Week 1 - Level 1 - Control flow statements practice problems - 15

Q1) Write a program to check if a number is divisible by 5

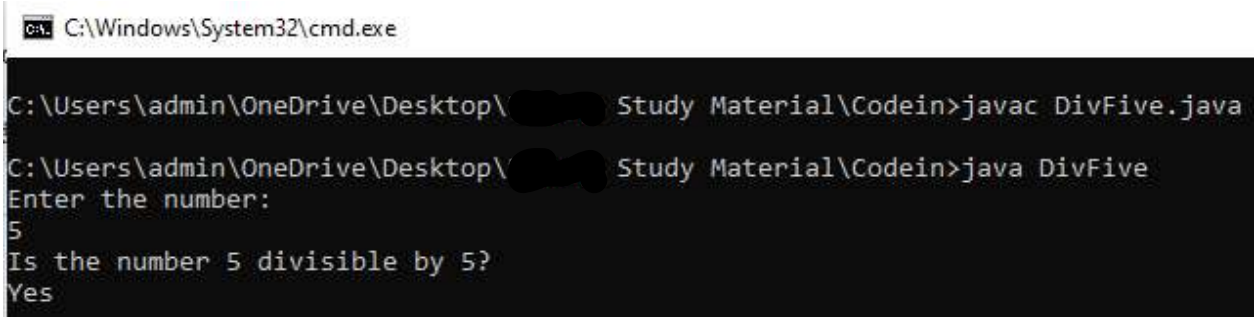
I/P => number

O/P => Is the number ___ divisible by 5? ___

Ans) Code:

```
//import java utility scanner
import java.util.Scanner;
//declare class
public class DivFive {
   public static void main(String args[]) {
      int n; //declare required variables
      Scanner myobj = new Scanner(System.in); //declare scanner class
      System.out.println("Enter the number:"); //prompt user for input
      n = myobj.nextInt(); //store input in variable
      //Apply conditional statements and print required entities
                  if (n % 5 == 0) {
         System.out.println("Is the number "+n" divisible by 5?\nYes");
      } else {
         System.out.println("Is the number "+n" divisible by 5?\nNo");
      }
   }
}
```

Output Verification:



Q2) Write a program to check if the first is the smallest of the 3 numbers.

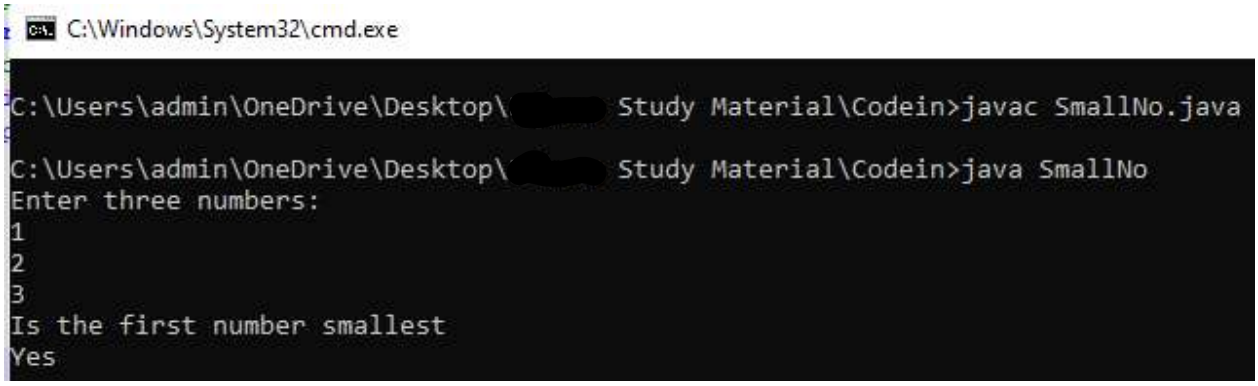
I/P => number1, number2, number3

O/P => Is the first number the smallest? ____

Ans) <u>Code:</u>

```
//import java utility sccanner
import java.util.Scanner;
//declaring class
public class SmallNo{
	public static void main(String[] args){
		int n1,n2,n3;//decclaring variables
		Scanner myobj=new Scanner(System.in);//declaring scanner class
		System.out.println("Enter three numbers: ");//prompting user for input
		n1=myobj.nextInt();//assign value to variables
		n2=myobj.nextInt();//assign value to variables
		n3=myobj.nextInt();//assign value to variables
		//apply conditional statements to get required output
		if (n1<n2&&n2<n3){
			System.out.println("Is the first number smallest\nYes");
			}else{
			System.out.println("Is the first number smallest\nNo" );}
		}
	}
```

Output Verification:



Q3) Write a program to check if the first, second, or third number is the largest of the three.

