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## WEEK 1

1. Sum of Two Numbers: Write a program that takes two integers from the user and prints their sum.

JAVA.

```
package Week_1;

import java.util.Scanner;

class Ques1 {

    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        double num1;
        double num2;
        double result;
        System.out.println("Enter First Number : ");
        num1 = scanner.nextDouble();
        System.out.println("Enter Second Number : ");
        num2 = scanner.nextDouble();
        scanner.close();
        result = num1 + num2;
        System.out.println("SUM IS = "+result);
    }
}
```

2. Even or Odd: Write a program to check whether a given number is even or odd.

JAVA

```
package Week_1;

import java.util.Scanner;

public class Ques2 {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        int num;
        System.out.print("Enter a Number : ");
        num = scanner.nextInt();
        scanner.close();
        int rem;
        rem = num%2;
        if(rem == 0){
            System.out.println("Number "+num+" is Even Number");
        }
        else{
            System.out.println("Number "+num+" is Odd Number");
        }
    }
}
```

3. Largest of Three Numbers: Write a program to find the largest of three numbers.

## JAVA

```
package Week_1;

import java.util.Scanner;

public class Ques3 {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        int num1,num2,num3;
        System.out.print("Enter first Number : ");
        num1 = scanner.nextInt();
        System.out.print("Enter second Number : ");
        num2 = scanner.nextInt();
        System.out.print("Enter third Number : ");
        num3 = scanner.nextInt();
        scanner.close();
        if(num1==num2&& num2==num3){
            System.out.println("All numbers are EQUAL!");
        }
        else if(num1>num2 && num1 > num3){
            System.out.println("Number "+num1+" is Greatest");
        }
        else if (num2>num1 && num2>num3) {
            System.out.println("Number "+num2+" is Greatest");
        }
        else {
            System.out.println("Number "+num3+" is Greatest");
        }
    }
}
```

4. Simple Calculator: Write a program to create a simple calculator that can add, subtract, multiply, and divide two numbers.

## JAVA

```
package Week_1;

import java.util.Scanner;

public class Ques4 {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        double a,b;
        int op;
        boolean cond = true;
        while (cond) {
            System.out.print("Enter First numer : ");
            a = scanner.nextInt();
            System.out.print("Enter second numer : ");
            b = scanner.nextInt();
            System.out.println("1. for add\n2. Subtract\n3. Multiply\n4. Divide");
            System.out.println("5. Exit");
            System.out.print("Enter your Opeartion() : ");
            op = scanner.nextInt();
            if (op == 5) {
                cond = false;
            }
            else if (op == 1) {
```

```
        System.out.println("Sum = "+(a+b));
    }
    else if (op == 2) {
        System.out.println("Subtraction = "+(a-b));
    }
    else if (op == 3) {
        System.out.println("Multiplication = "+(a*b));
    }
    else if (op == 4) {
        System.out.println("Division = "+(a/b));
    }
    else
    {
        System.out.println("Please Enter Correct Number!!");
    }
}
scanner.close();
}
```

5. Leap Year Check: Write a program to check whether a given year is a leap year.

JAVA

```
package Week_1;

import java.util.Scanner;

public class Ques5 {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        int year;
        System.out.print("Enter year : ");
        year = scanner.nextInt();
        if(year%4 == 0){
            System.out.println(year+" is a Leap year");
        }else{
            System.out.println(year+" is Not a Leap year");
        }
        scanner.close();
    }
}
```

## WEEK 2

1. Fibonacci Sequence: Write a program to print the first 10 numbers of the Fibonacci sequence.

JAVA

```
package Week_2;

public class Ques1 {
    public static void main(String[] args) {
        int a = 0;
        int b = 1;
        int c;
        System.out.print("Series : "+a+" "+b);
        for(int i = 2; i<10;i++){
            c = a+b;
            System.out.print(" "+c);
            a=b;
            b=c;
        }
        System.out.println();
    }
}
```

