Question No 1 :

Write a program called SumAverageRunningInt to produce the sum of 1, 2, 3, ..., to 100. Store 1 and 100 in variables lowerbound and upperbound, so that we can change their values easily. Also compute and display the average. The output shall look like:

The sum of 1 to 100 is 5050
The average is 50.5

Answer 1 :

```
import java.util.Scanner;

public class SumGivenRange {
    public static void main(String[] args)
    {
        System.out.println("Enter the range for addition : ");

        Scanner Object10 = new Scanner(System.in);

        long
lowerbound=Object10.nextLong(),upperbound=Object10.nextLong(),sum=0,nu
mb=0,duplicate=lowerbound;

        for (int i = 0; duplicate <= upperbound; i++)
        {
            sum = sum + duplicate;
            duplicate++;
            numb++;
        }
        System.out.println("The sum of "+lowerbound+" to
"+upperbound+" is "+sum);

        float avg=(float)sum/numb;//Manual Java Type Casting
        System.out.println("The average is "+avg);
    }
}
```

Output 1 :

```
Enter the range for addition :
1
100
The sum of 1 to 100 is 5050
The average is 50.5
BUILD SUCCESSFUL (total time: 5 seconds)
```

Question No 2 :

Write a program called **`HarmonicSum`** to compute the sum of a harmonic series, as shown below, where *n*=`50000`. The program shall compute the sum from *left-to-right* as well as from the *right-to-left*. Are the two sums the same? Obtain the absolute difference between these two sums and explain the difference. Which sum is more accurate?

Answer 2 :

```
public class HarmonicSum {
    public static void main (String[] args){
        double n=0;
        for (int i = 1; i <= 5000; i++) {
            n=n+1/i;
        }
        System.out.println("The sum from left-to-right is "+n);

        double m=0;
        for (int i = 5000; i >=1; i--) {
            m=m+1/i;
        }
        System.out.println("The sum from right-to-left is "+m);
        System.out.println("Both method is same ! \n");

        double a=0;
        for (int i = 1; i <= 1000; i++) {
            a=a+1/i;
        }
        System.out.println("When Maximum-denominator is 1000 the value
of pie is "+a);
        double b=0;
        for (int i = 1; i <= 10000; i++) {
            b=b+1/i;
        }
        System.out.println("When Maximum-denominator is 10000 the
value of pie is "+b);

        double c=0;
        for (int i = 1; i <= 100000; i++) {
            c=c+1/i;
        }
        System.out.println("When Maximum-denominator is 100000 the
value of pie is "+c);
        double d=0;
        for (int i = 1; i <= 1000000; i++) {
            d=d+1/i;
        }
        System.out.println("When Maximum-denominator is 1000000 the
value of pie is "+d);

    }
}
```

Output 2 :

```
The sum from left-to-right is 1.0
The sum from right-to-left is 1.0
Both method is same !

When Maximum-denominator is 1000 the value of pie is 1.0
When Maximum-denominator is 10000 the value of pie is 1.0
When Maximum-denominator is 100000 the value of pie is 1.0
When Maximum-denominator is 1000000 the value of pie is 1.0
BUILD SUCCESSFUL (total time: 0 seconds)
```

Question No 3 :

Write a program called **`Fibonacci`** to print the first `20` Fibonacci numbers `F(n)`, where `F(n)=F(n-1)+F(n-2)` and `F(1)=F(2)=1`. Also compute their average. The output shall look like:

```
The first 20 Fibonacci numbers are:

1 1 2 3 5 8 13 21 34 55 89 144 233 377 610 987 1597 2584 4181 6765

The average is 885.5
```

Answer 3 :

```
import java.util.Scanner;

public class Fibonacci {
    public static void main(String[] args){
        Scanner object7 = new Scanner(System.in);

        System.out.println("Enter how many first Fibonacci series
number you want : ");
        int n = object7.nextInt();
        System.out.println("The first "+n+" Fibonacci are : ");
        long a=0,b=1,c=0;//only c instead of c=0 then error c is not
initiaized appear in error1
        for (int i = 1; i <= n-2; i++) {
            c = a+b;
            if(i==1)
            {
                System.out.print(a+"\t"+b+"\t"+c+"\t");
            }
            else
            {
```

```
                System.out.print(c+"\t");//"/t" is a escpae sequence
in java
            }
            a=b;
            b=c;
            }
        float avg = (float)c/n;//since avg is declared of type float,
therefore we are converting the c/n to type float by writing
(float)c/n ( as int/int will give int in Java ).
        System.out.println("\n"+"The average is "+avg+".");
        }
    }
```