I/P => number1, number2, number3

O/P =>

Is the first number the largest? _____

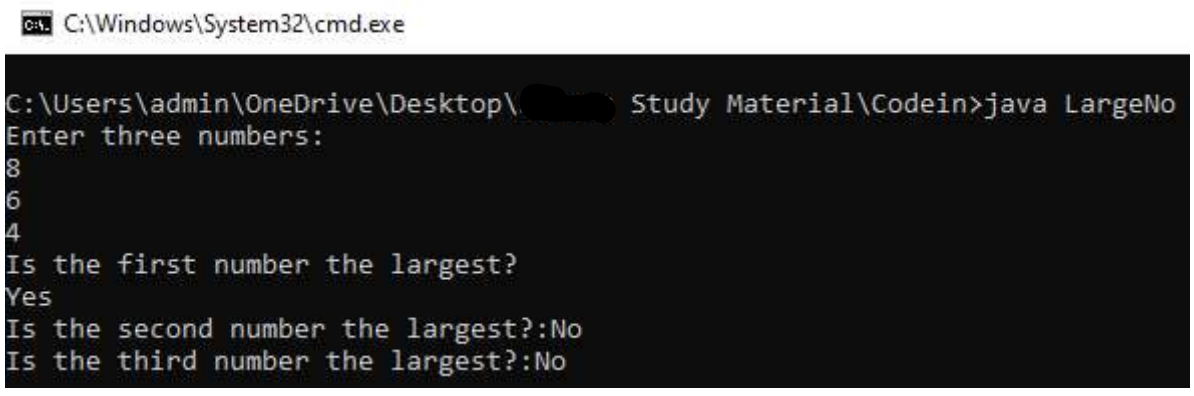
Is the second number the largest? ___

Is the third number the largest? ___

Ans) <u>Code:</u>

```
//import java utility sccanner
import java.util.Scanner;
//declare class
public class LargeNo{
    public static void main(String[] args){
            int n1,n2,n3;//declare variables
            Scanner myobj=new Scanner(System.in);//declare scanner class object
            System.out.println("Enter three numbers: ");//prompt user for input
            n1=myobj.nextInt();//assign values to variables
            n2=myobj.nextInt();//assign values to variables
            n3=myobj.nextInt();//assign values to variables
            //print required outputs using conditional statements
            if (n1>n2&&n1>n3){
                    System.out.println("Is the first number the largest?\nYes\nIs the second
number the largest?:No\nIs the third number the largest?:No");
                    }else if (n2>n1&&n2>n3){
                    System.out.println("Is the first number the largest?:No\nIs the second
number the largest?\nYes\nIs the third number the largest?:No" );
                    }
                    else if(n3>n1&&n3>n2){
                    System.out.println("Is the first number the largest?No\nIs the second
number the largest?:No\nIs the third number the largest?\nYes");
                    }
            }
    }
```

Output Verification:



Q4) Write a program to check for the natural number and write the sum of n natural numbers

Hint =>

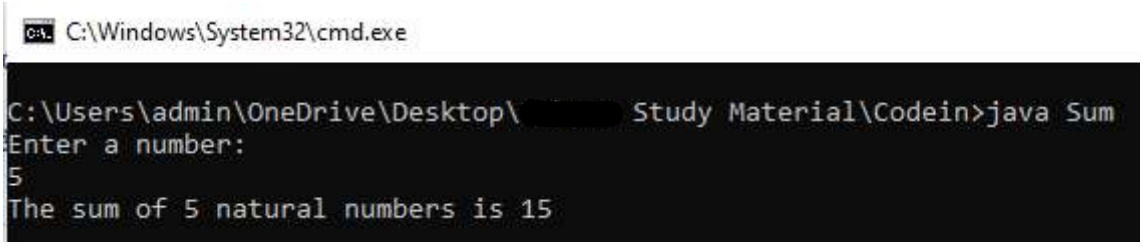
a. A Natural Number is a positive integer (1,2,3, etc) sometimes with the inclusion of 0
b. A sum of n natural numbers is n * (n+1) / 2

