**Programs For Revision**

**Q1. Bubble Sort**

**package** SortingAlgorithms;

**import** java.util.Scanner;

**public** **class** BubbleSort {

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

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

System.***out***.println("Enter the size of the array: ");

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

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

**int** array[] = **new** **int**[size];

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

array[i]= *sc*.nextInt();

}

*bubbleSort*(array);

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

System.***out***.print(i+" ");

}

}

**private** **static** **void** bubbleSort(**int**[] array) {

**int** temp=0;

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

**for**(**int** j=0;j<array.length-i-1;j++) {

**if**(array[j]>array[j+1]) {

temp = array[j];

array[j] = array[j+1];

array[j+1] = temp;

}

}

}

}

}

**OutPut:**

Enter the size of the array:

7

Enter the elements of the array:

23

89

1

8

32

0

13

The sorted array is:

0 1 8 13 23 32 89

**Q2. Selection Sort**

**import** java.util.Scanner;

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

/\* in selection Sort ,1st we select the minimum

\* index and then we swap it with the 1st unsorted

\* element

\* \*/

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

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

System.***out***.println("Enter the size of the array: ");

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

**int** array[]= **new** **int**[n];

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

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

array[i]=*sc*.nextInt();

}

**int** min\_idx,temp;

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

min\_idx = i;

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

**if**(array[min\_idx]>array[j]){

min\_idx =j;

}

}

temp = array[min\_idx];

array[min\_idx] = array[i];

array[i]=temp;

}

System.***out***.println("The sorted array is: ");

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

System.***out***.print(array[i]+" ");

}

}

}

**OutPut:**

Enter the size of the array:

7

Enter the elements of the array:

23

45

65

1

9

13

6

The sorted array is:

1 6 9 13 23 45 65

**Q3. Insertion Sort**

**import** java.util.Scanner;

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

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

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

System.***out***.println("Enter the size of the array: ");

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

**int** array[]= **new** **int**[n];

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

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

array[i]=*sc*.nextInt();

}

*insertionSort*(array,n);

System.***out***.println("Sorted elements are: ");

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

System.***out***.print(array[i]+" ");

}

}

**private** **static** **void** insertionSort(**int** array[],**int** n) {

**int** key,j;

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

key=array[i];

j = i-1;

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

array[j+1]=array[j];

j=j-1;

}

array[j+1]=key;

}

}

}

**OutPut:**

Enter the size of the array:

5

Enter the elements of the array:

1

7

9

3

2

Sorted elements are:

1 2 3 7 9

**Q4. Quick Sort**

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

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

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

System.***out***.println("Enter the size of the array: ");

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

**int** array[]= **new** **int**[n];

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

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

array[i]=*sc*.nextInt();

}

*quickSort*(array,0,n-1);

System.***out***.println("Sorted elements are: ");

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

System.***out***.print(array[i]+" ");

}

}

**private** **static** **void** quickSort(**int** array[],**int** l,**int** h) {

**int** pivot = l;

**int** i = l+1;

**int** j = h;

**int** temp;

**if**(l<h) {

**while**(i<j) {

**while**( i<=h && array[i]<array[pivot]) {

i++;

}

**while**(array[j]>array[pivot]) {

j--;

}

**if**(i<j) {

temp = array[i];

array[i] = array[j];

array[j] = temp;

}

}

temp = array[pivot];

array[pivot] = array[j];

array[j] = temp;

*quickSort*(array,l,j-1);

*quickSort*(array,j+1,h);

}

}

}

**Output:**

Enter the size of the array:

5

Enter the elements of the array:

98

23

14

56

1

Sorted elements are: 1 14 23 56 98

**Q5. Merge Sort**

**import** java.util.Scanner;

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

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

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

System.***out***.println("Enter the size of the array: ");

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

**int** array[]= **new** **int**[n];

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

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

array[i]=*sc*.nextInt();

}

*mergeSort*(array,0,n-1);

System.***out***.println("Sorted elements are: ");

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

System.***out***.print(array[i]+" ");

}

}

**private** **static** **void** mergeSort(**int** array[],**int** l,**int** h) {

**int** mid;

**if**(l>=h)

**return**;

mid = (l+h)/2;

*mergeSort*(array,l,mid);

*mergeSort*(array,mid+1,h);

*merge*(array,l,mid,h);

}

**private** **static** **void** merge(**int** array[],**int** l,**int** mid,**int** h) {

**int** p1 = l,p2 = mid+1,i=0;

**int** realArray[] = **new** **int**[h-l+1];

**while**(p1<=mid && p2<=h ) {

**if**(array[p1]<=array[p2]) {

realArray[i] = array[p1];

i++;

p1++;

