**Array coding question : 1. Find the Largest and Smallest Element**

* **Given an array, find the smallest and largest elements in it.**

**Code:-**

import java.util.Scanner;

class Q1LargeElement{

static int largest(int[] arr){

System.out.println("large no");

int max=arr[0];

for(int i=1;i<arr.length;i++){

if(arr[i]>max){

max=arr[i];}

}

return max;

}

static int smallest(int[] arr){

System.out.println("small no");

int min=arr[0];

for(int i=1;i<arr.length;i++){

if(arr[i]<min){

min=arr[i];}

}

return min;

}

public static void main(String[] args){

Scanner sc= new Scanner(System.in);

int arr[]=new int[3];

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

System.out.println("enter no: " );

arr[i] = sc.nextInt();

}

System.out.println(largest(arr));

System.out.println(smallest(arr));

}

}

**Output:-**

D:\cdac25\all assignment\java\assignment3>java Q1LargeElement.java

enter no:

5

enter no:

6

enter no:

5

large no

6

small no

5

**2. Find the Second Largest Element ○ Find the second-largest element in the given array.**

**Code :-**

import java.util.\*;

class Q3SecLarge {

static int seclarge(int arr[]) {

int n = arr.length;

Arrays.sort(arr);

for (int i = n - 2; i >= 0; i--) {

if (arr[i] != arr[n - 1]) {

return arr[i];

}

}

return -1;

}

public static void main(String[] args) {

Scanner sc = new Scanner(System.in);

int arr[] = new int[4];

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

System.out.println("Enter number " );

arr[i] = sc.nextInt();

}

int secondLargest = seclarge(arr);

if (secondLargest != -1) {

System.out.println("The second largest element is: " + secondLargest);

} else {

System.out.println("There is no second largest element.");

}

sc.close();

}

}

**Output:-**

D:\cdac25\all assignment\java\assignment3>java Q3SecLarge

Enter number

4

Enter number

6

Enter number

8

Enter number

9

The second largest element is: 8

**3. Count Even and Odd Numbers**

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

import java.util.Scanner;

class EvenOdd{

public static void main(String[] args){

Scanner sc=new Scanner(System.in);

int arr[]=new int[5];

for(int i=0;i<5;i++){

System.out.println("enter no: ");

arr[i] = sc.nextInt();

}

for(int i=0;i<5;i++){

System.out.println(arr[i]);

if(arr[i] %2==0){

System.out.println("even no: ");}

else{

System.out.println("Odd no : ");}

}

}

}

**4. Find Sum and Average ○ Compute the sum and average of all elements in the array.**

**Code :-**

class SumAvg{

public static void main(String[] args){

int arr[]={1,4,3,5,6};

int sum=0;

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

sum=sum+arr[i];

System.out.println();

}

double average = (double) sum / arr.length;

System.out.println("Sum of the elements: " + sum);

System.out.println("Average of the elements: " + average);

}}

**Output:-**

Sum of the elements: 19

Average of the elements: 3.8

**5. Count Even and Odd Numbers**

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

import java.util.Scanner;

class CountEO{

public static void main(String[] args){

Scanner sc= new Scanner(System.in);

int a[]=new int[5];

for(int i=0;i<5;i++){

System.out.print("enter no : ");

a[i]=sc.nextInt();}

int CountEven=0;

int CountOdd=0;

for(int i=0;i<5;i++){

System.out.println(a[i]);

if(a[i] %2==0){

CountEven++;

}

else{

CountOdd++;

}}

System.out.println("even no: " + CountEven);

System.out.println("odd no: " + CountOdd);

}}

**Output:-**

D:\cdac25\all assignment\java\assignment3>java CountEo.java

enter no : 6

enter no : 8

enter no : 23

enter no : 44

enter no : 55

6

8

23

44

55

even no: 3

odd no: 2

**6. Remove Duplicates from a Sorted Array ○ Remove duplicate elements from a sorted array without using extra space. 7. Rotate an Array ○ Rotate the array to the right by k positions. 8. Merge Two Sorted Arrays ○ Merge two sorted arrays into a single sorted array without using extra space. 9. Find Missing Number in an Array ○ Given an array of size n-1 containing numbers from 1 to n, find the missing number. 10. Find Intersection and Union of Two Arrays ○ Find the intersection and union of two unsorted arrays. 11. Find a Subarray with Given Sum ○ Given an array of integers, find the subarray that sums to a given value S.**