I/P => number
O/P => If the number is a positive integer then the output is
The sum of ___ natural numbers is ___
Otherwise
The number ___ is not a natural number

Ans) Code:

```
import java.util.Scanner; // Import Scanner for user input
class Sum { // creating class
   public static void main(String[] args) {
      Scanner input = new Scanner(System.in); // Create Scanner object
       System.out.println("Enter a number:");  // Taking input from the user
      int n = input.nextInt();
      // Check if the number is a natural number (0 or positive integer)
      if (n >= 0) {
         // Calculate the sum of first 'number' natural numbers
         int sum = n * (n + 1) / 2;
         System.out.println("The sum of " + n + " natural numbers is " + sum);
      } else {
         // If number is negative, it's not a natural number
         System.out.println("The number " + n + " is not a natural number.");  }
        }
}
```

Output Verification:



Q5) Write a program to check whether a person can vote, depending on whether his/her age is greater than or equal to 18.

Hint =>

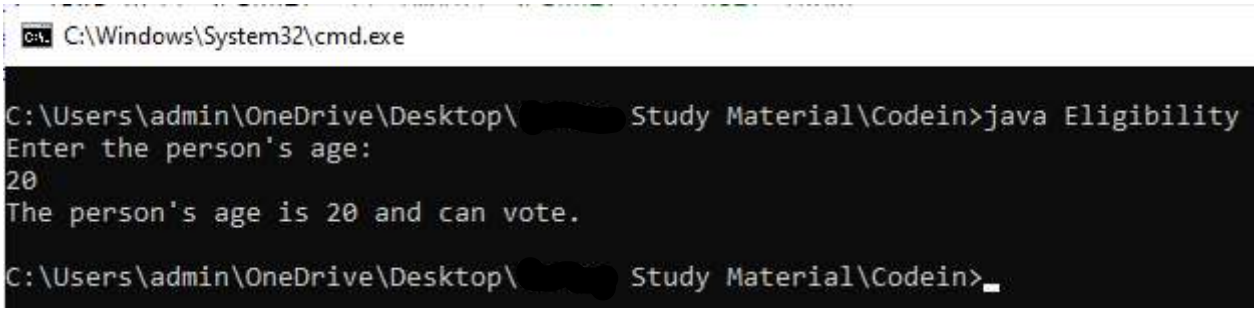
a. Get integer input from the user and store it in the age variable.
b. If the person is 18 or older, print "The person can vote." Otherwise, print "The person cannot vote."

I/P => age
O/P => If the person's age is greater or equal to 18 then the output is
The person's age is ___ and can vote.
Otherwise
The person's age is ___ and cannot vote.

Ans) Code:

```
import java.util.Scanner; // Import Scanner for user input
class Eligibility { // creating class
   public static void main(String[] args) {
      Scanner input = new Scanner(System.in); // Create Scanner object
      // Taking age input from the user
      System.out.println("Enter the person's age:");
      int age = input.nextInt();
      if (age >= 18) {   // Check if the person is eligible to vote
         System.out.println("The person's age is " + age + " and can vote.");
      } else {
         System.out.println("The person's age is " + age + " and cannot vote.");     }
      input.close(); // Close Scanner
   }
}
```

Output Verification:



Q6) Write a program to check whether a number is positive, negative, or zero.

