

System.out.print("Unsorted Array: ");

m1.display(arr);

System.out.println();

System.out.print("Sorted Array with Merge Sort : ");

m1.mergesort(arr, 0, x-1);

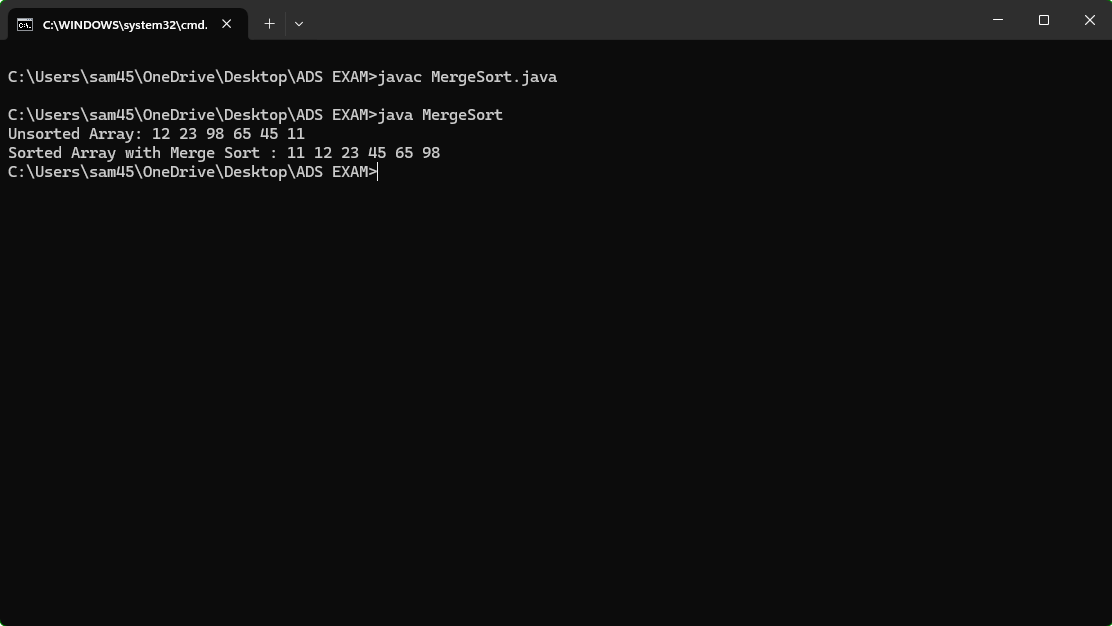
m1.display(arr);

System.out.println();

}

}

**Output Screenshot:**

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