}

**if**(array[p1]>array[p2]) {

realArray[i] = array[p2];

i++;

p2++;

}

}

**while**(p1<=mid) {

realArray[i]=array[p1];

i++;

p1++;

}

**while**(p2<=h) {

realArray[i]=array[p2];

i++;

p2++;

}

**int** k=0;

**for**(**int** x=l;x<=h;x++) {

array[x]=realArray[k];

k++;

}

}

}

**OutPut:** Enter the size of the array: 5

Enter the elements of the array: 12 56 89 23 4

Sorted elements are: 4 12 23 56 89

**Q6. Binary Search**

**import** java.util.Scanner;

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

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

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

System.***out***.println("Enter the size of the array: ");

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

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

**int** array[] = **new** **int**[n];

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

array[i]= *sc*.nextInt();

}

System.***out***.println("Enter the element that you want to search in the array: ");

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

*binarySearch*(array,n,k);

}

**private** **static** **void** binarySearch(**int** array[],**int** n,**int** k) {

**int** mid;

**int** low=0,high=n-1;

**while**(low<=high) {

mid = (low+high)/2;

**if**(array[mid]==k) {

System.***out***.print("Element is present at "+mid+" position");

**break**;

}

**else** **if**(array[mid]>k) {

high = mid-1;

}

**else** {

low = mid+1;

}

}

**if**(low>high) {

System.***out***.print("Element is not present");

}

}

}

**Output:**

Enter the size of the array: 5

Enter the elements of the array; 1 2 3 4 5

Enter the element that you want to search in the array: 7

Element is not present

**Q7.Linear Search**

**import** java.util.Scanner;

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

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

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

System.***out***.println("Enter the size of the array: ");

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

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

**int** array[] = **new** **int**[n];

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

array[i]= *sc*.nextInt();

}

System.***out***.println("Enter the element that you want to search in the array: ");

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

*linearSearch*(array,n,k);

}

**private** **static** **void** linearSearch(**int**[] array, **int** n, **int** k) {

**int** idx = array[0];

**boolean** flag = **false**;

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

**if**(array[i]==k) {

flag = **true**;

}

}

**if**(flag == **true**) {

System.***out***.println("Element found");

}

**else** {

System.***out***.println("Element not found");

}

}

}

**OutPut:**

Enter the size of the array:

5

Enter the elements of the array;

2

8

89

34

67

Enter the element that you want to search in the array:

67

Element found

**Q3. Buy and Sell problem:**

**import** java.util.Scanner;

**public** **class** BuyAndSell {

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

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

System.***out***.println("Enter the size of the element:");

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

**int** array[] = **new** **int**[n];

System.***out***.println("Enter the element:");

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

array[i]=*sc*.nextInt();

}

**int** min = Integer.***MAX\_VALUE***;

**int** max = Integer.***MIN\_VALUE***;

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

**if**(array[i]<min) {

min=array[i];

}

**if**((array[i]-min)>max) {

max = array[i]-min;

}

}

System.***out***.println("max profit: "+max);

}

}

**OutPut:**

Enter the size of the element:

5

Enter the element:

3

5

8

23

34

max profit: 31

**Q4. Calculater**

**import** java.util.Scanner;

**public** **class** Calculater {

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

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

System.***out***.println("Enter two numbers to perform the operation: ");

**int** num1 = *sc*.nextInt();

**int** num2 = *sc*.nextInt();

System.***out***.println("Enter the operator(+,-,\*,/,%); ");

**char** op = *sc*.next().charAt(0);

**double** ans = 0;

**switch**(op) {

**case** '+':

ans = num1 + num2;

**break**;

**case** '-':

ans = num1 - num2;

**break**;

**case** '\*':

ans = num1 \* num2;

**break**;

**case** '/':

ans = num1 / num2;

**break**;

**case** '%':

ans = num1 % num2;

**break**;

**default**:

System.***out***.println("you have entered wrong operator: ");

**break**;

}

System.***out***.println(num1 + " "+op+" "+num2+" = "+ans);

}

}

**OutPut:**

Enter two numbers to perform the operation:

7

9

Enter the operator(+,-,\*,/,%);

\*

7 \* 9 = 63.0

**Q5. Count the number of even and odd numbers in the array**

**import** java.util.Scanner;

**public** **class** EvenAndOddCount {

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

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

System.***out***.print("Enter the size: ");

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

**int** array[] = **new** **int**[size];

**int** countEven=0,countOdd=0;

System.***out***.print("Enter the elements of the array:");

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

array[i]=*sc*.nextInt();

}

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

**if**(array[i]%2==0) {

countEven++;

}

**else** {

countOdd++;

}

}

System.***out***.print("Even count : "+countEven+"\nOdd count :"+countOdd);