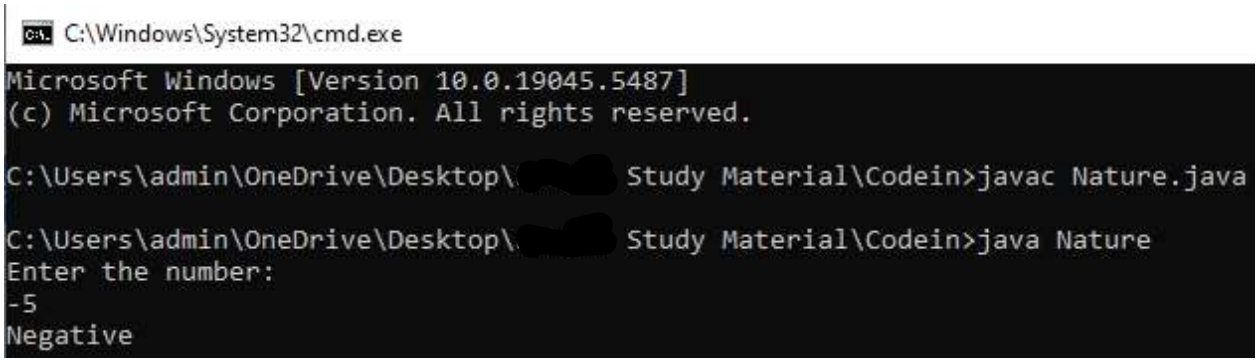
Hint =>

a. Get integer input from the user and store it in the number variable.
b. If the number is positive, print positive.
c. If the number is negative, print negative.
d. If the number is zero, print zero.

Ans) Code:

```
import java.util.Scanner; // Import Scanner for user input
class Nature { // creating class
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in); // Create Scanner object
        // Taking age input from the user
        System.out.println("Enter the number:");
        int n = input.nextInt();
        // Check if the person is eligible to vote
        if (n == 0) {
            System.out.println("Zero"); }
                    else if (n>0) {
            System.out.println("Positive");
        }
        else
        System.out.println("Negative");
    }
}
```

Output Verification:



Q7) Write a program SpringSeason that takes two int values month and day from the command line and prints “Its a Spring Season” otherwise prints “Not a Spring Season”.

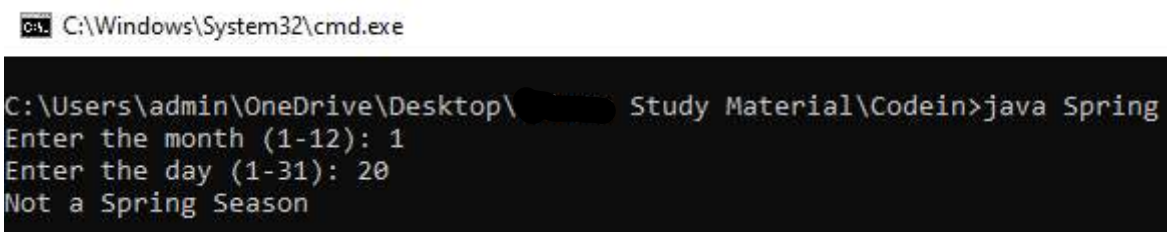
Hint =>

a. Spring Season is from March 20 to June 20

Ans) Code:

```
import java.util.Scanner; //import scanner for input
public class Spring { // creating class
   public static void main(String[] args) {
      // Read the month and day from the user
      Scanner input = new Scanner(System.in);
      System.out.print("Enter the month (1-12): ");
      int month = input.nextInt();
      System.out.print("Enter the day (1-31): ");
      int day = input.nextInt();
      // Check if the date falls within the Spring season
      if ((month == 3 && day >= 20 && day<=30) || (month == 4 && day <=30) || (month == 5 &&
day <=31) || (month == 6 && day <= 20)) {
                  System.out.println("It's a Spring Season");}
                  else if (month>12 || day >31){
                        System.out.println("Invalid input");
      } else {
         System.out.println("Not a Spring Season");
      }
   }
}
```

Output Verification:



Q8) Write a program to count down the number from the user input value to 1 using a ***while*** loop for a rocket launch

