February 27, 2019

**Assignment 1**

Design and Analysis of Algorithm

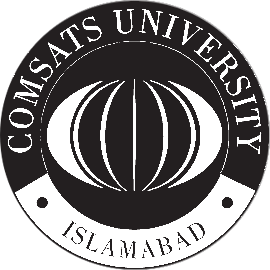
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**JAVA CODE**

package assignment.pkg1;

import java.util.Arrays;

import java.util.Scanner;

public class Assignment1 {

public static void main(String[] args) {

Scanner arrayElements = new Scanner(System.in);

System.out.print("Enter Size of Array: ");

int size = arrayElements.nextInt();

int[] A = new int[size];

System.out.println("Enter the elements of array");

for (int i = 0; i < A.length; i++) {

A[i] = arrayElements.nextInt(); }

System.out.println("The UNSORTED array elements are" + Arrays.toString(A));

int p = 0, r = size-1;

mergeSort(A, p, r);

System.out.println("The SORTED array elements are" + Arrays.toString(A) }

public static void mergeSort(int[] A, int p, int r) {

if (p < r) {

int q = (p + r) / 2;

mergeSort(A, p, q);

mergeSort(A, q + 1, r);

merge(A, p, q, r); } }

public static void merge(int[] A, int p, int q, int r) {

int n1 = q - p + 1;

int n2 = r - q;

int[] L = new int[n1 + 1];

int[] R = new int[n2 + 1];

L[n1] = Integer.MAX\_VALUE;

R[n2] = Integer.MAX\_VALUE;

for (int i = 0; i < n1; i++) {

L[i] = A[p + i];

}

for (int j = 0; j < n2; j++) {

R[j] = A[q + j + 1];

}

int x = 0, y = 0;

for (int k = p; k <= r; k++) {

if (L[x] <= R[y]) {

A[k] = L[x];

x++;

} else {

A[k] = R[y];

y++;

} } } }

