Section 1 – Error-Driven Learning Assignment: Loop Errors  **Snippet 1:**

public class InfiniteForLoop {

public static void main(String[] args) {

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

System.out.println(i);

}

}

}

**Error –**

class Main is public, should be declared in a file named Main.java

public class Main and gets infinite print of i

**explanation –**

public should be remove in first line and This loop runs infinitely because the loop control variable i is decremented (i--) in each iteration, rather than incremented. Therefore, i will never be greater than or equal to 10, so the condition i < 10 will always be true so change the i-- to i++ to increment i in each iteration.

**Corrected code**

class InfiniteForLoop {

public static void main(String[] args) {

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

System.out.println(i);

}

}

}

**Snippet 2:**

public class IncorrectWhileCondition {

public static void main(String[] args) {

int count = 5;

while (count = 0) {

System.out.println(count);

count--;

}

}

}

**Error –**

class Main is public, should be declared in a file named Main.java

error: incompatible types: int cannot be converted to boolean

while (count = 0)

**explanation –**

public should be remove in first line and int can’t be converted to Boolean so in while change count=0 to count>0

**Corrected code**

class IncorrectWhileCondition {

public static void main(String[] args) {

int count = 5;

while (count > 0) {

System.out.println(count);

count--;

}

}

}

**Snippet 3:**

public class DoWhileIncorrectCondition {

public static void main(String[] args) {

int num = 0;

do {

System.out.println(num);

num++;

} while (num > 0);

}

}

**Error –**

class Main is public, should be declared in a file named Main.java

it gets infinite output

**explanation –**

Change the condition to num < 10 (or any other desired upper bound) to make the loop execute multiple times. Also, it might be desirable to initialize num to 1.

**Corrected code**

class DoWhileIncorrectCondition {

public static void main(String[] args) {

int num = 1;

do {

System.out.println(num);

num++;

} while (num <10 );

}

}

**Snippet 4:**

public class OffByOneErrorForLoop {

public static void main(String[] args) {

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

System.out.println(i);

}

}

}**Error –**

class Main is public, should be declared in a file named Main.java

it print 1 to 10

**explanation –**

remove public in first line and change the condition in for loop to i<10.

**Corrected code**

class OffByOneErrorForLoop {

public static void main(String[] args) {

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

System.out.println(i);

}

}

}

**Snippet 5:**

public class WrongInitializationForLoop {

public static void main(String[] args) {

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

System.out.println(i);

}

}

}

**Error –**

class Main is public, should be declared in a file named Main.java

it doesn’t print anything.

**explanation –**

remove public in first line and change the condition in for loop to (int i = 0; i <= 10; i++).

**Corrected code**

public class WrongInitializationForLoop {

public static void main(String[] args) {

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

System.out.println(i);

}

}

}

**Snippet 6:**

class MisplacedForLoopBody {

public static void main(String[] args) {

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

System.out.println(i);

System.out.println("Done");

}

}

**Error –**

class Main is public, should be declared in a file named Main.java

**explanation –**

remove public in first line and for loop has no brackets so it is not open and close.

**Corrected code**

class MisplacedForLoopBody {

public static void main(String[] args) {

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

System.out.println(i);

System.out.println("Done");

}

}

}

**Snippet 7:**

class UninitializedWhileLoop {

public static void main(String[] args) {

int count;

while (count < 10) {

System.out.println(count);

count++;

}

}

}

**Error –**

class Main is public, should be declared in a file named Main.java

variable count might not have been initialized

while (count < 10)

**explanation –**

remove public in first line and count variable is not initialize so initialize it to 0.

**Corrected code**

class UninitializedWhileLoop {

public static void main(String[] args) {

int count=0;

while (count < 10) {

System.out.println(count);

count++;

}

}

}

**Snippet 8:**

public class OffByOneDoWhileLoop {

public static void main(String[] args) {

int num = 1;

do {

System.out.println(num);

num--;

} while (num > 0);

}

}

**Error –**

class Main is public, should be declared in a file named Main.java

**explanation –**

remove public in first line andchange num—to num++ & while(num<=5).

**Corrected code**

class OffByOneDoWhileLoop {

public static void main(String[] args) {

int num = 1;

do {

System.out.println(num);

num++;

} while (num <= 5);

}

}

**Snippet 9:**

class InfiniteForLoopUpdate {

public static void main(String[] args) {

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

System.out.println(i);

}

}

}

**Error –**

class Main is public, should be declared in a file named Main.java

**explanation –**

remove public in first line and If the goal is to print all numbers less than 5, increment i by 1 in each iteration (i++ or i += 1).

**Corrected code**

class InfiniteForLoopUpdate {

public static void main(String[] args) {

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

System.out.println(i);

}

}

}

**Snippet 10:**

public class IncorrectWhileLoopControl {

public static void main(String[] args) {

int num = 10;

while (num = 10) {

System.out.println(num);

num--;

}

}

}

**Error –**

class Main is public, should be declared in a file named Main.java

**explanation –**

Change the condition to num >= 0 or num > 0 to control the loop based on the value of num.

**Corrected code**

public class IncorrectWhileLoopControl {

public static void main(String[] args) {

int num = 10;

while (num >= 10) {

System.out.println(num);

num--;

}

}

}

**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 –**

class Main is public, should be declared in a file named Main.java

**explanation –**

change the update statement to i++ or i += 1.

**Corrected code**

class IncorrectLoopUpdate {

public static void main(String[] args) {

int i = 0;

while (i < 5) {

System.out.println(i);

i ++; // Error: This may cause unexpected results in output

}

}

}

**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 –**

class Main is public, should be declared in a file named Main.java

class LoopVariableScope is public, should be declared in a file named LoopVariableScope.java

public class LoopVariableScope {

^

snippet.java:5: error: variable x is already defined in method main(String[])

int x = i \* 2;

**explanation –**

Declare x outside the loop to make it accessible after the loop finishes

**Corrected code**

public class LoopVariableScope {

public static void main(String[] args) {

int x = 0; // Corrected: Declared x outside the loop

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

x = i \* 2;

}

System.out.println(x);

}

}