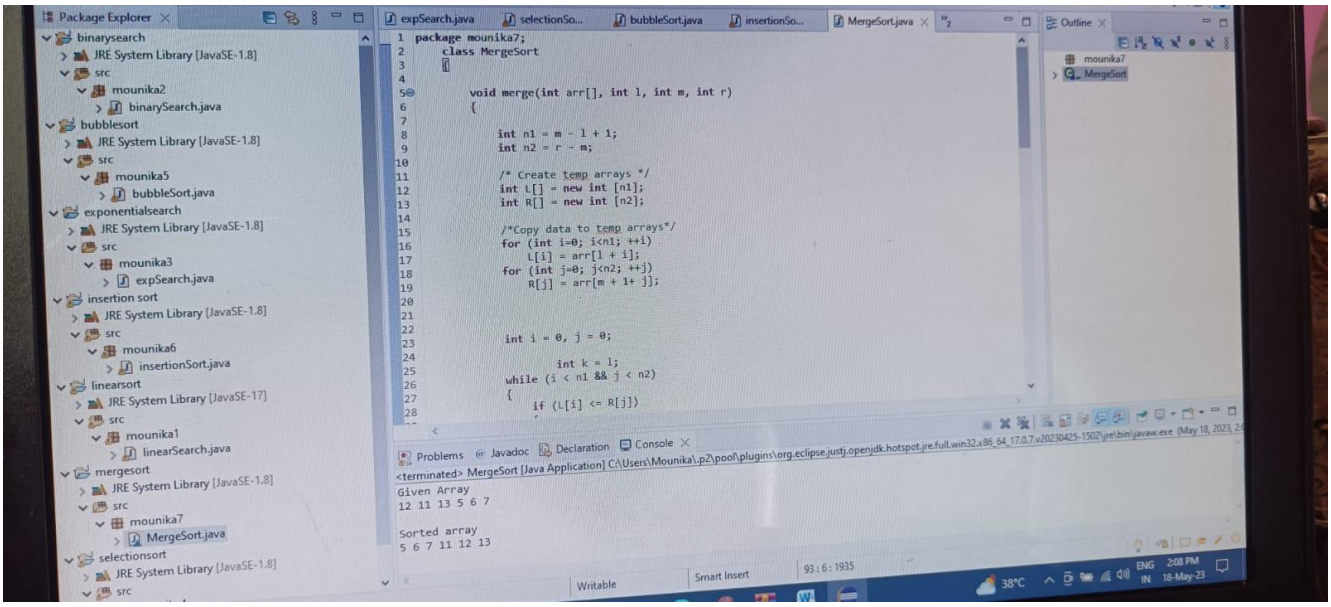
Program 7: Merge Sort

```
package mounika7;
class MergeSort
{

    void merge(int arr[], int l, int m, int r)
    {

        int n1 = m - l + 1;
        int n2 = r - m;

        /* Create temp arrays */
        int L[] = new int [n1];
        int R[] = new int [n2];

        /*Copy data to temp arrays*/
        for (int i=0; i<n1; ++i)
            L[i] = arr[l + i];
        for (int j=0; j<n2; ++j)
            R[j] = arr[m + 1+ j];



        int i = 0, j = 0;

                int k = l;
        while (i < n1 && j < n2)
        {
            if (L[i] <= R[j])
            {
                arr[k] = L[i];
                i++;
            }
            else
            {
                arr[k] = R[j];
                j++;
            }
            k++;
        }
        while (i < n1)
        {
            arr[k] = L[i];
            i++;
            k++;
        }


        while (j < n2)
        {
            arr[k] = R[j];
            j++;
            k++;
```

```
        }
    }
    void sort(int arr[], int l, int r)
    {
        if (l < r)
        {

            int m = (l+r)/2;


            sort(arr, l, m);
            sort(arr , m+1, r);


            merge(arr, l, m, r);
        }
    }

        static void printArray(int arr[])
    {
        int n = arr.length;
        for (int i=0; i<n; ++i)
            System.out.print(arr[i] + " ");
        System.out.println();
    }

    // Driver method
    public static void main(String args[])
    {
        int arr[] = {12, 11, 13, 5, 6, 7};

        System.out.println("Given Array");
        printArray(arr);

        MergeSort ob = new MergeSort();
        ob.sort(arr, 0, arr.length-1);

        System.out.println("\nSorted array");
        printArray(arr);
    }
}
```


Package Explorer
binarysearch
JRE System Library [JavaSE-1.8]
src
mounika2
binarySearch.java
bubblesort
JRE System Library [JavaSE-1.8]
src
mounika5
bubbleSort.java
exponentialsearch
JRE System Library [JavaSE-1.8]
src
mounika3
expSearch.java
insertion sort
JRE System Library [JavaSE-1.8]
src
mounika6
insertionSort.java
linearsort
JRE System Library [JavaSE-17]
src
mounika1
linearSearch.java
mergesort
JRE System Library [JavaSE-1.8]
src
mounika7
MergeSort.java
selectionsort
JRE System Library [JavaSE-1.8]
src
expSearch.java
selectionSo...
bubbleSort.java
insertionSo...
MergeSort.java
1 package mounika7;
2 class MergeSort
3 {
4
5 void merge(int arr[], int l, int m, int r)
6 {
7
8 int n1 = m - l + 1;
9 int n2 = r - m;
10
11 /* Create temp arrays */
12 int L[] = new int [n1];
13 int R[] = new int [n2];
14
15 /*Copy data to temp arrays*/
16 for (int i=0; i<n1; ++i)
17 L[i] = arr[l + i];
18 for (int j=0; j<n2; ++j)
19 R[j] = arr[m + 1+ j];
20
21
22
23 int i = 0, j = 0;
24
25 int k = l;
26 while (i < n1 && j < n2)
27 {
28 if (L[i] <= R[j])
Outline
mounika7
MergeSort
Problems
Javadoc
Declaration
Console
<terminated> MergeSort [Java Application] C:\Users\Mounika\.p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win32.x86_64_17.0.7.v20230425-1502\jre\bin\javaw.exe (May 18, 2023, 2:
Given Array
12 11 13 5 6 7
Sorted array
5 6 7 11 12 13
Writable
Smart Insert
93 : 6 : 1935
38°C
ENG
IN
2:08 PM
18-May-23