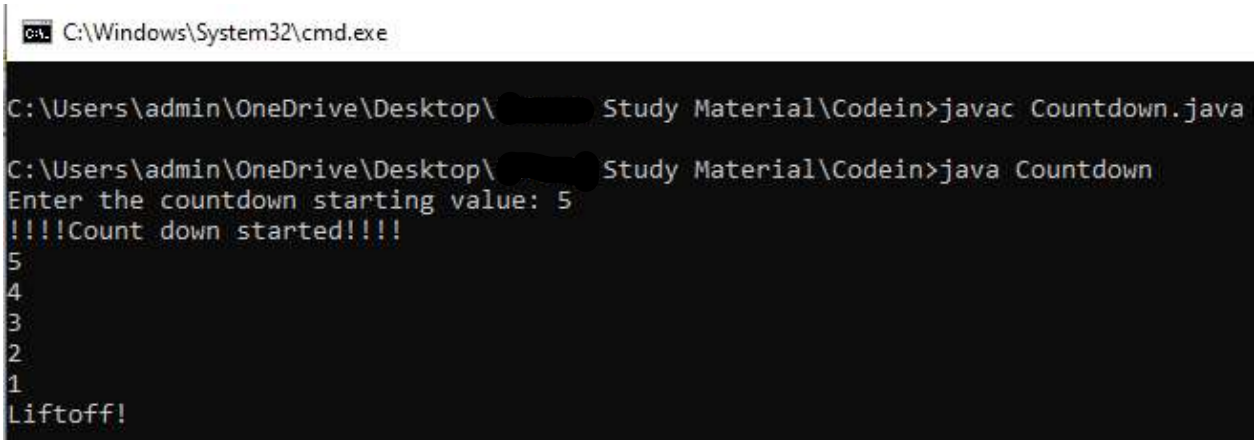
Hint =>

a. Create a variable counter to take user inputted value for the countdown.
b. Use the ***while*** loop to check if the counter is 1
c. Inside a ***while*** loop, print the value of the counter and decrement the counter.

Ans) Code:

```
import java.util.Scanner; //import scanner for input
public class Countdown { //creating class
   public static void main(String[] args) {
      // Create a scanner to read the user's input
      Scanner input = new Scanner(System.in);
      System.out.print("Enter the countdown starting value: ");
      int counter = input.nextInt();  // Take the countdown start value as input
      System.out.println("!!!!Count down started!!!!");
      // Countdown using a while loop
      while (counter >= 1) {
         System.out.println(counter);  // Print the current value of the counter
         counter--;  // Decrement the counter
      }
      System.out.println("Liftoff!");
   }
}
```

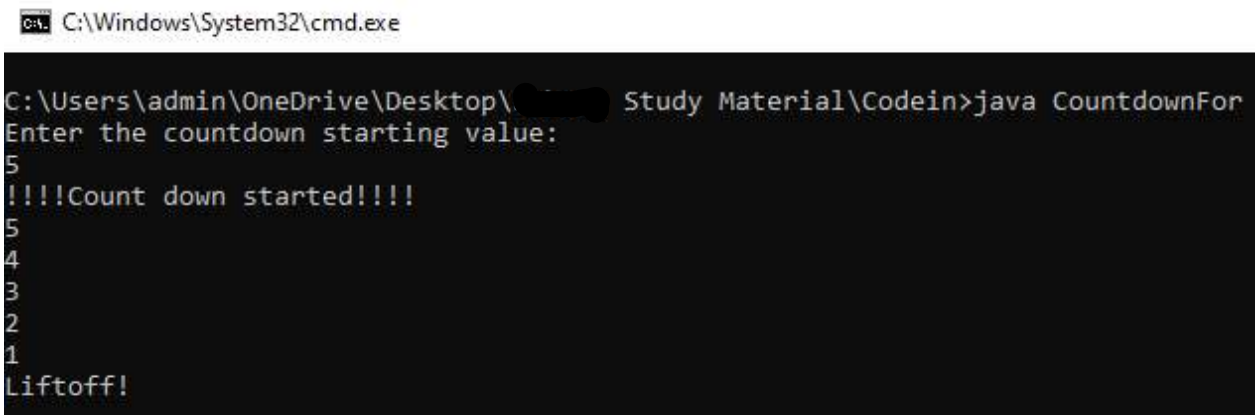
Output Verification:



Q9) Rewrite program 8 to do the countdown using the ***for***-loop
Ans) Code:

```
import java.util.Scanner; //import scanner for input
        public class CountdownFor{ // creating class
                public static void main(String arr[]){
                int num1; //declaring variables
                Scanner input=new Scanner(System.in); // Create a scanner to read the user's
input
                System.out.println("Enter the countdown starting value:");
                num1=input.nextInt();
                System.out.println("!!!!Count down started!!!!");
                        for(;num1!=0;){
                                System.out.println(+num1);
                                num1--;
                        }
                 System.out.println("Liftoff!");
                }
        }
```

