ASSIGNMENT NU 3

SNIPPENT QUESTIONS

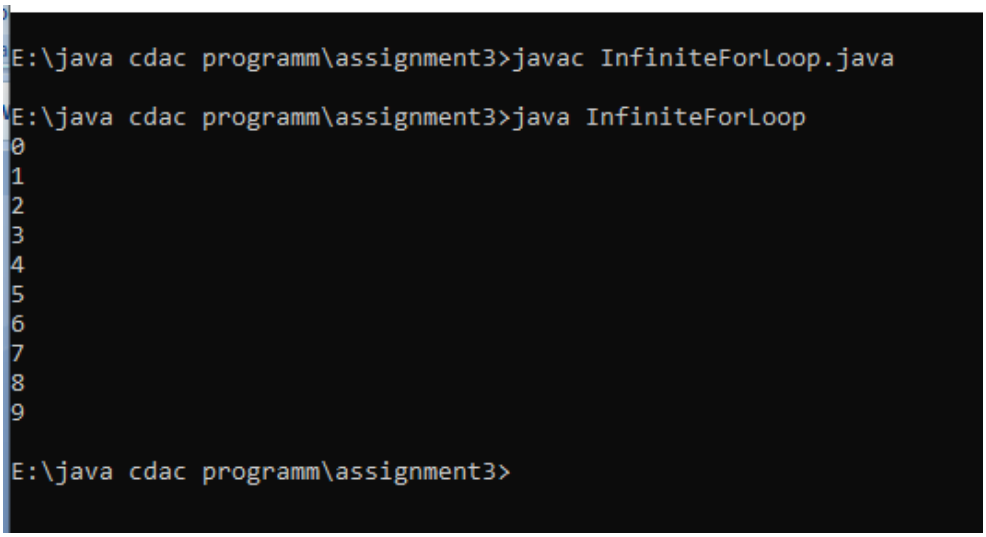
1
```
public class InfiniteForLoop {
   public static void main(String[] args) {
     for (int i = 0;i < 10; i--)
          {
          System.out.println(i);
            }
     }
}
```
Error:

1. Loop is gone in infinite state.

Correct Code:

```
public class InfiniteForLoop {
          public static void main(String[] args) {
            for (int i = 0;i < 10; i++)
                 {
                 System.out.println(i);
                   }
          }
}
```

Output



Q.1.Why does this loop run infinitely?

Ans: because initially I is 0 and conditions is i—so that's why loop go to in infinite loop

2. How should the loop control variable be adjusted?

Ans : Above for loop condition is change i++ then loop is control and we get output.

2.

```
public class IncorrectWhileCondition {
   public static void main(String[] args) {
        int count = 5;
       while (count = 0) {
      System.out.println(count);
     count--;
    }
   }
}
```

Error: we cannot write direct in while loop conditions 0 and 1 both .

1.Why does the loop not execute as expected?

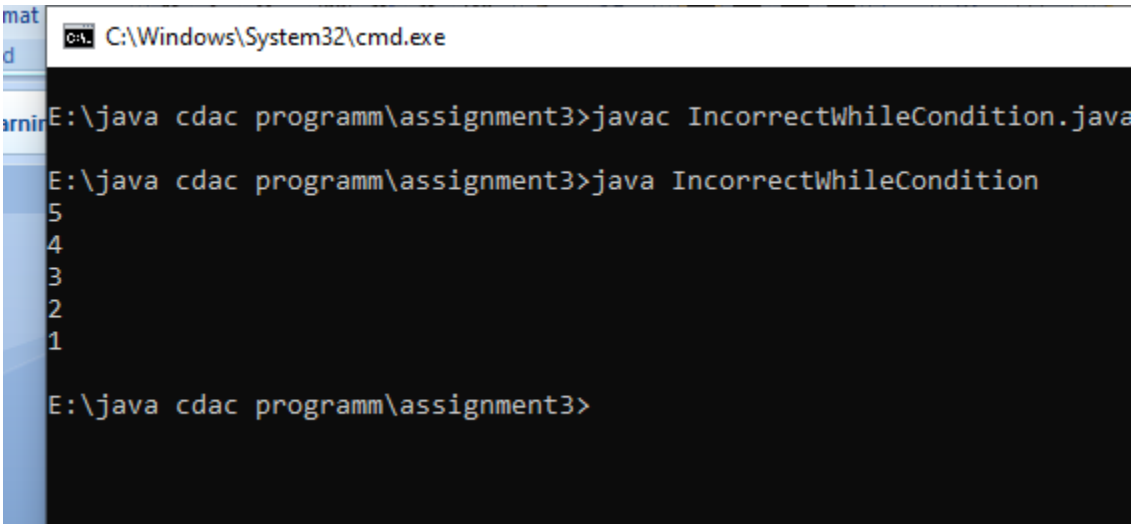
2.What is the issue with the condition in the `while` loop?

Ans : we cannot write direct in while loop conditions 0 and 1 both .

Correct code:

```
public class IncorrectWhileCondition {
  public static void main(String[] args) {
  int i =0;
  int count = 5;
  while (count>i) {
  System.out.println(count);
  count--;
  }
 }
}
```

Output:



3. public class DoWhileIncorrectCondition {

```
public static void main(String[] args) {
    int num = 0;
    do {
    System.out.println(num);
    num++;
    } while (num > 0);
} }
```

Error : output is in infinite loop

Q.Why does the loop only execute once?

