

## 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++;
}

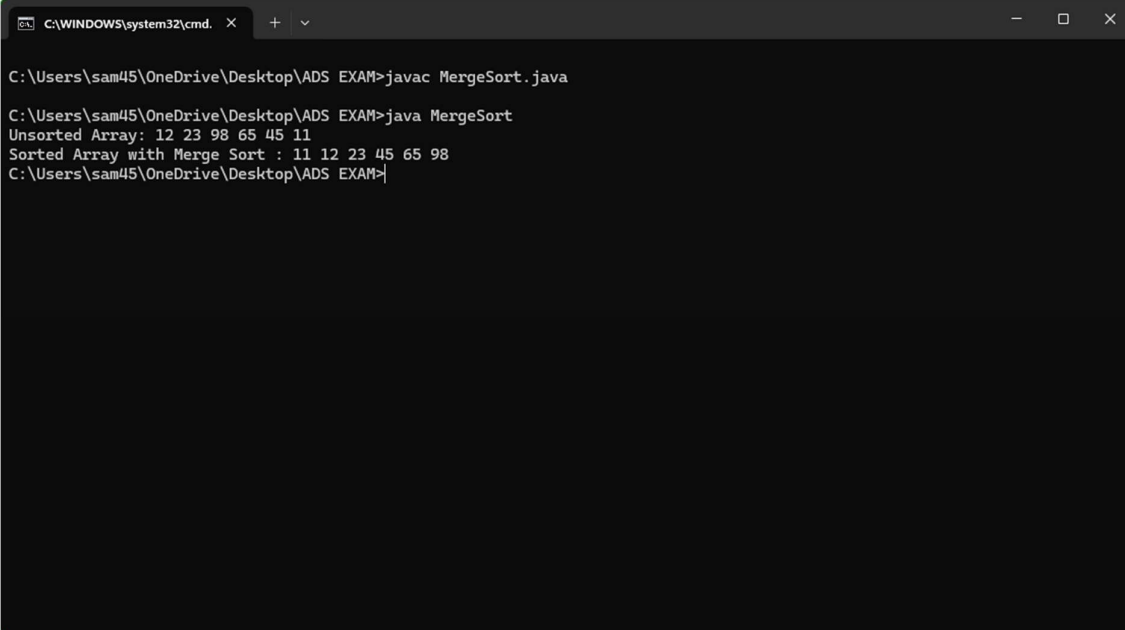
}

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:



```
C:\WINDOWS\system32\cmd. X + v
C:\Users\sam45\OneDrive\Desktop\ADS EXAM>javac MergeSort.java
C:\Users\sam45\OneDrive\Desktop\ADS EXAM>java MergeSort
Unsorted Array: 12 23 98 65 45 11
Sorted Array with Merge Sort : 11 12 23 45 65 98
C:\Users\sam45\OneDrive\Desktop\ADS EXAM>
```

The screenshot shows a Windows command prompt window with a dark background. The title bar at the top indicates the current directory is C:\WINDOWS\system32\cmd. The command prompt shows the user has navigated to C:\Users\sam45\OneDrive\Desktop\ADS EXAM and executed the following commands: `javac MergeSort.java` and `java MergeSort`. The output of the program is displayed as two lines: "Unsorted Array: 12 23 98 65 45 11" and "Sorted Array with Merge Sort : 11 12 23 45 65 98". The prompt is currently waiting for the next command.