**Error Detection and Correction**

**Snippet 1:**

public class InfiniteForLoop {

public static void main(String[] args) {

for (int i = 0; i < 10; i--) {

System.out.println(i);

}

}

}

**Error:** error is in the condition a loop that is I < 10 ; and I is decrementing in every iteration this cause the loop goes in infinite loop   
  
**Correction:** neew to chage condtion to I <10 or I <= 10 and i++. Or i >= -10;

**Snippet 2:**

public class IncorrectWhileCondition {

public static void main(String[] args) {

int count = 5;

while (count = 0) {

System.out.println(count);

count--;

}

}

}

**Error:** error is in the condition of while loop where condition is count = 0; here is the syntax error we can not write =0 we need to write “==”.

**Correction :** we need to change the condition to “count >= 0”.

**Snippet 3:**

public class DoWhileIncorrectCondition {

public static void main(String[] args) {

int num = 0;

do {

System.out.println(num);

num++;

} while (num > 0);

**Error:** error is in the the condition where condition is num > 0 by this code will go in infinite loop because for every iteration num will be greater than 0;

**Correction:** we need to chnge the conditipn from num > 0 to num < anynum(natural number) or num <= number.

**Snippet 4:**

public class OffByOneErrorForLoop {

public static void main(String[] args) {

for (int i = 1; i <= 10; i++) {

System.out.println(i);

}

// Expected: 10 iterations with numbers 1 to 10

// Actual: Prints numbers 1 to 10, but the task expected only 1 to 9

}

}

**Error:** expected output is 1 to 9 but it prints 1 to 10 due to wrong condtion that I i<= 10 tthis need to change

Iteration goes till 10.

**Correction:** we need to change condition to “i < 10”.

**Snippet 5:**

public class WrongInitializationForLoop {

public static void main(String[] args) {

for (int i = 10; i >= 0; i++) {

System.out.println(i);

}

}

}

**Error:**  error is the the for loop state ment where printing start from 10 we give intializtio of I = 10 which is wrong

If we have give I = 10, we need to change increment decrement statement . number should decrement.

**Correction :**  for (int i = 10; i >= 0**; i--)** or for (**int i = 0**; **i <= 10**; i++)

**Snippet 6:**

public class MisplacedForLoopBody {

public static void main(String[] args) {

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

System.out.println(i);

System.out.println("Done");

}

}

**Error :** there error that printing statement are not enclosed in the for loop ;

**Correction:** we need to enclosed the printing state ment in for loop

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

System.out.println(i);

System.out.println("Done");

}

**Snippet 7:**

public class UninitializedWhileLoop {

public static void main(String[] args) {

int count;

while (count < 10) {

System.out.println(count);

count++;

}

}

}

**Error :**  herer is the compilation error due count is not initialized we need to initialized.

**Correction:** initialize the count variable that is int **“count = 0;”**

**Snippet 8:**

public class OffByOneDoWhileLoop {

public static void main(String[] args) {

int num = 1;

do {

System.out.println(num);

num--;

} while (num > 0);

}

}

**Error :** work is to print number from 1 to 5 but here error is that instead of incrementing num code is decrementing and also the condtion is not correct.

**Correction:**  condition need to change to while **(num <= 5);** and incrementing statement should be **num++**

**Snippet 9:**

public class InfiniteForLoopUpdate {

public static void main(String[] args) {

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

System.out.println(i);

}

}

}

**Error :** there is **no error** loop is running for finite number printing the even numbers.

**Snippet 10:**

public class IncorrectWhileLoopControl {

public static void main(String[] args) {

int num = 10;

while (num = 10) {

System.out.println(num);

num--;

}

}

}

**Error:** error is in the condition statement that is codition should be == or >=, <= and also the instead of 10 there should be 0 in the condition statement.

**Correction:** need to change condition to **while (num >= 0) .**

**Snippet 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

}

}

}

**Error:** if we want to print the the numbers sequence from 0 to 4 the there is error and if we want only even numbers from 0 to 4 the it is correct.

**Correction :**  if we want ot print the numbers sequentiall from 0 to 4 then need to chane the increment statement to **i+=1.**

**Snippet 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 :** here x is not accessible because x is decleared in the loop and is in the scope of only upto for loop we can not access it outside the for loop.

**Correction:** we need to write printing statement in the for loop.

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

int x = i \* 2;

System.out.println(x);

}

**Guess the Output**

**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();

}

}

}

**OutPut**: **1 1 1 2**

**2 1 2 2**

**3 1 3 2**

**Snippet 2:**

public 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:** **11**

**Snippet 3:**

public 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);

}

}

**Output: 0 1 2 3**

**Snippet 4:**

public class DoWhileLoop {

public static void main(String[] args) {

int i = 1;

do {

System.out.print(i + " ");

i++;

} while (i < 5);

System.out.println(i);

}

}

**Output: 1 2 3 4 5**

**Snippet 5:**

public class ConditionalLoopOutput {

public static void main(String[] args) {

int num = 1;

for (int i = 1; i <= 4; i++) {

if (i % 2 == 0) {

num += i;

} else {

num -= i;

}

}

System.out.println(num);

}

}

**Output: 3**

**Snippet 6:**

public class IncrementDecrement {

public static void main(String[] args) {

int x = 5;

int y = ++x - x-- + --x + x++;

System.out.println(y);

}

}

**Output: 8**

**Snippet 7:**

public 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: 49**

**Snippet 8:**

public 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);

}

}

**Output: -4**