**While Loop Demo – Loopy1 Name \_\_\_\_\_\_\_\_\_\_\_\_\_ period \_\_\_\_\_\_\_**

Objective To introduce while loops with many examples.

Copy the following program into jGrasp and run.

//Name period   
// lab  
// Honor Code  
 import java.util.Scanner;  
 public class Loopy1 {   
 public static void main (String[] args) {   
 int c, lines;  
 String delay;   
 double sum, avg;   
 char ch;   
 Scanner input=new Scanner(System.in);   
 //\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*  
 System.out.println("\n Count to ten ");  
 c = 1;   
 while (c<=10)   
 {   
 System.out.print(c+" ");   
 c = c+1;   
 }   
 System.out.println("\nContinue? Press any character and enter.");  
 delay=input.next();  
 //\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*  
 System.out.println("\nCount 'a' to 'z'" );  
 ch = 'a';   
 while (ch<='z') {   
 System.out.print (ch);   
 ch++;   
 }   
 System.out.println("\n\nContinue? Press any character and enter.");  
 delay=input.next();  
 //\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*  
 System.out.println("\nCount backwards");   
 c = 100;   
 while(c>=1) {   
 System.out.print (" "+c);   
 c = c-1; //c--;   
 }   
 System.out.println();   
 System.out.println("\nContinue? Press any character and enter.");  
 delay=input.next();  
 //\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*  
 System.out.println("\nThe number of the even numbers from 0 to 40");   
 int sumOfEven = 0;  
 int i = 0;  
 while (i < 40) {  
 if (i%2 == 0) {  
 sumOfEven = sumOfEven + i;  
 }  
 i = i + 1;  
 }  
 System.out.println(sumOfEven);

System.out.println("\nContinue? Press any character and enter.");  
 delay=input.next();  
 //\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*  
 System.out.println("\nSum and average ");  
 sum = 0;   
 avg = 0;   
 c = 1;   
 System.out.println("How many numbers?");  
 int num = input.nextInt();  
 while (c<=num) {   
 System.out.print("enter a number: ");   
 sum = sum + input.nextInt();   
 c++;   
 }   
 System.out.println();   
 avg = sum/num;   
 System.out.println("The average is "+avg+".");   
 }  
 }  
**Use this program as an example to write the new code.**

Write the new program LoopyLab2018 **(the testing code is attached below).**

**Using “while” loops**, write a program that does the following:

1) Write a method named smallestFactor that accepts a positive number and returns the smallest factor of the number other than 1. If the number is prime, the method returns 1.

2) Write a method named zeroDigits that accepts an integer parameter and returns the number  
of digits in the number that have the value 0. For example, the call zeroDigits(5024036) should return 2 and zeroDigits(743) should return 0. The call zeroDigits(0) should return 1.

3) Write a method named partOfPhrase that accepts a String phrase and a character stop as parameters. The method prints the characters in the String till it encounters the character stop. For example, the call partOfPhrase ("We are painting", ‘p’) should print "We are “ and partOfPhrase ("We are talking", ‘p’) should print "We are talking". The call partOfPhrase ("",‘p’) should not print anything.

4) Write a method named divideBy2 that accepts an integer parameter and returns how many times  
the number can be divided by 2 without a remainder. For example, the call divideBy2 (128) should return 7 and divideBy2 (1235) should return 0. The call divideBy2 (244) should return 2.

5) Write a method named averageLowHigh that accepts two integers low and high and returns the average of all the numbers between low and high. If high is less than low, the method returns 0.

public class LoopyLab2018 {  
 public static void main (String[] args) {  
 //#1  
 int num1=457, num11=1, num111=34555;  
 int ans1= smallestFactor(num1);  
 if (ans1==1) System.out.println (num1+" is a prime number");  
 else System.out.println ("the smallest factor of "+num1+" is "+ans1);  
 ans1= smallestFactor(num11);  
 if (ans1==1) System.out.println (num11+" is a prime number");  
 else System.out.println ("the smallest factor of "+num11+" is "+ans1);  
 ans1= smallestFactor(num111);  
 if (ans1==1) System.out.println (num111+" is a prime number");  
 else System.out.println ("the smallest factor of "+num111+" is "+ans1);  
 System.out.println();  
 // #2  
 int num2= 0, num22=743, num222=5024036;   
 System.out.println ("The number of zeros in "+num2 +": "+zeroDigits(num2));  
 System.out.println ("The number of zeros in "+num22 +": "+zeroDigits(num22));  
 System.out.println ("The number of zeros in "+num222 +": "+zeroDigits(num222));  
 System.out.println();  
 //#3  
 String phrase3= "We are painting";  
 String phrase33= "";  
 String phrase333= "We are talking";  
 char stop='p';  
 partOfPhrase(phrase3, stop);  
 System.out.println ("\*\*\*\*\*");  
 partOfPhrase(phrase33, stop);  
 System.out.println ("\*\*\*\*\*");  
 partOfPhrase(phrase333, stop);  
 System.out.println();  
 //#4  
 int number4= 128,number44=1235, number444=244 ;  
 System.out.println (number4+" can be divided by two "+ divideBy2 (number4)+ " times");  
 System.out.println (number44+" can be divided by two "+ divideBy2 (number44)+ " times");  
 System.out.println (number444+" can be divided by two "+ divideBy2 (number444)+ " times");  
 System.out.println();  
 //#5  
 int a1=-3, a2=7, a3=9;  
 System.out.println ("The average between "+a1+" and "+a2+" is "+ averageLowHigh (a1, a2));  
 System.out.println ("The average between "+a2+" and "+a3+" is "+ averageLowHigh (a2, a3));  
 System.out.println ("The average between "+a3+" and "+a1+" is "+ averageLowHigh (a3, a1));  
 }  
   
 //#1  
 public static int smallestFactor (int num){ }  
   
 //#2   
 public static int zeroDigits (int param){ }  
   
 //#3  
 public static void partOfPhrase (String phrase, char stop){ }  
   
 //#4  
 public static int divideBy2 (int number){ }  
   
 //#5  
 public static double averageLowHigh (int low, int high){ }  
   
   
OUTPUT:  
 457 is a prime number  
1 is a prime number  
the smallest factor of 34555 is 5  
  
The number of zeros in 0: 1  
The number of zeros in 743: 0  
The number of zeros in 5024036: 2  
  
We are   
\*\*\*\*\*  
  
\*\*\*\*\*  
We are talking  
  
128 can be divided by two 7 times  
1235 can be divided by two 0 times  
244 can be divided by two 2 times  
  
The average between -3 and 7 is 2.0  
The average between 7 and 9 is 8.0  
The average between 9 and -3 is 0.0  
\*/