Experimet – 1

```
import java.util.*;
public class Main {
  public static void printArray(int arr[]){
    System.out.println();
    for(int i=0;i<arr.length;i++){
      System.out.print(arr[i]+"  ");
    }
    System.out.println();
  }
  public static void quickSort(int arr[],int si,int ei){
    if(si>=ei){
      return;
    }
    int mid=pivotIndex(arr,si,ei);
    quickSort(arr,si,mid-1);
    quickSort(arr,mid+1,ei);
  }
  public static int pivotIndex(int arr[],int si,int ei){
    int pi=ei;
    int j=si-1;
    int i=si;
    for( i=si;i<=ei;i++){
      if(arr[i]<=arr[pi]){
        j++;
```

```
        int temp=arr[j];
        arr[j]=arr[i];
        arr[i]=temp;
      }
    }
    return j;
  }
    public static void main(String[] args) {
      System.out.println("enter size:");
      // int n = sc.nextInt();
      int arr[]={30,10,32,80,15,50,40};
      printArray(arr);
      quickSort(arr,0,arr.length-1);
      printArray(arr);
  }
}
```

OUTPUT:

```
enter size:
30  10  32  80  15  50  40
10  15  30  32  40  50  80
```

Experiment -2

```
import java.util.*;

public class Main {
  public static void printArray(int arr[]){
    System.out.println();
    for(int i=0;i<arr.length;i++){
      System.out.print(arr[i]+"  ");
    }
    System.out.println();
    System.out.println();
  }
  public static void mergeSort(int arr[],int si,int ei){
    if(si>=ei){
      return;
    }
    int mid=(si+ei)/2;
    mergeSort(arr,si,mid);
    mergeSort(arr,mid+1,ei);
    merge(arr,si,mid,ei);
  }
  public static void merge(int arr[],int si,int mid,int ei){
    int i=si;
    int j=mid+1;
    int k=-1;
    int temp[]=new int[ei-si+1];

    while(i<=mid &&j<=ei){
      if(arr[i]>arr[j]){
        k++;
        temp[k]=arr[j];
```

```
      j++;
     }else{
      k++;
      temp[k]=arr[i];
      i++;
     }
    }
    while(i<=mid){
     k++;
      temp[k]=arr[i];
      i++;
    }
    while(j<=ei){
     k++;
      temp[k]=arr[j];
      j++;
    }

    for(i=si,k=0;i<=ei && k<temp.length;k++,i++){
     arr[i]=temp[k];
    }


  }
    public static void main(String[] args) {
      int arr[]={3,4,1,6,5,2};
      printArray(arr);
      mergeSort(arr,0,arr.length-1);
      printArray(arr);
  }
}
```

OUTPUT:

3 4 1 6 5 2

1 2 3 4 5 6