**12. Write a program to accept 20 integer numbers in a single Dimensional Array. Find and Display the following:**

* **Number of even numbers.**
* **Number of odd numbers.**
* **Number of multiples of 3**

import java.util.Scanner;

class Q12EO{

public static void main(String[] args){

Scanner sc=new Scanner(System.in);

int arr[]=new int[20];

for(int i=0;i<20;i++){

System.out.println("enter no: ");

arr[i] = sc.nextInt();

}

int evenCount=0;

int oddCount=0;

int mulofthreee=0;

for(int i=0;i<20;i++){

System.out.println(arr[i]);

if(arr[i] %2==0){

evenCount++;}

else{

oddCount++;}

if(arr[i] %3==0){

mulofthreee++;}

}

System.out.println("Number of even numbers: " + evenCount);

System.out.println("Number of odd numbers: " + oddCount);

System.out.println("Number of multiples of 3 : " + mulofthreee);

}

}

**Output:-**

D:\cdac25\all assignment\java\assignment3>java Q12EO.java

enter no:

4

enter no:

5

enter no:

6

enter no:

3

enter no:

2

enter no:

4

enter no:

6

enter no:

7

enter no:

22

enter no:

44

enter no:

77

enter no:

55

enter no:

44

enter no:

22

enter no:

13

enter no:

65

enter no:

098

enter no:

76

enter no:

567

enter no:

88

4

5

6

3

2

4

6

7

22

44

77

55

44

22

13

65

98

76

567

88

Number of even numbers: 12

Number of odd numbers: 8

Number of multiples of 3 : 4

**13. Write a program to accept the marks in Physics, Chemistry and Maths secured by 20 class students in a single Dimensional Array. Find and display the following:**

* **Number of students securing 75% and above in aggregate.**
* **Number of students securing 40% and below in aggregate.**

**14. Write a program in Java to accept 20 numbers in a single dimensional array arr[20]. Transfer and store all the even numbers in an array even[ ] and all the odd numbers in another array odd[ ]. Finally, print the elements of the even & the odd array. 15. Write a Java program to print all sub-arrays with 0 sum present in a given array of integers. Example: Input : nums1 = { 1, 3, -7, 3, 2, 3, 1, -3, -2, -2 } nums2 = { 1, 2, -3, 4, 5, 6 } nums3= { 1, 2, -2, 3, 4, 5, 6 } Output: Sub-arrays with 0 sum : [1, 3, -7, 3] Sub-arrays with 0 sum : [3, -7, 3, 2, 3, 1, -3, -2] Sub-arrays with 0 sum : [1, 2, -3] Sub-arrays with 0 sum : [2, -2] CDAC Mumbai 16. Given two sorted arrays A and B of size p and q, write a Java program to merge elements of A with B by maintaining the sorted order i.e. fill A with first p smallest elements and fill B with remaining elements. Example: Input : int[] A = { 1, 5, 6, 7, 8, 10 } int[] B = { 2, 4, 9 } Output: Sorted Arrays: A: [1, 2, 4, 5, 6, 7] B: [8, 9, 10] 17. Write a Java program to find the maximum product of two integers in a given array of integers. Example: Input : nums = { 2, 3, 5, 7, -7, 5, 8, -5 } Output: Pair is (7, 8), Maximum Product: 56 18. Print a Matrix ○ Given an m x n matrix, print all its elements row-wise. 19. Transpose of a Matrix ○ Given a matrix, return its transpose (swap rows and columns).**

**20. Sum of Two Matrices**

* **Given two matrices of the same size, compute their sum.**

class Sum{

public static void main(String[] args){

int a[][]={{4,5,6},{5,6,8},{5,8,9}};

for(int i=0;i<3;i++){

for(int j=0;j<3;j++)

