Day 2 : Special Logic Building Assignment: 10 special Recursion Programs

1. Print 1 to n without using loops

import java.util.\*;

class HelloWorld {

public static void display(int n){

if(n==1){

n=1;

System.out.print(n+" ");

}else{

display(n-1);

System.out.print(n+" ");}

}

public static void main(String[] args) {

Scanner sc = new Scanner(System.in);

System.out.print("Enter you number = ");

int num = sc.nextInt();

display(num);

}

}

2. Sum of natural numbers using recursion

import java.util.\*;

class HelloWorld {

public static int display(int n){

if(n==1){

return n=1;

//System.out.print(n+" ");

}else{

return n + display(n-1);

}

}

public static void main(String[] args) {

Scanner sc = new Scanner(System.in);

System.out.print("Enter you number = ");

int num = sc.nextInt();

int x = display(num);

System.out.print("sum = "+x);

}

}

3. Mean of Array using Recursion

import java.util.\*;

class HelloWorld {

static float display(int [] arr, int num)

{

if (num == 1)

return (float) arr[num-1];

else

return ((float)(display(arr, num-1)\*(num-1) + arr[num-1]) / num);

}

public static void main(String[] args) {

Scanner sc = new Scanner(System.in);

//System.out.print("Enter you number = ");

//int num = sc.nextInt();

int arr[] = {1, 2, 3};

float x = display(arr,3);

System.out.print("Mean = "+x);

}

}

3. Sum of array elements using recursion

import java.util.\*;

class HelloWorld {

public static int display(int []arr, int num){

if(num == 0){

return num;

//System.out.print(n+" ");

}else{

return display(arr, num-1)+arr[num-1];

}

}

public static void main(String[] args) {

Scanner sc = new Scanner(System.in);

// System.out.print("Enter you number = ");

// int num = sc.nextInt();

int arr[] = {2, 4, 3, 4, 5};

int x = display(arr,5);

System.out.print("sum = "+x);

}

}

4. Decimal to binary number using recursion

import java.util.\*;

class HelloWorld {

public static int getDigit(int n)

{

if (n == 0)

return 0;

return (n % 10 + 2 \* getDigit(n / 10));

}

public static int getBinary(int n)

{

if (n == 0)

return 0;

return (n % 2 + 10 \* getBinary(n / 2));

}

public static void main(String[] args) {

Scanner sc = new Scanner(System.in);

System.out.print("Enter you number binary number = ");

int num = sc.nextInt();

int x=getBinary(num);

System.out.println("Bianry = "+x);

int y=getDigit(num);

System.out.print("Decemal = "+y);

}

}

5. Sum of digit of a number using recursion

import java.util.\*;

class HelloWorld {

public static int getSum(int n)

{

if (n == 0)

return 0;

return (n % 10 + getBinary(n / 10));

}

public static void main(String[] args) {

Scanner sc = new Scanner(System.in);

System.out.print("Enter you number binary number = ");

int num = sc.nextInt();

int x=getSum(num);

System.out.print("Digit Sum = "+x);

}

}

6. Print reverse of a string using recursion

import java.util.\*;

class HelloWorld {

public static void getRev(String str, int num, String res)

{

if (str.length()==0){

System.out.print("Digit Sum = "+ res);

}

else{

String st = res+str.charAt(num-1);

str = str.substring(0, num-1);

getRev(str,num-1,st);

}

}

public static void main(String[] args) {

Scanner sc = new Scanner(System.in);

System.out.print("Enter you number binary number = ");

String str = sc.nextLine();

getRev(str,str.length(),"");

}

}

7. Program for length of a string using recursion

import java.util.\*;

class HelloWorld {

public static int getLen(String str)

{

if (str.equals(""))

return 0;

else

return getLen(str.substring(1))+1;

}

public static void main(String[] args) {

Scanner sc = new Scanner(System.in);

System.out.print("Enter you number binary number = ");

String str = sc.nextLine();

int x = getLen(str);

System.out.print("String Length = "+x);

}

}

8. Tail recursion to calculate sum of array elements.

class Abdul {

public static int arraysSum(int[] arr, int len) {

int sum=0;

if (len == 0) {

return sum;

} else {

return sum= sum +arr[len-1]+ arraysSum(arr, len - 1);

}

}

public static void main(String[] args) {

int[] array = {1,2,3,4,5}; // Replace with your array

int sum = arraysSum(array, 5);

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

}

}

9. Recursive function to check if a string is palindrome

import java.util.\*;

class Abdul {

public static void getRev(String str, int num, String res,String s)

{

if (num==0){

if(res.equals(s))

System.out.print("Your String is Palindrome = "+ s);

else

System.out.print("Your String is not Palindrome = "+ s);

}

else{

String st = res + str.charAt(num-1);

str = str.substring(0, num-1);

getRev(s,num-1,st,s);

}

}

public static void main(String[] args) {

Scanner sc = new Scanner(System.in);

System.out.print("Enter you number binary number = ");

String str = sc.nextLine();

getRev(str,str.length(),"",str);

}

}

10. Print Fibonacci Series in reverse order using Recursion

import java.util.\*;

class Abdul {

public static int revFibo( int num)

{

if(num==1){

return 1;

}

else if(num==0){

return 0;

}

else{

return revFibo(num-1)+revFibo(num-2);

}

}

public static void main(String[] args) {

Scanner sc = new Scanner(System.in);

System.out.print("Enter Number of terms = ");

int n = sc.nextInt();

for(int i=n-1; i>=0; i--)

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

}

}