2. Factorial of a Number: Write a program to calculate the factorial of a given number.

JAVA

```
package Week_2;

import java.util.Scanner;

public class Ques2 {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        int a;
        int b = 1;
        System.out.print("Enter a Number : ");
        a = scanner.nextInt();
        scanner.close();
        for(int i=2;i<=a;i++){
            b=b*i;
        }
        System.out.println("Factorial = " +b);
    }
}
```

3. Prime Number Check: Write a program to check whether a given number is prime or not.

JAVA

```
package Week_2;

import java.util.Scanner;
```

```
public class Ques3 {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        int num1, rem;
        System.out.print("Enter a Number : ");
        num1 = scanner.nextInt();
        scanner.close();
        int num2 = num1/2;
        for(int i = 2; i<=num2; i++){
            rem = num1 % i;
            if(rem == 0){
                System.out.println(num1+" is Not Prime Number");
                break;
            }
            else if (rem != 0 && i == num2) {
                System.out.println(num1+" is a Prime Number");
            }
        }
    }
}
```

4. Reverse a Number: Write a program to reverse the digits of a given number.

JAVA

```
package Week_2;

import java.util.Scanner;

public class Ques4 {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        int num,rem;
        System.out.print("Enter a Number : ");
        num = scanner.nextInt();
        scanner.close();
        System.out.print("Revese Number is : ");
        while(num !=0){
            rem = num % 10;
            num = num / 10;
            System.out.print(rem);
        }
        System.out.println();
    }
}
```

5. Palindrome Check: Write a program to check if a given string or number is a palindrome.

JAVA

```
package Week_2;

import java.util.Scanner;

public class Ques5 {
    public static void main(String[] args) {
```

```
Scanner scanner = new Scanner(System.in);
String string;
System.out.print("Enter a String : ");
string = scanner.nextLine();
scanner.close();
boolean cond = true;
for (int i = 0; i < string.length() / 2; i++) {

    if (string.charAt(i) == string.charAt(string.length() - i - 1)) {
        cond = true;
    } else {
        cond = false;
        break;
    }

}
if (cond) {
    System.out.println(string + " is Palindrome");
} else {
    System.out.println(string + " is Not palindrome");
}
}
```



## WEEK 3

1. Binary to Decimal Conversion: Write a program to convert a binary number to its decimal equivalent.

JAVA

```
package Week_3;

import java.util.Scanner;
import java.lang.Math;;

public class Ques1 {
    public static void main(String[] args) {
        int num, i=0, rem, sum = 0;
        Scanner scanner = new Scanner(System.in);
        System.out.println("Enter Binary Number : ");
        num = scanner.nextInt();
        scanner.close();
        while(num != 0){
            rem = num % 10;
            num = num / 10;
            if(rem > 1){
                System.out.println("Not a Binary Number!");
                break;
            }
            sum = (int) (sum + rem * Math.pow(2, i));
            i++;
        }
        System.out.println("Decimal Number is : "+sum);
    }
}
```

2. Decimal to Binary Conversion: Write a program to convert a decimal number to its binary equivalent.

JAVA

```
package Week_3;
import java.util.Scanner;
public class Ques2 {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        int num;
        int rem;
        String emp_String = "";
        System.out.print("Enter a numbeer : ");
        num = scanner.nextInt();
        scanner.close();
        while(num != 0){
            rem = num % 2;
            num = num / 2;
            emp_String = rem + emp_String;
        }
        System.out.println("Binary Format = "+emp_String);
    }
}
```

3. Count Vowels and Consonants: Write a program to count the number of vowels and consonants in a given string.

JAVA

```
package Week_3;

import java.util.Scanner;

public class Ques3 {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        String string;
        int j=0;
        int k = 0;
        System.out.println("Enter a String : ");
        string = scanner.nextLine();
        scanner.close();
        for(int i = 0; i < string.length(); i++){
            if(string.charAt(i) == 'a' || string.charAt(i) == 'e'
                || string.charAt(i) == 'i' || string.charAt(i) == 'o' ||
string.charAt(i) == 'u' ){
                k++;
            } else {
                j++;
            }
        }
        System.out.println("Number of vowels = "+k);
        System.out.println("Number of Consonants = "+j);
    }
}
```

