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| Roll Number | 21SW036 |
| Section # | 03 |
| Lab # | 10 |

**Task#01**

Question statement

1. Write a program to find the factorial of a number using recursion. Take input from user.

# Q1.Java

**Code:**

import java.util.Scanner;  
  
public class Q1 {  
  
 public static int factorial(int n){  
 if(n==1 || n==0)  
 return 1;  
 else  
 return n \* *factorial*(n-1);  
 } // end of factorial  
  
  
 public static void main(String[] args) {  
  
 Scanner sc = new Scanner(System.*in*);  
 System.*out*.print("Enter a number: ");  
 int num = sc.nextInt();  
 System.*out*.println("Factorial of "+num+" is "+*factorial*(num));  
 }  
}

**Output:**

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**Task#02**

Question statement

Write a program to use recursion as a loop to print numbers 1 to n. Take n as input from user.

# Q2.Java

**Code:**

import java.util.Scanner;  
  
public class Q2 {  
  
 public static void printNums(int lowerlimit, int n){  
 if(lowerlimit>n)  
 return;  
 else {  
 System.*out*.println(lowerlimit);  
 *printNums*(lowerlimit + 1, n);  
 }  
 } // end of method  
  
 public static void main(String[] args) {  
  
 Scanner sc = new Scanner(System.*in*);  
 System.*out*.print("Enter a number: ");  
 int num = sc.nextInt();  
 *printNums*(1, num);  
  
 }  
}

**Output:**

**Graphical user interface, text

Description automatically generated**

**Task#03**

Question statement

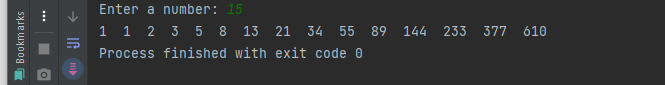
3. Write a java program that generate Fibonacci series

# Q3.Java

**Code:**

import java.util.Scanner;  
  
public class Q3 {  
  
 public static int fab(int n){  
  
  
 if ( n == 0 )  
 return 0;  
 else if ( n == 1 )  
 return 1;  
 else  
 return ( *fab*(n-1) + *fab*(n-2) );  
 } // end of method fab()  
  
  
 public static void main(String[] args) {  
  
 Scanner sc = new Scanner(System.*in*);  
 System.*out*.print("Enter a number: ");  
 int num = sc.nextInt();  
 for (int i=1; i<=num; i++){  
 System.*out*.print(*fab*(i)+" ");  
 }  
 }  
}

**Output:**

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**Task#04**

Question statement

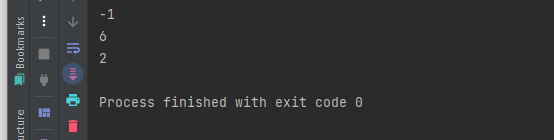
Write a java program that implements binary search using recursive technique

# Q4.Java

**Code:**

public class Q4 {  
  
 public static int binarySearch(int [] arr, int p, int q, int target){  
 if (q>=1) {  
 int mid = (p + q) / 2;  
 if (arr[mid] == target) {  
 return mid;  
 }  
  
 if (arr[mid] > target) {  
 return *binarySearch*(arr, p, q - 1, target);  
 } else {  
 return *binarySearch*(arr, p + 1, q, target);  
 }  
 }  
 // if element not found  
 return -1;  
 }  
  
 public static void main(String[] args) {  
  
 int [] array = {1, 4, 5, 6, -8, 9, 45, 65, 2, 0};  
 System.*out*.println(*binarySearch*(array, 0, (array.length/2)-1, -7));  
 System.*out*.println(*binarySearch*(array, 0, (array.length/2)-1, 45));  
 System.*out*.println(*binarySearch*(array, 0, (array.length/2)-1, 5));  
 }  
}

**Output:**

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