Ans: Because in while loop condition is (num<0)

Q. What is wrong with the loop condition in the `do while loop?

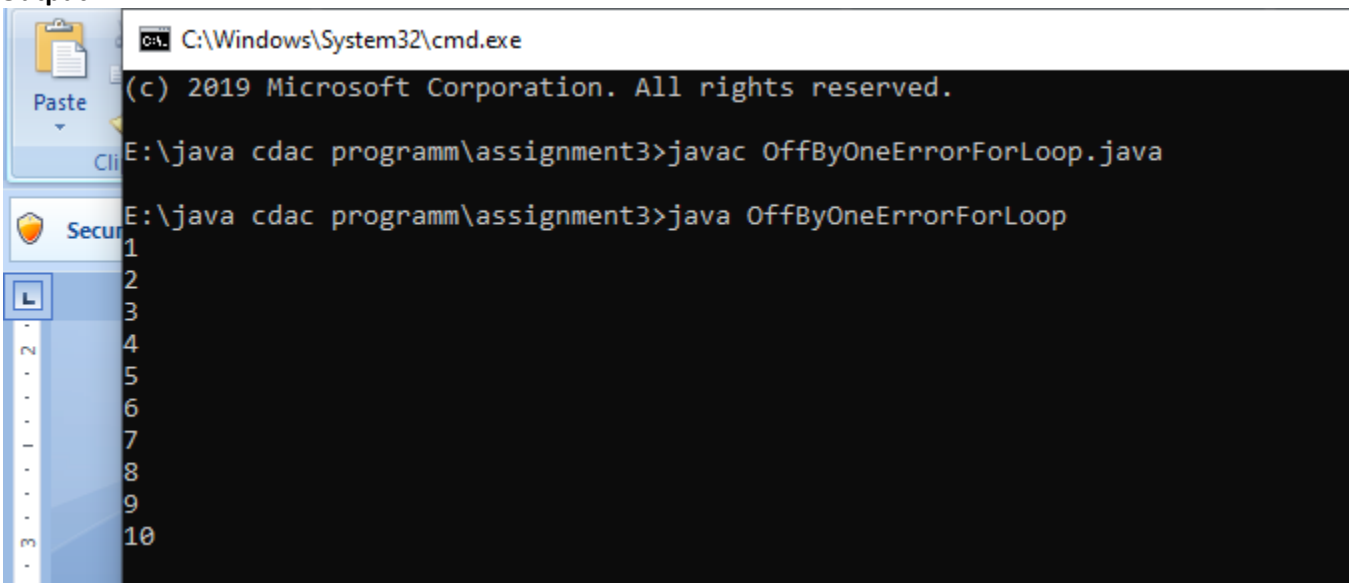
Ans : Do while loop at least one time program is exectuded.

```
Public class DoWhileIncorrectCondition {
  public static void main(String[] args) {
    int num = 0;
    do {
    System.out.println(num);
    num++;
    } while (num < 0);
} }
```

4.

```
public class OffByOneErrorForLoop {
public static void main(String[] args) {
  for (int i = 1; i < =10; i++) {
    System.out.println(i);
    }
    }
    }
```

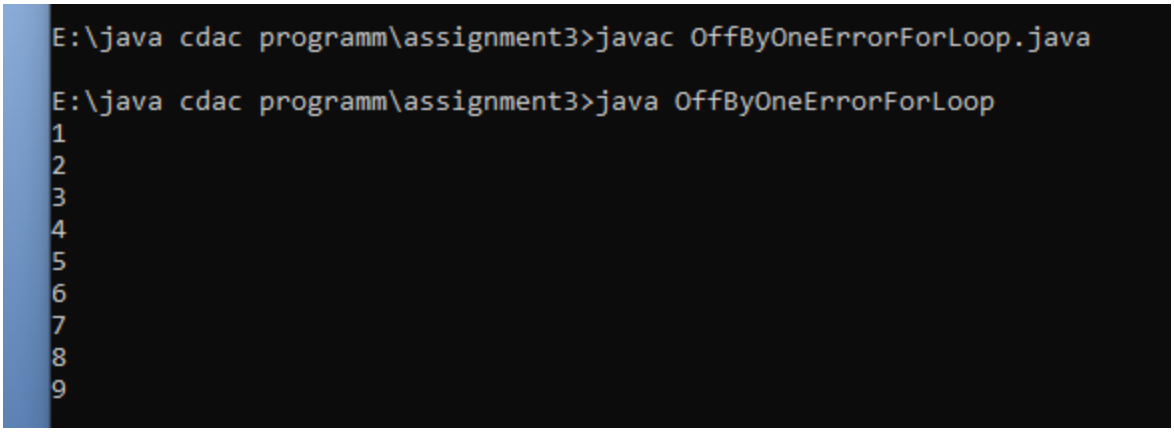
Output :



Expected code:

```
public class OffByOneErrorForLoop {
public static void main(String[] args) {
  for (int i = 1; i < 10; i++) {
    System.out.println(i);
    }
    }
    }
```

Expected output:



5.

```
public class WrongInitializationForLoop {
 public static void main(String[] args) {
    for (int i = 10; i>= 0; i++) {
      System.out.println(i);
      }
      }
      }
```

Q.Why does this loop not print numbers in the expected order?

Ans : Because here no termination condition write. So loop is in inifinite.

What is the problem with the initialization and update statements in the `for` loop?

Ans: in for loop condition statement is wrong “i—“ is correct statement.