4. Sum of Digits: Write a program to calculate the sum of the digits of a given number.

JAVA

```
package Week_3;

import java.util.Scanner;

public class Ques4 {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        int num, rem;
        int sum = 0;
        System.out.print("Enter a number : ");
        num = scanner.nextInt();
        scanner.close();
        while(num != 0){
            rem = num % 10;
```

```
        num = num / 10;
        sum = sum + rem;
    }
    System.out.println("Sum of Number = "+sum);
}
}
```

6. Write a program to find the HCF and LCM of two numbers.

JAVA

```
package Week_3;

import java.util.Scanner;

public class Ques5 {
    public static void main(String[] args) {
        int temp1, temp2, num1, num2, temp, hcf, lcm;
        Scanner scanner = new Scanner(System.in);

        System.out.print("Enter First Number: ");
        num1 = scanner.nextInt();
        System.out.print("Enter Second Number: ");
        num2 = scanner.nextInt();
        scanner.close();

        temp1 = num1;
        temp2 = num2;

        while(temp2 != 0){
            temp = temp2;
            temp2 = temp1%temp2;
            temp1 = temp;
        }

        hcf = temp1;
        lcm = (num1*num2)/hcf;

        System.out.println("HCF of input numbers: "+hcf);
        System.out.println("LCM of input numbers: "+lcm);
    }
}
```

## WEEK 4

1. Simple Array Operations: Write a program to perform basic operations like finding the sum, average, maximum, and minimum of elements in an array.

JAVA

```
package Week_4;

import java.util.Scanner;

public class Ques1 {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        int n;
        System.out.print("Enter size of Array : ");
        n = scanner.nextInt();
        int[] a = new int[n];
        System.out.println("Enter the Elements of Array : ");
        for(int i = 0; i < n; i++){
            a[i] = scanner.nextInt();
        }
        scanner.close();
        int sum = 0;
        for(int i = 0; i < a.length; i++){
            sum = sum + a[i];
        }
        System.out.println("Sum of Array = "+sum);
        int avg;
        avg = sum / (a.length - 1);
        System.out.println("Average of Array = "+avg);
        int max, min;
        max = a[0];
        min = a[0];
        for(int i = 0; i < a.length; i++){
            if(a[i] > max){
                max = a[i];
            }
            if(a[i] < min){
                min = a[i];
            }
        }
        System.out.println("Maximum Value = "+max);
        System.out.println("Minimum Value = "+min);
    }
}
```

2. Matrix Addition: Write a program to add two matrices.

JAVA

```
package Week_4;

import java.util.Scanner;
```

```

public class Ques2 {
    public static void main(String[] args) {
        int row, col;
        Scanner scanner = new Scanner(System.in);
        System.out.print("Enter number of rows of matrix: ");
        row = scanner.nextInt();
        System.out.print("Enter number of column of column: ");
        col = scanner.nextInt();
        int[][] matrix1 = new int[row][col];
        System.out.print("Enter the elements of first Matrix : ");
        for(int i = 0; i < row; i++){
            for(int j = 0; j < col; j++){
                matrix1[i][j] = scanner.nextInt();
            }
        }
        int[][] matrix2 = new int[row][col];
        System.out.print("Enter the elements of second Matrix : ");
        for(int i = 0; i < row; i++){
            for(int j = 0; j < col; j++){
                matrix2[i][j] = scanner.nextInt();
            }
        }
        System.out.println("Elements of first matrix : ");
        for(int i = 0; i < row; i++){
            for(int j = 0; j < col; j++){
                System.out.print(" "+matrix1[i][j]);
            }
            System.out.println();
        }
        System.out.println("Elements of Second matrix : ");
        for(int i = 0; i < row; i++){
            for(int j = 0; j < col; j++){
                System.out.print(" "+matrix2[i][j]);
            }
            System.out.println();
        }
        int[][] sum = new int[row][col];
        System.out.println("Sum of Matrix : ");
        for(int i = 0; i < row; i++){
            for(int j = 0; j < col; j++){
                sum[i][j] = matrix1[i][j] + matrix2[i][j];
            }
        }
        for(int i = 0; i < row; i++){
            for(int j = 0; j < col; j++){
                System.out.print(" "+sum[i][j]);
            }
            System.out.println();
        }
        scanner.close();
    }
}

