

2. 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:

```
public class sumToN {  
    public static void main(String[] args){  
        int lb = 1, ub = 100, sum = 0;  
        for(int i = 0; i<=ub; i++){  
            sum += i;  
        }  
        System.out.println("The sum of 1 to 100 is: "+ sum);  
        float average = (lb + ub)/2;  
        System.out.println("The average is " +average);  
    }  
}
```

4. Write a program called **ComputePI** to compute the value of π , using the following series expansion. Use the maximum denominator (maxDenominator) as the terminating condition. Try maxDenominator of 1000, 10000, 100000, 1000000 and compare the PI obtained. Is this series suitable for computing PI? Why?

$$\pi = 4 \times \left(1 - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} + \frac{1}{9} - \frac{1}{11} + \frac{1}{13} - \frac{1}{15} + \dots \right)$$

Answer:

```
import java.util.Scanner;
```

```

public class computePi {

    public static void main(String[] args) {

        double pi = 1, constant = 1, maxDeno = 1;

        while (maxDeno != 0) {

            pi = 1;

            constant = 1;

            Scanner scan = new Scanner(System.in);

            System.out.println("enter the maximum denominator:");

            maxDeno = scan.nextDouble();

            for (double deno = 3; deno <= maxDeno; deno += 2) {

                pi = (pi - constant / deno);

                constant *= -1;

            }

            if(maxDeno!=0){

                System.out.println(4 * pi + " is the value of pi with max deno "
+ maxDeno);

            }

            else{

                System.out.println("Its over!");

            }

        }

    }

}

```

```

        }
    }
}
}

```

6. 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:

```

package reverseNum;
import java.util.*;
public class reverseInt {
    public static void main(String[] args){
        Scanner sc = new Scanner(System.in);
        System.out.println("Enter the number to reverse it :");
        int original, reversed=0;
        original = sc.nextInt();
        while(original!=0){
            int rem = original % 10;
            reversed = reversed * 10 + rem;
            original /=10;
        }
        System.out.println(reversed + " is the reversed number.");
    }
}

```

8. 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:

```
package billing;

import java.util.Scanner;

public class salesInput{

    public double input(){

        Scanner sc = new Scanner(System.in);

        System.out.println("Enter the tagged amount");

        double num = sc.nextDouble();

        return num; }}

package billing;

public class calcuateBill {

    public static void main(String[] args){

        double tmp=0, tap=0, ttax=0, mp = 0, ap, tax = 0;

        salesInput si = new salesInput();

        while (mp != -1){

            mp = si.input();

            if (mp != -1){

                ap = mp/1.07;
```

```
        tax = ap*0.07;

        mp = Math.round(mp*100D)/100D;

        ap = Math.round(ap*100D)/100D;

        tax =Math.round(tax*100D)/100D;

        System.out.println("Marked price=" +mp);

        System.out.println("Actual price=" +ap);

        System.out.println("Tax amount=" +tax);

        tmp += mp;

        tap += ap;

        ttax += tax;

    }

}

    tmp = Math.round(tmp*100D)/100D;

    tap = Math.round(tap*100D)/100D;

    ttax = Math.round(ttax*100D)/100D;

    System.out.println("Total marked price=" +tmp);

    System.out.println("Total actual price" +tap);

    System.out.println("Total tax amount=" +ttax);

}

}
```

10. 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:

```
import java.util.*;

public class checkPalindrome {

    public static void main(String[] args){

        String initial, reversed = "";

        Scanner sc = new Scanner(System.in);

        System.out.println("Enter the word to check if it is palindromic:");

        initial = sc.nextLine();

        int length = initial.length();

        for(int i=length-1; i>=0; i--){

            reversed = reversed + initial.charAt(i);

        }

        if(initial.equals(reversed)){

            System.out.println(initial + " is a palindrome.");

        }

        else{

            System.out.println(initial + " is not a palindrome.");

        }

    }

}
```

}