**Basics of Java Practice Exercise – Day 9**

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**1. Write a Program to sort an array of given integers using the Quick sort.**

**Input:**

**6**

**10 7 8 9 1 5**

**Output:**

**1 5 7 8 9 10**

**Code –**

**package** practiceday9;

**import** java.util.\*;

**public** **class** QuickSort {

**static** **void** swap(**int**[] array,**int** i,**int** j) {

**int** temp=array[i];

array[i]=array[j];

array[j]=temp;

}

**static** **int** partition(**int**[] array,**int** low,**int** high) {

**int** pivot=array[high];

**int** i=low-1;

**for**(**int** j=low;j<high;j++) {

**if**(array[j]<=pivot) {

i++;

*swap*(array,i,j);

}

}

*swap*(array,i+1,high);

**return** i+1;

}

**static** **void** qsort(**int**[] array,**int** low,**int** high) {

**if**(low<high) {

**int** pivot2=*partition*(array,low,high);

*qsort*(array,low,pivot2-1);

*qsort*(array,pivot2+1,high);

}

}

**static** **void** display(**int**[] array) {

**for**(**int** ele:array) {

System.***out***.println(ele);

}

}

**public** **static** **void** main(String[] args) {

Scanner sc=**new** Scanner(System.***in***);

System.***out***.println("Enter array length: ");

**int** num;

num=sc.nextInt();

**int** i;

**int** [] arr=**new** **int**[num];

System.***out***.println("\nEnter array elements: ");

**for**(i=0;i<num;i++) {

arr[i]=sc.nextInt();

}

*qsort*(arr,0,num-1);

System.***out***.println("\nSorted Array: ");

*display*(arr);

}

}

**2. Write a Program to sort an array of elements using Merge sort.**

**Input:**

**6**

**12 11 13 5 6 7**

**Output:**

**5 6 7 11 12 13**

**Code –**

**package** practiceday9;

**import** java.util.Scanner;

**public** **class** MergeSort {

**static** **void** merge(**int**[] array,**int** left,**int** mid,**int** right){

**int** num1=mid-left+1;

**int** num2=right-mid;

**int**[] leftarr=**new** **int**[num1];

**int**[] rightarr=**new** **int**[num2];

**for**(**int** i=0;i<num1;++i) {

leftarr[i]=array[left+i];

}

**for**(**int** i=0;i<num2;++i) {

rightarr[i]=array[mid+1+i];

}

**int** i=0,j=0;

**int** k=left;

**while**(i<num1 && j<num2) {

**if**(leftarr[i]<=rightarr[j]) {

array[k]=leftarr[i];

i++;

}

**else** {

array[k]=rightarr[j];

j++;

}

k++;

}

**while**(i<num1) {

array[k]=leftarr[i];

i++;

k++;

}

**while**(j<num2) {

array[k]=rightarr[j];

j++;

k++;

}

}

**static** **void** sort(**int** array[],**int** left,**int** right) {

**if**(left<right) {

**int** mid=left+(right-left)/2;

*sort*(array,left,mid);

*sort*(array,mid+1,right);

*merge*(array,left,mid,right);

}

}

**static** **void** display(**int**[] array) {

**int** n=array.length;

**for**(**int** i=0;i<n;i++) {

System.***out***.println(array[i]);

}

}

**public** **static** **void** main(String[] args) {

Scanner sc=**new** Scanner(System.***in***);

System.***out***.println("Enter array length: ");

**int** num;

num=sc.nextInt();

**int** i;

**int** [] arr=**new** **int**[num];

System.***out***.println("\nEnter array elements: ");

**for**(i=0;i<num;i++) {

arr[i]=sc.nextInt();

}

*sort*(arr,0,num-1);

System.***out***.println("\nSorted Array: ");

*display*(arr);

}

}

**3. Write a Program to find a specific element in an array of elements using Linear Search.**

**Input:**

**5**

**2 3 4 10 40**

**10**

**Output**

**Element is Present**

**Input:**

**5**

**2 3 4 10 40**

**90**

**Output**

**Element is not Present.**

**Code –**

**package** practiceday9;

**import** java.util.\*;

**public** **class** LinearSearch {

**public** **static** **void** main(String[] args) {

Scanner sc=**new** Scanner(System.***in***);

System.***out***.println("Enter array length: ");

**int** num;

num=sc.nextInt();

**int** i;

**int** [] arr=**new** **int**[num];

System.***out***.println("\nEnter array elements: ");