}

}

**OutPut:**

Enter the size: 5

Enter the elements of the array:7

8

9

5

3

Even count : 1

Odd count :4

**Q6. Print the elements in the even position of an array**

**import** java.util.Scanner;

**public** **class** EvenPositionEleInArray {

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

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

// **TODO** Auto-generated method stub

System.***out***.println("Enter the size of the array:");

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

**int** array[]=**new** **int**[size];

System.***out***.println("Enter the elements in the array:");

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

array[i]= *sc*.nextInt();

}

System.***out***.println("Even positioned elements of the array:");

**for**(**int** i=2;i<size;i+=2) {

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

}

}

}

**OutPut:**

Enter the size of the array:

7

Enter the elements in the array:

1

2

3

4

5

6

7

Even positioned elements of the array:

3

5

7

**Q7**. Read an array of integers and an integer which is the length of a subarray. The second input need to be seperately stored. The second input specifies the length within which we have to check for the duplicates. If the current index value is 1, within the next 3 postions, ie., 2,3 and 4, we should not have any duplicates. If there are duplicates, display true. else display false.

**Sample Input**: 1 2 3 1 2

**Sample Output**: true

**import** java.util.Scanner;

**public** **class** FindDuplicateSubarray {

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

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

**int** array[] =**new** **int**[100];

**int** i=0;

**while**(*sc*.hasNext()){

array[i]=*sc*.nextInt();

i++;

}

**int** l = array[i-1];

**boolean** flag=**false**;

array[i-1]=00;

**for**(**int** k=0;k<i-1;k++) {

**for**(**int** q=k+1;q<l;q++) {

**if**(array[k]==array[q]) {

System.***out***.print("true");

**break**;

}

}

}

**if**(flag == **false**) {

System.***out***.print("false");

}

}

}

**Q8. Find Duplicate element**

**import** java.util.Scanner;

**public** **class** FirstDuplicateElement {

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

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

System.***out***.println("Enter the size:");

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

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

**int** array[] = **new** **int**[size];

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

array[i]= *sc*.nextInt();

}

**boolean** flag = **false**;

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

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

**if**(array[i]==array[j]) {

System.***out***.println(" duplicate element is "+ array[i]);

flag = **true**;

**break**;

}

}

}

**if**(flag == **false**) {

System.***out***.println("No duplicate elements");

}

}

}

**output:**

Enter the elements of the array:

1

2

4

5

1

4

6

duplicate element is 1

duplicate element is 4

**Q9.First element ,last element and Sum of the elements in the array:**

**import** java.util.Scanner;

**public** **class** FirstLastAndSum {

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

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

System.***out***.println("Enter the number:");

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

**int** org\_num = num;

**int** first = 0;

**int** last=num%10;

**int** sum=0;

**while**(num>0) {

first = num %10;

sum += first;

num = num/10;

}

System.***out***.println(" first: "+ first +" last: "+last+" sum: "+sum);

}

}

**OutPut:**

Enter the number:

710221

first: 7 last: 1 sum: 13

**Q.10 Inserting value at a location in the array**

**import** java.util.Scanner;

**public** **class** InsertAtPosition {

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

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

System.***out***.println("Enter the size of the array:");

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

**int** array[]=**new** **int**[size];

System.***out***.println("Enter the elements in the array:");

**for**(**int** i=0;i<size-1;i++) {

array[i]=*sc*.nextInt();

}

System.***out***.println("Enter the location at which you want to insert the value:");

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

System.***out***.println("Enter the value which you want to insert:");

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

**for**(**int** i=array.length-1;i>location;i--) {

array[i]=array[i-1];

}

array[location]=value;

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

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

}

}

}

**OutPut:**

Enter the size of the array:

5

Enter the elements in the array:

7

8

9

2

Enter the location at which you want to insert the value:

2

Enter the value which you want to insert:

6

7

8

6

9

2

**Q11. Infix to PostFix**

**import** java.util.Stack;

**import** java.util.Scanner;

**import** java.lang.String;

**class** InfixToPostfix {

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

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

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

String str;

String result;

Stack s = **new** Stack();

**while**(i>0) {

str = *sc*.next();

result="";

**for**(**int** j=0;j<str.length();j++) {

**char** ch = str.charAt(j);

**switch**(ch) {

**case** '(': **break**;

**case** '+':s.push(ch);

**break**;

**case** '-':s.push(ch);

**break**;

**case** '\*':s.push(ch);

**break**;

**case** '/':s.push(ch);

**break**;

**case** '^':s.push(ch);

**break**;

**case** ')':result +=s.pop();

**break**;

**default** : result += ch;

**break**;

}

}

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

i--;

}

}

}

**OutPut:**

2

(a+b)

ab+

(a\*b)

ab\*