System.out.print(a[i][j]+ " ");

System.out.println();}

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

int b[][]={{4,5,6},{5,6,8},{5,8,9}};

for(int i=0;i<3;i++){

for(int j=0;j<3;j++)

System.out.print(b[i][j]+ " ");

System.out.println();}

System.out.println("Addition of two matrix is:");

int add[][]=new int[a.length][a[0].length];;

for(int i=0;i<3;i++){

for(int j=0;j<3;j++)

add[i][j]=a[i][j]+b[i][j]; }

for(int i=0;i<3;i++){

for(int j=0;j<3;j++)

System.out.print(add[i][j]+ " ");

System.out.println();}

} }

**Output:-**

4 5 6

5 6 8

5 8 9

...

4 5 6

5 6 8

5 8 9

Addition of two matrix is:

8 10 12

10 12 16

10 16 18

**21. Row-wise and Column-wise Sum**

* **Find the sum of each row and each column of a given matrix.**

class AddArray{

public static void main(String[] args){

int a[][]={{1,2},{2,3},{6,8}};

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

for(int j=0;j<a[0].length;j++)

System.out.print(a[i][j]+" ");

System.out.println();}

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

int b[][]={{1,2},{2,3},{6,8}};

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

for(int j=0;j<a[0].length;j++)

System.out.print(b[i][j]+" ");

System.out.println();}

System.out.println();

System.out.println("addition of two matrix");

int add[][] = new int[a.length][a[0].length];

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

for(int j=0;j<a[0].length;j++)

add[i][j]=a[i][j]+b[i][j];}

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

for(int j=0;j<a[0].length;j++){

System.out.print(add[i][j]+" ");}

System.out.println();}

}}

Output:-

D:\cdac25\all assignment\java\assignment3>java AddArray.java

1 2

2 3

6 8

......

1 2

2 3

6 8

addition of two matrix

2 4

4 6

12 16

**22. Find the Maximum Element in a Matrix**

* **Find the largest element in a given matrix.**

class Largestnum{

static int Largeno(int[] x){

System.out.println("Large no: ");

int max=x[0];

for(int i=1;i<x.length;i++){

if(x[i]>max){

max=x[i];}

}

return max;

}

public static void main(String[] args){

int x[]={2,5,7,98,23,56,22};

System.out.println(Largeno(x));

}}

**Output:-**

D:\cdac25\all assignment\java\assignment3>java Largestnum

Large no:

98

**23. Matrix Multiplication**

* **Multiply two matrices and return the resultant matrix.**

class Multiply{

public static void main(String[] args){

System.out.println("first matrix");

int a[][]={{2,3},{5,6}};

for(int i=0;i<2;i++){

for(int j=0;j<2;j++)

System.out.print(a[i][j]+" ");

System.out.println();}

System.out.println("second matrix");

int b[][]={{5,7},{7,9}};

for(int i=0;i<2;i++){

for(int j=0;j<2;j++)

System.out.print(b[i][j]+" ");

System.out.println();}

System.out.println("multiplication of matrix");

int mul[][]= new int[2][2];

for(int i=0;i<2;i++){

for(int j=0;j<2;j++){

mul[i][j] = 0;

for (int k = 0; k < 2; k++) {

mul[i][j] += a[i][k] \* b[k][j];

mul[i][j]=a[i][j]\*b[i][j];}

}}

for(int i=0;i<2;i++){

for(int j=0;j<2;j++)

System.out.print(mul[i][j]+" ");

System.out.println();}

}

}

**Output:-**

D:\cdac25\all assignment\java\assignment3>java Multiply

first matrix

2 3

5 6

second matrix

5 7

7 9

multiplication of matrix

10 21

35 54

24. Rotate a Matrix by 90 Degrees ○ Rotate a given N x N matrix by 90 degrees clockwise. 25. Find the Diagonal Sum ○ Compute the sum of both diagonals in a square matrix. CD