```

3. Matrix Multiplication: Write a program to multiply two matrices.

JAVA

```

package Week_4;
import java.util.Scanner;

public class Ques3 {

```

```

@SuppressWarnings("resource")
public static void main(String[] args) {
    Scanner scanner = new Scanner(System.in);
    System.out.println("Enter the number of rows of the first matrix:");
    int rows1 = scanner.nextInt();
    System.out.println("Enter the number of columns of the first matrix:");
    int cols1 = scanner.nextInt();
    System.out.println("Enter the number of rows of the second matrix:");
    int rows2 = scanner.nextInt();
    System.out.println("Enter the number of columns of the second matrix:");
    int cols2 = scanner.nextInt();
    if (cols1 != rows2) {
        System.out.println("Matrix multiplication is not possible with these dimensions.");
        return;
    }
    int[][] matrix1 = new int[rows1][cols1];
    int[][] matrix2 = new int[rows2][cols2];
    int[][] resultMatrix = new int[rows1][cols2];
    System.out.println("Enter the elements of the first matrix:");
    for (int i = 0; i < rows1; i++) {
        for (int j = 0; j < cols1; j++) {
            matrix1[i][j] = scanner.nextInt();
        }
    }
    System.out.println("Enter the elements of the second matrix:");
    for (int i = 0; i < rows2; i++) {
        for (int j = 0; j < cols2; j++) {
            matrix2[i][j] = scanner.nextInt();
        }
    }
    for (int i = 0; i < rows1; i++) {
        for (int j = 0; j < cols2; j++) {
            resultMatrix[i][j] = 0;
            for (int k = 0; k < cols1; k++) {
                resultMatrix[i][j] += matrix1[i][k] * matrix2[k][j];
            }
        }
    }
    System.out.println("The product of the two matrices is:");
    for (int i = 0; i < rows1; i++) {
        for (int j = 0; j < cols2; j++) {
            System.out.print(resultMatrix[i][j] + " ");
        }
        System.out.println();
    }

    scanner.close();
}
}

```

4. Find Largest Element in an Array: Write a program to find the largest element in an array.

JAVA

```

package Week_4;

import java.util.Scanner;

```

```
public class Ques4 {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        int length;
        System.out.println("Enter the length of Matrix : ");
        length = scanner.nextInt();
        int[] array = new int[length];
        System.out.println("Enter the elements of Array : ");
        for(int i = 0; i < length; i++){
            array[i] = scanner.nextInt();
        }
        int max = array[0];
        for(int i = 0; i < array.length; i++){
            if(array[i] > max){
                max = array[i];
            }
        }
        System.out.println("Max elemnts = "+max);
        scanner.close();
    }
}
```

5. Sort an Array: Write a program to sort an array using the bubble sort algorithm.

JAVA

```
package Week_4;

import java.util.Scanner;

public class Ques5 {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.println("Enter the number of elements in the array:");
        int n = scanner.nextInt();
        int[] array = new int[n];
        System.out.println("Enter the elements of the array:");
        for (int i = 0; i < n; i++) {
            array[i] = scanner.nextInt();
        }
        bubbleSort(array);
        System.out.println("Sorted array:");
        for (int num : array) {
            System.out.print(num + " ");
        }
        scanner.close();
    }
    public static void bubbleSort(int[] array) {
        int n = array.length;
        boolean swapped;
        for (int i = 0; i < n - 1; i++) {
            swapped = false;
            for (int j = 0; j < n - 1 - i; j++) {
                if (array[j] > array[j + 1]) {
                    // Swap array[j] and array[j + 1]
                    int temp = array[j];
                    array[j] = array[j + 1];
                    array[j + 1] = temp;
                    swapped = true;
                }
            }
        }
    }
}
```

```
        }  
        if (!swapped) {  
            break;  
        }  
    }  
}
```

## WEEK 5

1. Merge Two Sorted Arrays: Write a program to merge two sorted arrays into one sorted array.

JAVA