Correct program

```
public class WrongInitializationForLoop {
 public static void main(String[] args) {
    for (int i = 10; i>= 0; i--) {
      System.out.println(i);
      }
      }
      }
```

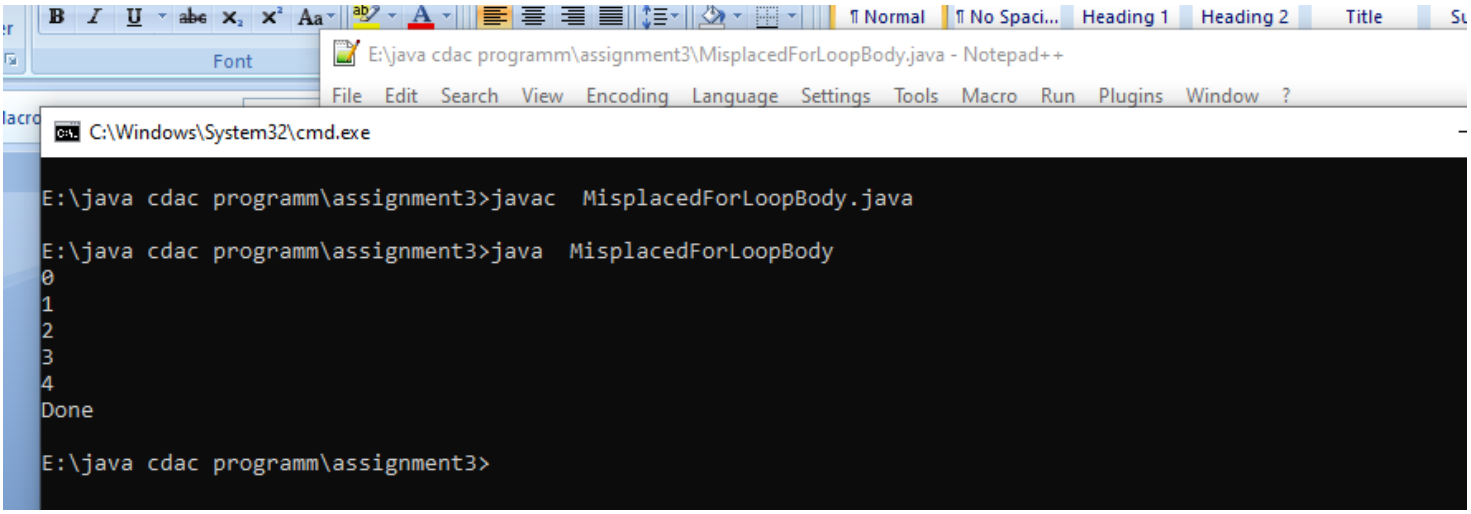
Output

6.

Program

```
public class MisplacedForLoopBody {
    public static void main(String[] args) {
        for (int i = 0; i < 5; i++)
            System.out.println(i);
        System.out.println("Done");
    }
}
```

Output



Error to investigate:

Q.Why does "Done" print only once, outside the loop?

Ans: because after for loop curly bracket is missing so for loop is take it only next statement and executed after loop is false. Control is go to next line.

How should the loop body be enclosed to include all statements within the loop?

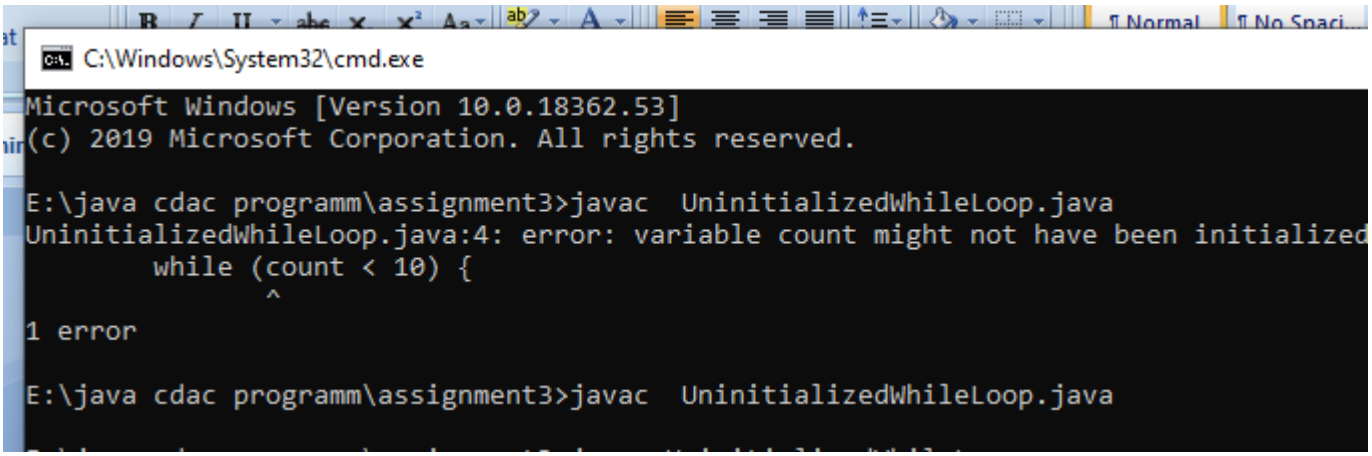
Expected progrom:

```
public class MisplacedForLoopBody {
        public static void main(String[] args) {
                for ( int i = 0; i < 5; i++){
                        System.out.println(i);
                        System.out.println("Done");
                }
        }
}
```

7.

```
public class UninitializedWhileLoop {
  public static void main(String[] args) {
  int count=0;
    while (count < 10) {
        System.out.println(count);
            count++;
     }
    }
}
```

Error: in while loop we cannot direct variables are intializ so 1st outside of while loop declare and define variable is must in while loop.