Code Verification:



Q10) Write a program to find the sum of numbers until the user enters 0

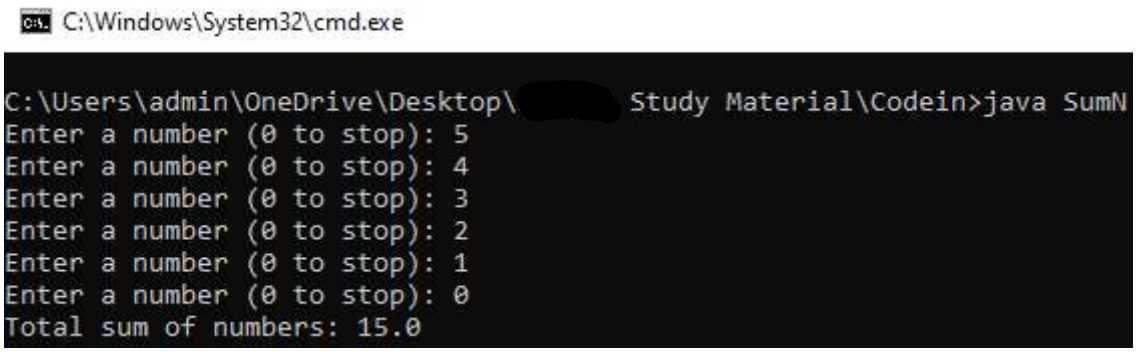
Hint =>

a. Create a variable total of type double initialize to 0.0. Also, create a variable to store the double value the user enters
b. Use the ***while*** loop to check if the user entered is 0
c. If the user entered value is not 0 then inside the while block add user entered value to the total and ask the user to input again
d. The loop will continue till the user enters zero and outside the loop display the total value

Ans) Code:

```
import java.util.Scanner; // Import scanner for input

public class SumN { // Creating class

    public static void main(String[] args) {

        // Create a scanner to read user input

        Scanner scanner = new Scanner(System.in);

        // Initialize the total sum to 0.0

        double total = 0.0;

        double number =1;

        // While loop to keep adding numbers until the user enters 0

        while (number != 0) { // Keep asking until the user enters 0

            System.out.print("Enter a number (0 to stop): ");

            number = scanner.nextDouble();

            // If the number is not 0, add it to the total

            if (number != 0) {

                total += number;

            }

        }

        // Display the total sum

        System.out.println("Total sum of numbers: " + total);

    }

}
```

Output Verification:



Q11) Rewrite the program 10 to find the sum until the user enters 0 or a negative number using ***while*** loop and break statement

Hint =>

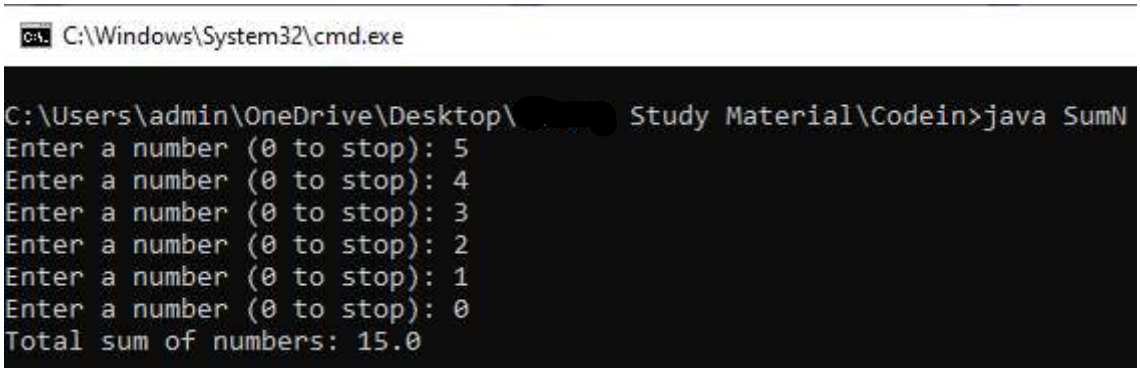
a. Use infinite while loop as in `while (true)`
b. Take the user entry and check if the user entered 0 or a negative number to break the loop using `break;`

