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**ASSIGNMENT 3 SECTION 1&2**

Snippet 1:

public class InfiniteForLoop {

public static void main(String[] args) {

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

System.out.println(i);

}

}

}

// Error to investigate: Why does this loop run infinitely? How should the loop control variable be adjusted?

**O/P**

error: class InfiniteForLoop is public, should be declared in a file named InfiniteForLoop.java

public class InfiniteForLoop {

// the loop control variable should be incremented(i++) instead of decremented(i--).

Snippet 2:

public class IncorrectWhileCondition {

public static void main(String[] args) {

int count = 5;

while (count = 0) {

System.out.println(count);

count--;

}

}

}

// Error to investigate: Why does the loop not execute as expected? What is the issue with the condition in the

`while` loop?

**O/P**

error: incompatible types: int cannot be converted to boolean

while (count = 0) {

//loop cannot be executed because int cannot be converted to Boolean. You need to use the comparison operator.

Snippet 3:

public class DoWhileIncorrectCondition {

public static void main(String[] args) {

int num = 0;

do {

System.out.println(num);

num++;

} while (num > 0);

}

}

// Error to investigate: Why does the loop only execute once? What is wrong with the loop condition in the `dowhile`

loop?

// If you intended for the loop to run while num is less than a certain value, the condition should be something like while (num < 20); or similar num to close the loop condition.

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 to investigate: What is the issue with the loop boundaries? How should the loop be adjusted to meet the

expected output?

1

2

3

4

5

6

7

8

9

10

//loop prints the num from 1-10 because of the condition that has (i<=10 )in it. The loop should be adjusted as i<10 to meet the expected output.

Snippet 5:

public class WrongInitializationForLoop {

public static void main(String[] args) {

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

System.out.println(i);

}

}

}

// Error to investigate: Why does this loop not print numbers in the expected order? What is the problem with the

initialization and update statements in the `for` loop?

// If you intended for the loop to run while num is less than a certain value, the condition should be something like while (num < 20); or similar num to close the loop condition.

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 to investigate: Why does "Done" print only once, outside the loop? How should the loop body be enclosed to

include all statements within the loop?

**O/P**

0

1

2

3

4

Done

**//**When no curly braces are used, only the first statement immediately following the for loop header is considered part of the loop body.The loop in the code only includes the System.out.println(i); statement.

Snippet 7:

public class UninitializedWhileLoop {

public static void main(String[] args) {

int count;

while (count < 10) {

System.out.println(count);

count++;

}

}

}

// Error to investigate: Why does this code produce a compilation error? What needs to be done to initialize the loop

variable properly?

**O/P**

error: variable count might not have been initialized

while (count < 10) {

//you need to initialize the count variable as count =0 or any num.

Snippet 8:

public class OffByOneDoWhileLoop {

public static void main(String[] args) {

int num = 1;

do {

System.out.println(num);

num--;

} while (num > 0);

}

}

// Error to investigate: Why does this loop print unexpected numbers? What adjustments are needed to print the

numbers from 1 to 5?

**O/P**

**1**

**//**loop print the unexpected num because of the condition (num--). Adjust the condition as (num++) and in while loop (num <=5).

Snippet 9:

public class InfiniteForLoopUpdate {

public static void main(String[] args) {

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

System.out.println(i);

}

}

}

// Error to investigate: Why does the loop print unexpected results or run infinitely? How should the loop update

expression be corrected?

**O/P**

**0**

**2**

**4**

**//**there is no infinite loop.

Snippet 10:

public class IncorrectWhileLoopControl {

public static void main(String[] args) {

int num = 10;

while (num = 10) {

System.out.println(num);

num--;

}

}

}

// Error to investigate: Why does the loop execute indefinitely? What is wrong with the loop condition?

**O/P**

**error: incompatible types: int cannot be converted to boolean**

**while (num = 10) {**

**//**there should be a condition in while num is as greater than 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 to investigate: What will be the output of this loop? How should the loop variable be updated to achieve the

desired result?

**O/P**

**0**

**2**

**4**

//we need to change the condition of (i+=2) as (i++)

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 to investigate: Why does the variable 'x' cause a compilation error? How does scope

**O/P**

**error: cannot find symbol**

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

**^**

**symbol: variable x**

**location: class LoopVariableScope**

//BECAUSE X IS DECLARED INSIDE THE FOR LOOP. THE SCOPE FOR X IS NOT ACCESSIBLE OUTSIDE THE LOOP.

**SECTION 2**

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();

}

}

}

// Guess the output of this nested loop.

**O/P**

**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);

}

}

// Guess the output of this loop.

**O/P**

**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);

}

}

// Guess the output of this while loop.

**O/P**

**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);

}

}

// Guess the output of this do-while loop.

**O/P**

**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);

}

}

// Guess the output of this loop.

**O/P**

**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);

}

}

// Guess the output of this code snippet.

**O/P**

**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);

}

}

// Guess the output of this code snippet.

**O/P**

**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);

}

}

// Guess the output of this code snippet.

**O/P**

**-4**