

Data Structures and Algorithms

CSE2001

Lab - 4 - Assignment - 2

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Problem : Merge Sort Algorithm

```
import java.util.*;

public class MSort
{

    public static void merge(int a[],int l,int m,int h)
    {
        int i,j,c=l;
        int b[]=new int[h+1];

        for(i = l,j = m+1; i<=m && j<=h; c++)
        {

            if(a[i] <= a[j])
                b[c] = a[i++];
            else
                b[c] = a[j++];
        }
    }
}
```

```
while(i <= m )  
    b[c++] = a[i++];
```

```
while(j<=h)  
    b[c++] = a[j++];
```

```
for(i = l ; i <= h; i++)  
    a[i] = b[i];
```

```
}
```

```
public static void Sort(int a[],int l,int h)
```

```
{
```

```
    if(l<h)
```

```
    {
```

```
        int m=(l+h)/2;
```

```
        Sort(a,l,m);
```

```
        Sort(a,m+1,h);
```

```
        merge(a,l,m,h);
```

```
    }
```

```
}
```

```
public static void printarray(int a[])
```

```
{
```

```
    for(int i=0; i < a.length; i++)
```

```
    {
```

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

```
    }
```

```

}

public static void main(String[] args)
{
    int n, res,i;
    Scanner s = new Scanner(System.in);
    System.out.print("Enter number of elements in the array:");
    n = s.nextInt();
    int a[] = new int[n];
    System.out.println("Enter "+n+" elements ");
    for( i=0; i < n; i++)
    {
        a[i] = s.nextInt();
    }

    System.out.println( "elements in array ");
    printarray(a);
    Sort(a,0,n-1);
    System.out.println( "elements after sorting");
    printarray(a);
}
}

```

Output

```

PS C:\Users\yashw> & 'C:\Users\yashw\.vscode\extensions\vscjava.vscode-java-debug-0.34.0\scripts\launcher.bat' 'C:\Program Files\Java\jdk-15.0.2\bin\java.exe' '-XX:+ShowCodeDetailsInExceptionMessages' '-Dfile.encoding=UTF-8' '-cp' 'C:\Users\yashw\AppData\Local\Temp\vscodesws_a5ee6\jdt_ws\jdt.ls-java-project\bin' 'MSort'
Enter number of elements in the array:6
Enter 6 elements
22 36 2 6 3 72
elements in array
22 36 2 6 3 72
elements after sorting
2 3 6 22 36 72
PS C:\Users\yashw>

```