Ans) Code:

```
import java.util.Scanner; // Import scanner for input

public class SumN { // Creating class

    public static void main(String[] args) {

        // Create a scanner to read user input

        Scanner scanner = new Scanner(System.in);

        // Initialize the total sum to 0.0

        double total = 0.0;

        double number =1;

        // While loop to keep adding numbers until the user enters 0

        while (number != 0) { // Keep asking until the user enters 0

            System.out.print("Enter a number (0 to stop): ");

            number = scanner.nextDouble();

            // If the number is not 0, add it to the total

            if (number != 0) {
```

```
            total += number;
        }
    }
    // Display the total sum
    System.out.println("Total sum of numbers: " + total);
  }
}
```

Output Verification:



Q12) Write a program to find the sum of n natural numbers using ***while*** loop compare the result with the formulae n*(n+1)/2 and show the result from both computations was correct.

Hint =>

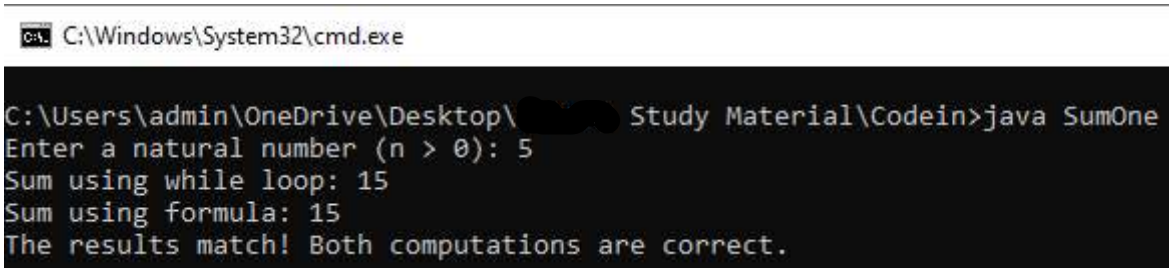
a. Take the user input number and check whether it's a Natural number
b. If it's a natural number Compute using formulae as well as compute using ***while*** loop
c. Compare the two results and print the result

Ans) Code:

```
import java.util.Scanner;//import scanner for input

//declare class

public class SumOne {

 public static void main(String[] args) {

 Scanner scanner = new Scanner(System.in);

 // Take user input

 System.out.print("Enter a natural number (n > 0): ");

 int n = scanner.nextInt();// Check if the input is a natural number

 if (n <= 0) {

 System.out.println("Invalid input! Please enter a natural number greater than 0.");

 } else { // sum using while loop

 int sumWhileLoop = 0, i = 1;

 while (i <= n) {

 sumWhileLoop += i;

 i++;

 }

 // sum using formula

 int sumFormula = n * (n + 1) / 2;

// Print both results

 System.out.println("Sum using while loop: " + sumWhileLoop);

 System.out.println("Sum using formula: " + sumFormula);

 // Compare results
```

```
        if (sumWhileLoop == sumFormula) {
            System.out.println("The results match! Both computations are correct.");
        } else {
            System.out.println("There is a mismatch. Check your calculations.");
        }
    }
  }
}
```

Output Verification:



Q13) Rewrite the program number 12 with the ***for*** loop instead of a while loop to find the sum of n Natural Numbers.

Hint =>

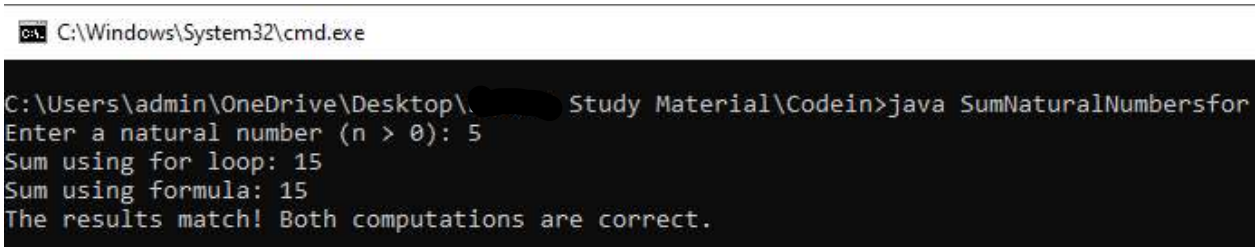
a. Take the user input number and check whether it's a Natural number
b. If it's a natural number Compute using formulae as well as compute using ***for*** loop
c. Compare the two results and print the result

