

## **BUBBLE SORT CODE:-**

```
package BubbleSort;

import java.util.Arrays;

public class MainBubble
{
    int temp;
    public int[] program(int[] a)
    {
        for(int i=0;i<a.length;i++)
        {
            int flag=0;
            for(int j=0;j<a.length-1-i;j++)
            {
                if(a[j]>a[j+1])
                {
                    temp=a[j];
                    a[j]=a[j+1];
                    a[j+1]=temp;
                    flag=1;
                }
            }
            if(flag==0)
            {
                break;
            }
        }
        return a;
    }

    public static void main(String[] args)
    {
        int a[]={36,19,29,12,5};
        System.out.println("Unsorted: -"+ Arrays.toString(a));
        MainBubble obj=new MainBubble();
        obj.program(a);
        System.out.println(Arrays.toString(a));
    }
}
```

**INPUTS:-** {36,19,29,12,5}

Output:-Sorted:[13, 19, 21, 36, 48, 52, 94]

```
1 package BubbleSort;
2
3 import java.util.Arrays;
4
5 public class MainBubble
6 {
7     int temp;
8     public int[] program(int[] a)
9     {
10         for(int i=0; i<a.length; i++)
11         {
12             int flag=0;
13             for(int j=0; j<a.length-1-i; j++)
14             {
15                 if(a[j]>a[j+1])
16                 {
17                     temp=a[j];
18                     a[j]=a[j+1];
19                     a[j+1]=temp;
20                     flag=1;
21                 }
22             }
23         }
24     }
25 }
```

Run: mainMerge

"C:\Program Files\JetBrains\IntelliJ IDEA 2019.2.2\jbr\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA 2019.2.2\lib\idea\_rt.jar=52333:C:\Program Files\JetBrains\IntelliJ IDEA 2019.2.2\bin" -Didea.config.path=C:\Program Files\JetBrains\IntelliJ IDEA 2019.2.2\conf -Didea.home.path=C:\Program Files\JetBrains\IntelliJ IDEA 2019.2.2\bin -Didea.platform.prefix=JDK -Didea.vendor.id=jetbrains -Didea.version=2019.2.2 -Didea.config.path=C:\Program Files\JetBrains\IntelliJ IDEA 2019.2.2\conf -Didea.home.path=C:\Program Files\JetBrains\IntelliJ IDEA 2019.2.2\bin -Didea.platform.prefix=JDK -Didea.vendor.id=jetbrains -Didea.version=2019.2.2 -Didea.config.path=C:\Program Files\JetBrains\IntelliJ IDEA 2019.2.2\conf -Didea.home.path=C:\Program Files\JetBrains\IntelliJ IDEA 2019.2.2\bin -Didea.platform.prefix=JDK -Didea.vendor.id=jetbrains -Didea.version=2019.2.2

Unsorted: [48, 36, 13, 52, 19, 94, 21]  
Sorted: [13, 19, 21, 36, 48, 52, 94]

Process finished with exit code 0

Build completed successfully in 11 s 47 ms (moments ago)

## COMPLEXITY:-

Worst and Average Case Time Complexity :  $O(n*n)$ . Worst case occurs when array is reverse sorted.

Best Case Time Complexity:  $O(n)$ . Best case occurs when array is already sorted.

## ALGORITHM:

Given a list L of n elements with values or records  $L_0, L_1, \dots, L_{n-1}$ , bubble sort is applied to sort the list L.

1. Compare first two elements  $L_0, L_1$  in the list.
2. if  $L_1 < L_0$ , swap those elements and continue with next 2 elements.

3. Repeat the same step until whole the list is sorted, so no more swaps are possible.

4. Return the final sorted list.