**DAY – 3(logic building0 Assignment**

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**Snippet 1:**

**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?**

**ANS🡪** this loop run infinitely because condition was no terminating the loop , for terminating loop we have to change in the place of” i- - " 🡪 **for (int i = 0; i < 10; i++)**

**Snippet 2:**

**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?**

**ANS**🡪 compile time error: incompatible types: int cannot be converted to boolean

while (count = 0) {

in while condition is given count=0 means in integer we want to store boolean value which an error(0 zero treat as false means boolean value)

**Snippet 3:**

**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?**

**ANS🡪** No, the loop execute infinite times , in dowhile condition should be terminating condition

**Snippet 4:**

**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?**

**ANS🡪** correct code for printing only 1 to 9: for(int I =1; i<10; i++) or for(int I =1; i<=9; i++)

**Snippet 5:**

**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?**

**ANS🡪 output(infinite loop),** this loop not print numbers in the expected order because in the place of increment (i++) write to decrement(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 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?**

**ANS🡪** Done print only once because it will treated as out of loop statement.

by semicolon the loop body be enclosed to include all statements within the loop

**Snippet 7:**

**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?**

**ANS🡪** this code produce a compilation error because count not initialized

Count = 1;

**Snippet 8:**

**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?**

**ANS🡪** output🡪 1

Expected o/p🡪 1 to 5

int num = 1;

do {

System.out.println(num);

num++;

} while (num > 6);

**Snippet 9:**

**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?**

**ANS🡪** output: 0

2

**Snippet 10:**

**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?**

**ANS🡪** error: incompatible types: int cannot be converted to Boolean 🡪 while (num = 10)

 **Assignment vs. Comparison:**

* The condition of the while loop is while (num = 10). In Java, the single = operator is an assignment operator, not a comparison operator.
* This means that instead of checking if num is equal to 10, the code is assigning the value 10 to num.

 **Loop Condition Result:**

* The assignment num = 10 always evaluates to 10, which is a non-zero value. In Java, any non-zero value is treated as true in a boolean context.
* As a result, the condition while (num = 10) always evaluates to true, causing the loop to run indefinitely.

**Snippet 11:**

**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?**

**ANS🡪output:** 0 2 4

loop variable be updated to achieve the desired result like 🡪 in increment in place of i+=2 write i++

**Snippet 12:**

**class LoopVariableScope {**

**public static void main(String[] args) {**

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

**int x = i \* 2;**

**}**

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

**}**

**}**

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

**ANS🡪** the variable ‘x’ cause a compilation error because ‘x’ is not accessible to print statement

X is out of scope

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**SECTION 2: Guess the Output**

**Snippet 1:**

**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();**

**}**

**}**

**}**

ANS🡪 i = 1 j=1,2 (o/p 🡪1 1 1 2)

i = 2 j=1,2 (o/p 🡪 2 1 2 2)

i = 3 j=1,2 (o/p 🡪 3 1 3 2)

**Snippet 2:**

**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);**

**}**

**}**

**ANS🡪** i =5 total = 0+5=5 total = 5-1 =4

i =4 total = 4+4=8 total = 8-1 = 7

i =3 total = 3+7=10

i =2 total = 2+10=12 total = 12-1 =11

i =1 total = 1+11=12 total = 12-1 = 11

OUTPUT 🡪 11

**Snippet 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);**

**}**

**}**

**ANS🡪** count =0 sop(0)

count =1 sop(1)

count =2 sop(2)

count=3 break

OUPUT -> 0 1 2 3

**Snippet 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);**

**}**

**}**

**ANS🡪** i=1 sop(1) i=2

i=2 sop(2) i=3

i=3 sop(3) i=4

i=4 sop(4) i=5

sop(5)

OUTPUT🡪 1 2 3 4 5

**Snippet 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;**

**} else {**

**num -= i;**

**}**

**}**

**System.out.println(num);**

**}**

**}**

**ANS🡪** num=1 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=-1+4=3

OUTPUT🡪 3

**Snippet 6:**

**class IncrementDecrement {**

**public static void main(String[] args) {**

**int x = 5;**

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

**System.out.println(y);**

**}**

**}**

**ANS🡪** x=5 y = (6-6=0)+ (4+4=8)==8

OUTPUT🡪 8

**Snippet 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);**

**}**

**}**

**ANS🡪** result = 11 \* 5 – 10 + 4 🡪 55-6 == 49

OUTPUT🡪49

**Snippet 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);**

**}**

**ANS🡪** count = 0 i=0 count = 0+0-2= -2 i= 2

Count = -2 i=2 count= -2+2-4= -4 i=4

OUTPUT🡪 count: -4