

PHASE 1 PRACTICE ASSISTED PROJECT

8. Writing a program in Java implementing the quick sort algorithm

```
package main;

public class QuickSort {
    public static void quickSort(int[] arr, int low,
int high) {
        if (low < high) {
            // Partition the array and get the pivot
index
            int pivotIndex = partition(arr, low,
high);

            // Recursively sort the subarrays before
and after the pivot
            quickSort(arr, low, pivotIndex - 1);
            quickSort(arr, pivotIndex + 1, high);
        }
    }

    public static int partition(int[] arr, int low,
int high) {
        // Choose the rightmost element as the pivot
        int pivot = arr[high];
        int i = low - 1;

        for (int j = low; j < high; j++) {
            // If current element is smaller than or
equal to the pivot, swap it with the element at i+1
            if (arr[j] <= pivot) {
                i++;
                swap(arr, i, j);
            }
        }

        // Swap the pivot element with the element at
i+1
        swap(arr, i + 1, high);

        // Return the pivot index
        return i + 1;
    }
}
```

```

    public static void swap(int[] arr, int i, int j)
    {
        int temp = arr[i];
        arr[i] = arr[j];
        arr[j] = temp;
    }

    public static void main(String[] args) {
        int[] arr = {64, 34, 25, 12, 22, 11, 90};

        System.out.println("Original array: ");
        printArray(arr);

        quickSort(arr, 0, arr.length - 1);

        System.out.println("Sorted array: ");
        printArray(arr);
    }

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

```

OUTPUT-

```

Console ×
<terminated> QuickSort [Java Application] C:\Program Files\Java\jdk-20\bin\javaw.exe (18-May-2023, 10:17:12 am - 10:17:12 am) [pid: 19412]
Original array:
64 34 25 12 22 11 90
Sorted array:
11 12 22 25 34 64 90

```