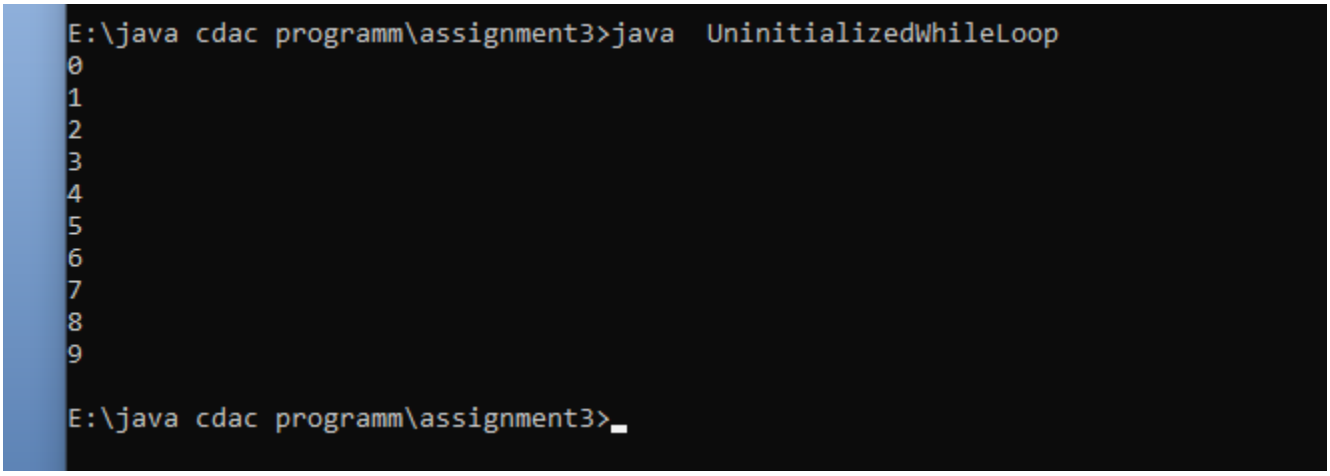


Correct code:

```
public class UninitializedWhileLoop {
  public static void main(String[] args) {
  int count=0;
```

```
    while (count < 10) {
            System.out.println(count);
                count++;
     }
    }
}
```

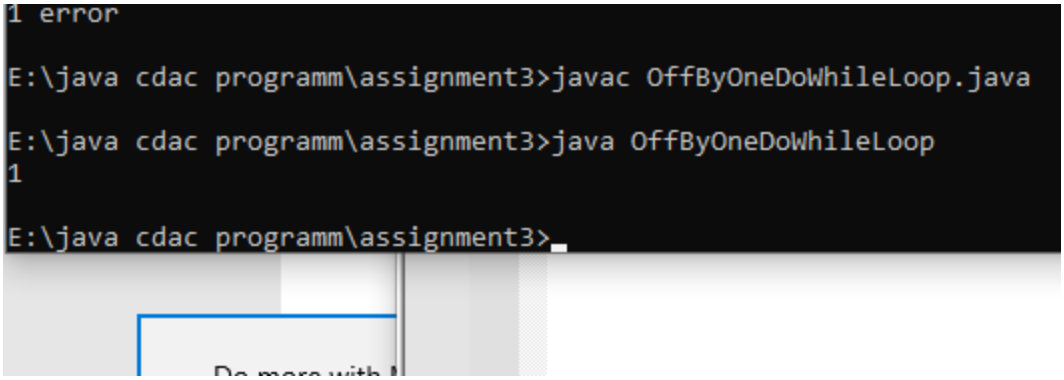
Output:



8.

```
public class OffByOneDoWhileLoop {
 public static void main(String[] args) {
   int num = 1;
    do {
     System.out.println(num);
    num--;
      } while (num > 0);
  }
}
```

Output



Q. Why does this loop print unexpected numbers?

Because in while loop we cannot given while(num>0) type condition.And output is only 1 print because do while loop at least one time.

What adjustments are needed to print the numbers from 1 to 5?

Ans: public class OffByOneDoWhileLoop {

public static void main(String[] args) {

int num = 1;

int no=5;

do {

System.out.println(num);

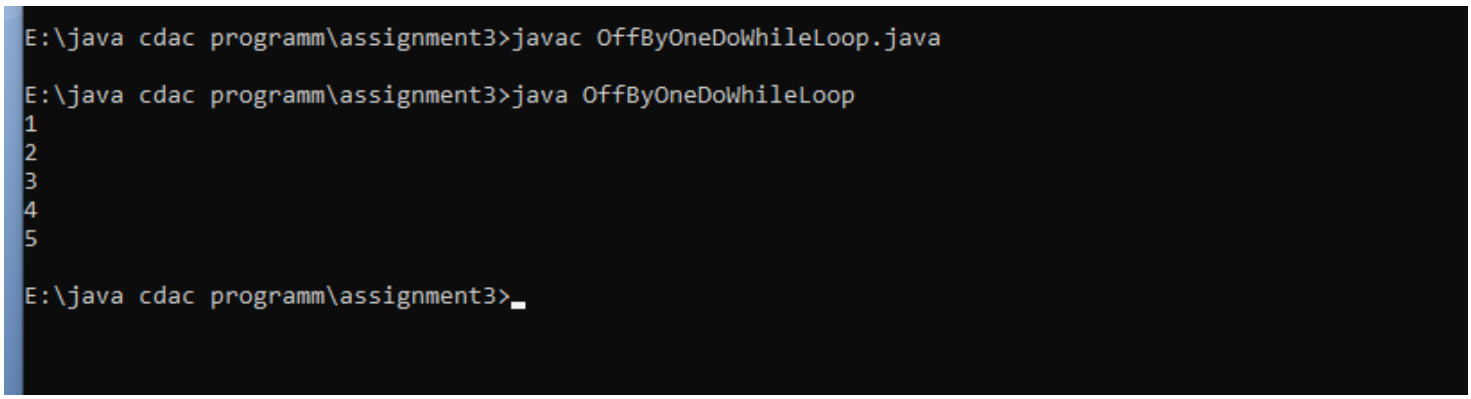
num++;

} while (num <= no);

}

}

Output



9.

public class InfiniteForLoopUpdate {

public static void main(String[] args) {

for (int i = 0; i < 5; i += 2) {

```
        System.out.println(i);
        }
        }
        }
```

Why does the loop print unexpected results or run infinitely?