Ans) Code:

```
import java.util.Scanner;

public class SumNaturalNumbersfor {

 public static void main(String[] args) {

 Scanner scanner = new Scanner(System.in);

 // Take user input

 System.out.print("Enter a natural number (n > 0): ");

 int n = scanner.nextInt();// Check if the input is a natural number

 if (n <= 0) {
```

```
System.out.println("Invalid input! Please enter a natural number greater than 0.");
} else { // sum using for loop
int sumforLoop = 0, i = 1;
for (;i <= n;) {
sumforLoop += i;
i++;
}
// sum using formula
int sumFormula = n * (n + 1) / 2;
// Print both results
System.out.println("Sum using for loop: " + sumforLoop);
System.out.println("Sum using formula: " + sumFormula);
// Compare results
        if (sumforLoop == sumFormula) {
            System.out.println("The results match! Both computations are correct.");
        } else {
            System.out.println("There is a mismatch. Check your calculations.");
        }
    }

  }
}
```

Output Verification:



Q14) Write a Program to find the factorial of an integer entered by the user.

Hint =>

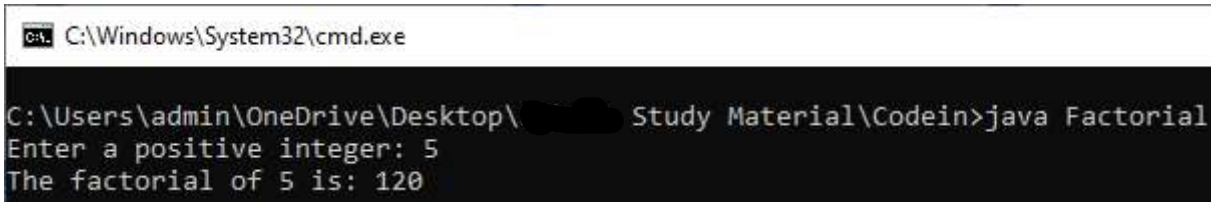
a. For example, the factorial of 4 is 1 * 2 * 3 * 4 which is 24.
b. Take an integer input from the user and assign it to the variable. Check the user has entered a positive integer.
c. Using a ***while*** loop, compute the factorial.
d. Print the factorial at the end.

Ans) Code:

```
import java.util.Scanner; //import scanner

public class Factorial { //creating class

   public static void main(String[] args) {

      Scanner scanner = new Scanner(System.in);

      int n, factorial = 1;

      // Taking user input

      System.out.print("Enter a positive integer: ");

      n = scanner.nextInt();

      // Check if the number is a positive integer

      if (n < 0) {

         System.out.println("Please enter a positive integer.");

         return;

      }

      // Compute factorial using a while loop

      int i = 1;

      while (i <= n) {

         factorial *= i; // Multiply the current value of factorial by i

         i++;

      }

      // Print the result

      System.out.println("The factorial of " + n + " is: " + factorial);
```

```
    }
}
```

Output Verification:



Q15) Rewrite program 14 using for loop

Hint =>

a. Take the integer input, check for natural number and determine the factorial using for loop and finally print the result.

Ans) Code:

```
import java.util.Scanner; // Import Scanner
public class FactorialFor { // Creating class
   public static void main(String[] args) {
      Scanner scanner = new Scanner(System.in);
      int n, factorial = 1;
      // Taking user input
      System.out.print("Enter a positive integer: ");
      n = scanner.nextInt();
      // Check if the number is a positive integer
      if (n < 0) {
         System.out.println("Please enter a positive integer.");
      } else {
         // Compute factorial using for loop
         for (int i = 1; i <= n; i++) {
            factorial *= i; // Multiply the current value of factorial by i
         }
         // Print the result
         System.out.println("The factorial of " + n + " is: " + factorial);
                  }
```

```
        }
}
```

Output Verification: