

# Experiment 18

## Quick Sort

Date of Submission 13-01-2021

**Aim:** Write a Java program that implements a Quick sort algorithm for sorting a list of names in ascending order.

**Concepts Used:** Arrays, Quick Sorting

### **Algorithm Partition(arr, start, pivot)**

Steps:

Start

i = start

j = start-1

while i < pivot do

    if arr[i] < arr[pivot] then

        j++

        swap(arr[i], arr[j])

    endif

    i++

endwhile

j = j+1

if (j != pivot)

    swap(arr[pivot], arr[j])

endif

stop

### **Algorithm QuickSort(arr, start, end)**

Steps:

Start

if start < end

    p = Partition(arr, start, end)

    Quicksort(arr, start, p-1)

    Quicksort(arr, p+1, end)

endif

### **Program code:**

```
import java.util.Scanner;

class QuickSort{
    public static void quickSort(String arr[], int s,int e){
        if(s<e){
            int q = partition(arr,s,e);
            quickSort(arr,s,q-1);
            quickSort(arr,q+1,e);
        }
    }

    static int partition(String arr[], int s, int pivot){
        String x = arr[pivot];
        int i=s-1,j=s;
        String temp;
        for(;j<pivot;j++){
            if(arr[j].compareTo(x)<=0){ //arr[j] <= arr[pivot] the switch
                i++;
                temp = arr[i];
                arr[i] = arr[j];
                arr[j] = temp;
            }
        }
        temp = arr[i+1];
        arr[i+1]=arr[pivot];
        arr[pivot] = temp;
        return i+1;
    }

    public static void main(String args[]){
        String[] arr = new String[100];
        int i = 0;

        Scanner sc = new Scanner(System.in);

        System.out.print("Enter the number of elements: ");
        int n = sc.nextInt();
        sc.nextLine();
        System.out.print("\nEnter the names to be sorted: ");

        while(i<n && sc.hasNextLine()){
            arr[i++] = sc.nextLine();
        }

        quickSort(arr,0,i-1);
        System.out.print("The sorted array is : ");
        for(int x=0;x<i;x++){
            System.out.print(arr[x]+" ");
        }
    }
}
```

```
        }  
        System.out.println("");  
    }  
}
```

**Program output:**

```
..rograming/Java/CSL203/LAB 10> javac QuickSort.java  
..rograming/Java/CSL203/LAB 10> java QuickSort  
Enter the number of elements: 4  
  
Enter the names to be sorted: Rahul  
Ravi  
Revathy  
Rohini  
The sorted array is : Rahul Ravi Revathy Rohini  
..rograming/Java/CSL203/LAB 10> java QuickSort  
Enter the number of elements: 2  
  
Enter the names to be sorted: Hector  
Eduardo  
The sorted array is : Eduardo Hector  
..rograming/Java/CSL203/LAB 10> java QuickSort  
Enter the number of elements: 5  
  
Enter the names to be sorted: Saul  
Walter  
Skylar  
Hank  
Hamlin  
The sorted array is : Hamlin Hank Saul Skylar Walter  
..rograming/Java/CSL203/LAB 10> □
```