Ans: output 0,2,4 print because in for loop i (i+=2) is incremented and assign by 2 so 0,2,4 print

How should the loop update expression be corrected?

Ans: for loop I is incremented and assign by 1(I+=1)

Program

```
public class InfiniteForLoopUpdate {
 public static void main(String[] args) {
    for (int i = 0; i < 5; i += 1) {
        System.out.println(i);
        }
        }
        }
```

```
E:\java cdac programm\assignment3>javac  InfiniteForLoopUpdate.java

E:\java cdac programm\assignment3>java  InfiniteForLoopUpdate
0
1
2
3
4

E:\java cdac programm\assignment3>
```

10.

```
public class IncorrectWhileLoopControl {
 public static void main(String[] args) {
 int num = 10;
    while (num =10) {
        System.out.println(num);
        num--;
 }
 }
```

}

No infinite loop here but in while loop is wrong in while loop we cannot initialize the variable or assign.

Correct code:

```
public class IncorrectWhileLoopControl {
 public static void main(String[] args) {
 int num = 10;
int i=0;
    while (num >i) {
            System.out.println(num);
            num--;
            }
            }
            }
```

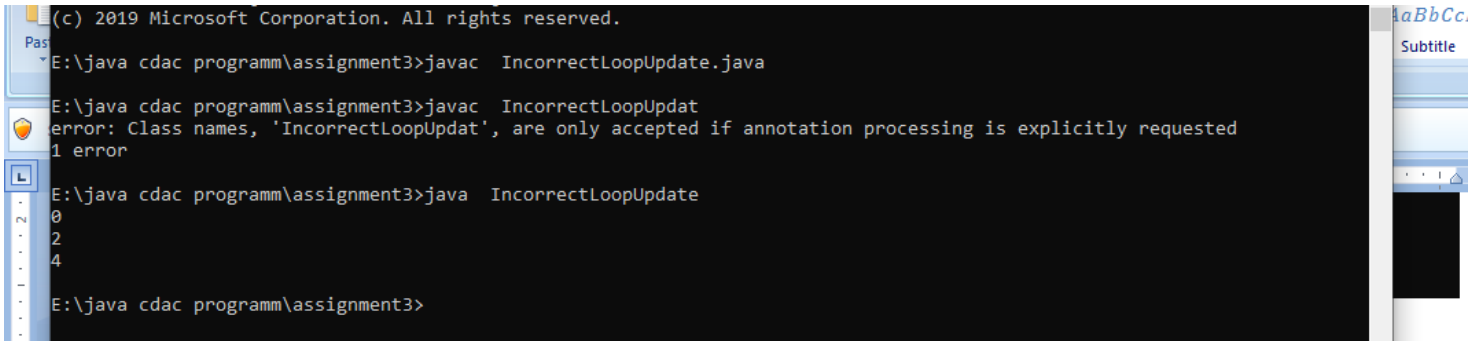
Output

```
E:\java cdac programm\assignment3>java IncorrectWhileLoopControl
10
9
8
7
6
5
4
3
2
1

E:\java cdac programm\assignment3>
```

11.
```
public class IncorrectLoopUpdate {
   public static void main(String[] args) {
      int i = 0;
   while (i < 5) {
      System.out.println(i);
        i +=2; // Error: This may cause unexpected results in output
                }
                }
                }
```

What will be the output of this loop?



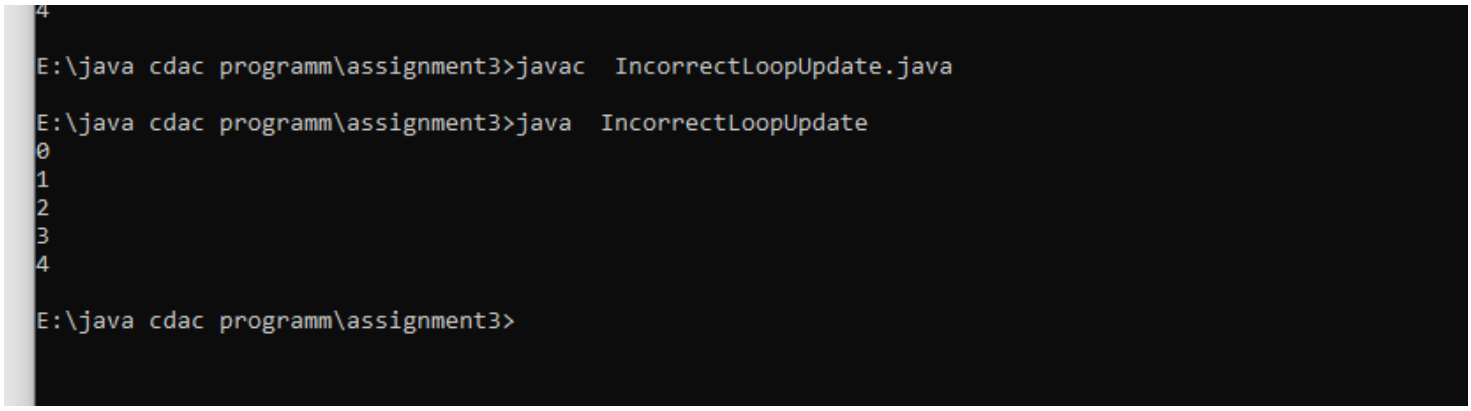
How should the loop variable be updated to achieve the desired result?