Output 3 :

```
Enter how many first Fibonacci series number you want :
20
The first 20 Fibonacci are :
0       1       1       2       3       5       8       13      21      34      55      89
        144     233     377     610     987     1597    2584    4181
The average is 209.05.
BUILD SUCCESSFUL (total time: 5 seconds)
```

Question No 4 :

Write a program called **`ExtractDigits`** to extract each digit from an `int`, in the reverse order. For example, if the `int` is 15423, the output shall be "3 2 4 5 1", with a space separating the digits.

Answer 4 :

```
import java.util.Scanner;

public class ExtractDigits {
    public static void main (String[] args)
    {
        Scanner obj = new Scanner (System.in);

        System.out.println("Enter a numeric integer value : ");
        int org = obj.nextInt();
        int ans;
        double y =0;
        String sum="";
```

```
        while(org>0)//here wew
        {
            ans = org%10;//extract numer
            sum=sum+ans+" "; //remainning
            org = org/10;//quotient
        }
        System.out.println(sum);
    }
}
```

Output 4 :

```
Enter a numeric integer value :
15423
3 2 4 5 1
BUILD SUCCESSFUL (total time: 17 seconds)
```

Question No 5 :

A sales tax of 7% is levied on all goods and services consumed. It is also mandatory that all the price tags should include the sales tax. For example, if an item has a price tag of $107, the actual price is $100 and $7 goes to the sales tax.
Write a program using a loop to continuously input the tax-inclusive price (in double); compute the actual price and the sales tax (in double); and print the results rounded to 2 decimal places. The program shall terminate in response to input of -1; and print the total price, total actual price, and total sales tax

Answer 5 :

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

public class SalesTax {
    public static void main (String[] args)
    {
        Scanner obj = new Scanner(System.in);

        System.out.println("Enter The Total Price tag of the item :
");
        double Tcost = obj.nextDouble();

        double Tax = Tcost*0.06542056074;
        //double Tax = Tcost*7/107;

        double Acost = Tcost - Tax;
```

```
        System.out.println("Actual Cost : "+Acost);
        System.out.println("Sales Tax   : "+Tax);
        System.out.println("Total Price : "+Tcost);

//        This below code also give 2 number after decimal but it is
not correct way
//        System.out.println("Actual Cost :
"+Math.round(Acost*100.0)/100.0);
//        System.out.println("Sales Tax   :
"+Math.round(Tax*100.0)/100.0);
//        System.out.println("Total Price :
"+Math.round(Tcost*100.0)/100.0);
 }
}
```

Output 5 :

```
Enter The Total Price tag of the item :
107
Actual Cost : 100.00000000082
Sales Tax   : 6.999999999179999
Total Price : 107.0
BUILD SUCCESSFUL (total time: 5 seconds)
```

Question No 6 :

A word that reads the same backward as forward is called a *palindrome*, e.g., "mom", "dad", "racecar", "madam", and "Radar" (case-insensitive). Write a program called **`TestPalindromicWord`**, that prompts user for a word and prints "`"xxx" is|is not a palindrome`".

Answer 6 :

```
import java.util.Scanner;

public class Pallindrome {
    public static void main (String[] args)
    {
        System.out.println("Enter a word : ");

        Scanner obj = new Scanner(System.in);
```

```
        String word = obj.nextLine(),reverse="";//strings take both
numeric as well as character
        for (int i =word.length()-1; i>=0; i--)
        {
            reverse = reverse + word.charAt(i);
        }
        if(reverse.equals(word))//for string use var.equals(var)
        {
            System.out.println("The word "+word+" is Pallindrome !");
        }
        else
        {
            System.out.println("The word "+word+" is not Pallindrome
!");
        }

    }
}
```

Output 6 :

```
Enter a word :
rara
The word rara is not Pallindrome !
BUILD SUCCESSFUL (total time: 29 seconds)
```

Thank You !