**for**(i=0;i<num;i++) {

arr[i]=sc.nextInt();

}

System.***out***.println("\nEnter Element to find: ");

**int** input=sc.nextInt();

**int** temp=0;

**for**(i=0;i<num;i++) {

**if**(input==arr[i]) {

temp=1;

**break**;

}

}

**if**(temp==1) {

System.***out***.println("\nElement Found");

}

**else** {

System.***out***.println("\nElement Not Found");

}

}

}

**4. Write a Program to sort an array of strings using selection sort.**

**Input:**

**banana apple orange grape kiwi**

**Output**

**apple banana grape kiwi orange**

**Code –**

**package** practiceday9;

**import** java.util.\*;

**public** **class** SelectionSort {

**static** **void** sort(String[] arr) {

**int** num=arr.length;

**for**(**int** i=0;i<num;i++) {

**int** min=i;

**for**(**int** j=i+1;j<num;j++) {

**if**(arr[j].compareTo(arr[min])<0) {

min=j;

}

}

String temp=arr[min];

arr[min]=arr[i];

arr[i]=temp;

}

}

**static** **void** display(String[] arr) {

**for**(String item:arr) {

System.***out***.println(item);

}

}

**public** **static** **void** main(String[] args) {

Scanner sc=**new** Scanner(System.***in***);

System.***out***.println("Enter array length: ");

**int** num;

num=sc.nextInt();

**int** i;

String [] arr=**new** String[num];

System.***out***.println("\nEnter array elements: ");

**for**(i=0;i<num;i++) {

arr[i]=sc.next();

}

*sort*(arr);

System.***out***.println("\nSorted Array: ");

*display*(arr);

}

}

**5. Write a Program to sort an array of floating-point numbers using insertion sort.**

**Input:**

**12.5 11.0 13.2 5.7 6.1**

**Output**

**5.7 6.1 11.0 12.5 13.2**

**Code –**

**package** practiceday9;

**import** java.util.\*;

**public** **class** InsertionSort {

**static** **void** sort(Float[] arr) {

**int** num=arr.length;

**for**(**int** i=0;i<num;i++) {

**float** key=arr[i];

**int** j=i-1;

**while**(j>=0 && arr[j]>key) {

arr[j+1]=arr[j];

j=j-1;

}

arr[j+1]=key;

}

}

**static** **void** display(Float[] arr) {

**for**(**float** item:arr) {

System.***out***.println(item);

}

}

**public** **static** **void** main(String[] args) {

Scanner sc=**new** Scanner(System.***in***);

System.***out***.println("Enter array length: ");

**int** num;

num=sc.nextInt();

**int** i;

Float [] arr=**new** Float[num];

System.***out***.println("\nEnter array elements: ");

**for**(i=0;i<num;i++) {

arr[i]=sc.nextFloat();

}

*sort*(arr);

System.***out***.println("\nSorted Array: ");

*display*(arr);

}

}

**6. Implement binary search to find a specified string within a sorted array of strings.**

**Input:**

**apple banana grape orange pear strawberry**

**orange**

**Output**

**Element orange found at index 3**

**Input:**

**apple banana grape orange pear strawberry**

**kiwi**

**Output**

**Element kiwi not founds**

**Code –**

**package** practiceday9;

**import** java.util.\*;

**public** **class** BinarySearch {

**static** **int** search(String[] arr,String ele) {

**int** left=0;

**int** right=arr.length-1;

**while**(left<=right) {

**int** mid=left+(right-left)/2;

**int** temp=ele.compareTo(arr[mid]);

**if**(temp==0) {

**return** mid;

}

**if**(temp>0) {

left=mid+1;

}

**else** {

right=mid-1;

}

}

**return** -1;

}

**public** **static** **void** main(String[] args) {

Scanner sc=**new** Scanner(System.***in***);

System.***out***.println("Enter array length: ");

**int** num;

num=sc.nextInt();

**int** i;

String [] arr=**new** String[num];

System.***out***.println("\nEnter array elements: ");

**for**(i=0;i<num;i++) {

arr[i]=sc.next();

}

System.***out***.println("\nEnter element to search: ");

String str=sc.next();

**int** result=*search*(arr,str);

**if**(result==-1) {

System.***out***.println("\nElement "+str+" not found");

}

**else** {

System.***out***.println("\nElement "+str+" found at index "+result);

}

}

}