Ans: i+=1;

Correct code:

```
public class IncorrectLoopUpdate {
public static void main(String[] args) {
        int i = 0;
while (i < 5) {
        System.out.println(i);
    i +=1; // Error: This may cause unexpected results in output
                }
                }
                }
```

Correct output

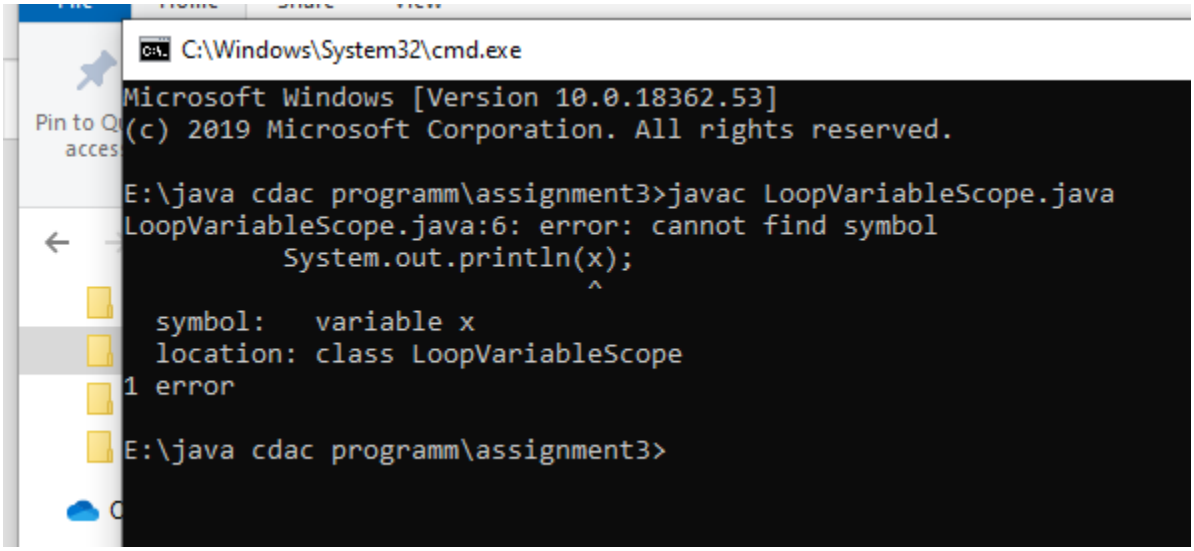


12. public class LoopVariableScope {

```
public static void main(String[] args) {
for (int i = 0; i < 5; i++) {
  int x = i * 2;
        }
```

```
        System.out.println(x);
        // Error: 'x' is not accessible here
        }
        }
```

Error:



Why does the variable 'x' cause a compilation error?

Ans: Because X is define in for loop and try to print in out of for loop.

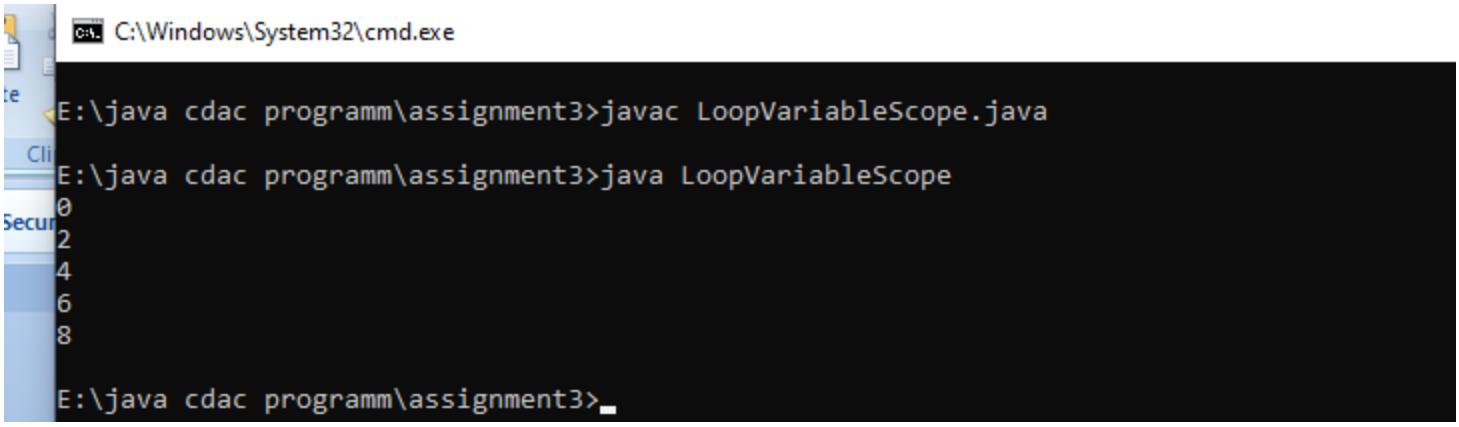
How does scope

Ans: its scope is only in for loop.

Correct code:

```
public class LoopVariableScope {
  public static void main(String[] args) {
  for (int i = 0; i < 5; i++) {
    int x = i * 2;
  System.out.println(x); }
        // Error: 'x' is not accessible here
        }
        }
```

Correct output



SECTION B

Snippet 1:

```
public class NestedLoopOutput {
 public static void main(String[] args) {
    for (int i = 1; i <= 3; i++) {
    for (int j = 1; j <= 2; j++) {
          System.out.print(i + " " + j + " ");
    }
 System.out.println();
  }
}
 }
```

I	J	iterations	
I=1	J=1	J=1,i=1 J=2,i=1 J=3	stop
I=2	J=1 J=2	I=2,j=1 I=2,j=2 I=2,j=3	stop
I=3	J=1 J=2	I=3,j=1 I=3,j=2 I=3,j=3	stop

```
class DecrementingLoop {
   public static void main(String[] args) {
     int total = 0;
   for (int i = 5; i > 0; i--) {
     total += i;
     if (i == 3)
              continue;
     total -= 1;
  }
  System.out.println(total);
  }
  }
```

Output:

I	**total**	**I**
I=5	**Total=0+i=0+5=5** **Total =5-1=4**	**i=4**
I=4	**Total=4+4=8** **Total=8-1=7**	**I=3**
I=3	**Total =7+3=10**	**I=2**
I=2	**Total =10+2=12** **Total= 12-1=11**	**I=1**

3.

```
class WhileLoopBreak {
   public static void main(String[] args) {
     int count = 0;
     while (count < 5) {
     //System.out.print(count + " ");
     count++;
     if (count == 3)
     break;
     }
```

```
System.out.println(count);
  }
  }
```

Count=0	Count=0	
Count=1	Count=1	
Count=2	Count=2	
Count=3	Loop stop	Final output count=3

4.
```
class DoWhileLoop {
  public static void main(String[] args) {
  int i = 1;
  do {
  System.out.print(i + " ");
  i++;
  } while (i < 5);
   System.out.println(i);
   }
   }
```

input	Output
I=1	I=1
I=2	I=2
I=3	I=3
I=4	I=4
I=5	Loop is over

Final output is i=5

5.class ConditionalLoopOutput {

```
 public static void main(String[] args) {
 int num = 1;
 for (int i = 1; i <= 4; i++) {
 if (i % 2 == 0) {
 num += i;
 System.out.println(num);
 }
 else {
 num -= i;
 System.out.println(num);
 }
 }
    System.out.println(num);
      }
      }
```

I=1,num=1-1=0	Num=0	
I=2,num= 0+2=2	Num=2	
I=3,num=2-3=-1	Num=-1	
I=4,num=4+(-1)=3	Num=3	Loop over
		Final output=3

6.class IncrementDecrement {

```
  public static void main(String[] args) {
  int x = 5;
  int y = ++x - x-- + --x + x++;
     System.out.println(y);
}
}
```

Output:

(++x)- (x--)+(--x) +(x++)

= 6 - 6 + 4 +4

OUTPUT: =8

7.class NestedIncrement {

public static void main(String[] args) {

int a = 10;

int b = 5;

int result = ++a * b-- - --a + b++;

System.out.println(result);

}

}

OUTPUT:

++a * b-- – --a + b++

11* 5 - 10 + 4//ACCORDING TO PRCEDENCE

= 55-10+4

=45+4

=49

8. class LoopIncrement {

public static void main(String[] args) {

int count = 0;

for (int i = 0; i < 4; i++) {

count += i++ - ++i;

}

System.out.println(count);

} }

I=0	Count= 0 Count= 0 – 2=-2	Count=-2
I=3	Count= -2 Count= 3-5=-2 Count+= -2 (-2)+(-2)=-4	Count=4

SECTION C

1. **Write a program to calculate the sum of the first 50 natural numbers?**

```
class sum{
public static void main(String[]args){
int i =0;
int add=0;
for( ;i<=50;i++){
add=add+i;
}
System.out.println("Addition of 50 nuturals nu :" +add);
}
}
```

2. **Write a program to compute the factorial of the number 10.**

```
class demo{
public static void main (String[]args){
int i=1;
int j=1;
int n=10;
for (i=1;i<=10;i++){
    j=i*j;
System.out.println("Factorial nu "+i+" is :" +j);
}
}
}
```

3. **Write a program to print all multiples of 7 between 1 and 100.**

```
class demo{
public static void main (String[]args){
int i=0;

for (i=0;i<=100;i+=7){

System.out.println("7 multiples  nu : " +i);
}
}
}
```

4. **Write a program to reverse the digits of the number 1234. The output should be 4321.**

```
class demo {
   public static void main(String[] args) {
      int num = 1234;
      int rev = 0;
      while(num != 0) {
         int rem = num%10;//remider =4;reminder=3 etc
      System.out.println(rem);
      System.out.println(num);//1234
         rev = (rev * 10) + rem;//

         num = num/10;
```

```
        System.out.println(num);//123


        }
        System.out.println(rev);
    }
}
```

5. Write a program to print the Fibonacci sequence up to the number 21.

```
class   Fibonachi {
  public static void main(String[] args) {

    int n = 21, firstTerm = 0, secondTerm = 1;
    System.out.println("Fibonacci Series till " + n + " terms:");

    for (int i = 1; i <= n; ++i) {s
      System.out.print(firstTerm + ", ");


      int nextTerm = firstTerm + secondTerm;
      firstTerm = secondTerm;
      secondTerm = nextTerm;
    }
  }
}
```

6. Write a program to find and print the first 5 prime numbers.

```
public class Program6 {
public static void main(String[] args) {

int num =15;
int i = 2;
while(num > 0) {
int count = 0;
for(int j=2; j<=i; j++) {
if(i%j == 0) {
count++;
if(count > 1) {
break;
}
}
}
if(count == 1){
System.out.println(i+" ");
num--;
}
i++;
}
}

}
```

7. Write a program to calculate the sum of the digits of the number 9876. The output should be 30 (9 + 8 + 7 + 6).

```
class demo{
```

```
public static void main(String[] args){
int nu= 9876;
int nu1=0;
int add=0;
while(nu!=0){
nu1=nu%10;
//System.out.println(nu1);//9
add=nu1+add;
System.out.println(add);//9
nu= nu/10;
//System.out.println(nu);//987
}
}
}
```

8. Write a program to count down from 10 to 0, printing each number.

```
class demo{
public static void main(String[]args){
int i=10;
for(i=10; i>=0;i--){
System.out.println(i);}
}
}
```

9.Write a program to find and print the largest digit in the number 4825.

10.Write a program to print all even numbers between 1 and 50.

```
class demo{
public static void main(String[]args){
int i=0;
for(i=0;i<=50;i+=2){
System.out.println("even nu :" +i);
}
}
}
```

11. Write a Java program to demonstrate the use of both pre-increment and post-decrement operators in a single expression.

```
class demo{
public static void main(String[]args){
int a=10,b=5,c=11,result;
result=a++ + ++b + ++c + c++;
System.out.println("output :" +result);
}
}
```

PATTERN QUESTION

12. Write a program to draw the following pattern:

```
*****
 *****
 *****
*****
*****
```

Program

```
class demo{
```

```
public static void main(String[]args){
int i=1;
int j=1;
for(i=1;i<=5;i++){
  for(j=1;j<=5;j++){
System.out.print("*");
}
System.out.println("");
}
}
}
```

13. Write a program to print the following pattern:

1

2*2

3*3*3

4*4*4*4

5*5*5*5*5

5*5*5*5*5

4*4*4*4

3*3*3

2*2

1

Program

```
class demo{
public static void main(String[]args){
int i=1;
int j=1;
for(i=1;i<=5;i++){
  for(j=1;j<=i;j++){
```

```
  System.out.print(+i);
  System.out.print("*");
}
System.out.println("");
  }
 for(i=5;i>=0;i--){
   for(j=1;j<=i;j++){
          System.out.print(+i);
    System.out.print("*");
}
System.out.println("");
 }
}
}
```

14. Write a program to print the following pattern:

```
*
 **
 ***
 *****
 *******
 *********
```

program

```
class Demo1{
      public static void main(String args[]){
               int n =10;
              for(int i=1;i<=n;i++){
                       if(i%2==0&&i>2){
                              continue;
                       }
                       for(int j=1;j<=i;j++){
                            System.out.print("*");
                        }
                        System.out.println();
             }

    }
}
```

15. Write a program to print the following pattern:

```
*
**
***
****
*****
```

program

```
                int n=7;
       for(int i=1; i<=n; i++) {
          for(int j=1; j<=n;j++) {
```

```
            if(j<=n-i){
               System.out.print(" ");
            }else{
               System.out.print(" *");
            }

         }
         System.out.println();

      }
```

16. Write a program to print the following pattern:

```
   *
  ***
 *****
 *******
*********
```

program

```
class demo{
public static void main(String[]args){
int n=10;
      for(int i=1; i<=n; i+=2) {
         for(int j=1; j<=n;j+=1) {
            if(j<=n-i){//j=1<9=10-1 still j=9 hot nahi toparet ha loop flase honar nahi ani * print honar nahi
               System.out.print(" ");
            }else{
               System.out.print(" *");
            }
```

```
        }
        System.out.println();


    }
}}
```

17. Write a program to print the following pattern:

```
*****
 ****
 ***
  **
  *
```

Program

```
        class demo{
public static void main(String[]args){
int n=1;
    for(int i=5; i>=n; i--) {
        for(int j=5; j>=n;j--) {
            if(j>=n+i){
                System.out.print(" ");
            }else{
                System.out.print(" *");
            }
        }
        System.out.println();


    }
}
}
```

18. Write a program to print the following pattern:

```
  *
 ***
*****
*******
*****
***
 *
```

program

```
 class demo{
public static void main(String[]args){
int i=1;
int j=1;
for(i=1;i<=5;i++){
 for(j=1;j<=i;j++){
  //System.out.print(+i);
  System.out.print("*");
}
System.out.println("");
  }
 for(i=5;i>=0;i--){
   for(j=1;j<=i;j++){
          //System.out.print(+i);
    System.out.print("*");
}
System.out.println("");
 }
}
```

}

19. Write a program to print the following pattern:

1

1*2

1*2*3

1*2*3*4

1*2*3*4*5

Program

23. Write a program to print the following pattern:

11111

22222

33333

44444

55555

Program

```
class demo2{
public static void main (String[] args){
int i,j;
for (i=1;i<=5;i++){
for (j=1;j<=5;j++){
System.out.print(+i);
//System.out.println("");
}
System.out.println("");
}
}
}
```

24. Write a program to print the following pattern:

1

22

333

4444

55555

Program

```
class demo2{
public static void main (String[] args){
 int i,j;
 int n=1;
 for (i=1;i<=5;i++){
        for (j=1;j<=n;j++){
        //n++;
                System.out.print(+i);

        }n++;
        System.out.println("");
 }
}
}
```

Q.25 Write a program to print the following pattern:

1

12

123

1234

12345

Program

```
class demo2{
public static void main (String[] args){
 int i,j;
 int n=1;
 for (i=1;i<=5;i++){
        for (j=1;j<=i;j++){
        //n++;
                //System.out.print(+i);
                System.out.print(+j);

        }//n++;
        System.out.println("");
 }
}
}
```

26. Write a program to print the following pattern:

1

2 3

4 5 6

7 8 9 10

11 12 13 14 15

Program

```
class demo2{
public static void main (String[] args){
 int i,j;
 int n=1;
```

```
 for (i=1;i<=5;i++){
for(j=1;j<=i;j++){
System.out.print(n++ );
//n--;
}
        System.out.println();

 }
}
}
```