Assignment 3

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();
 }
 }
}
```

// Guess the output of this nested loop.

Dry Run :

i	Condition i<=3	j	Condition j<=2	Printing	
				I	j
1	1<=3 – true	1	1<=2 – true	1	1
		2	2<=2 – true	1	2
		3	3<=2 – false	-	-
Outside Inner loop – next line					
2	2<=3 – true	1	1<=2 – true	2	1
		2	2<=2 – true	2	2
		3	3<=2 – false	-	-

Outside Inner loop – next line					
3	3<=3 – true	1	1<=2 – true	3	1
		2	2<=2 – true	3	2
		3	3<=2 – false	-	-
Outside Inner loop – next line					
4	4<=3 – false				
Outside outer loop					

Output:

1 2 2 1

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);
 }
}
```

Dry Run :

Initially total = 0;

i	Condition i>0	total+=i	total-=1	i--	After each interation total
5	5>0 – true	5+0 = 5	5-1 = 4	4	4
4	4>0 – true	4+4 = 8	8-1 = 7	3	7
3	3>0 – true	7+3 = 10	Continue statement so skip		10
2	2>0 – true	10+2 = 12	12-1 = 11	1	11
1	1>0 – true	11+1 = 12	12-1 = 11	0	11
0	0>0 – false	Exit the loop			

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);
 }
}
```

Dry Run :

Initially count = 0;

Count	Count<5	Print Count	Count++	Count == 3
0	0<5 – true	0	1	False
1	1<5 – true	1	2	False
2	2<5 – true	2	3	False
3	3<5 – true	3	4	True – due to break condition exits

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);
 }
}
```

Dry Run :

Intially i=1

i	Print i	i++	while i<5
1	1	2	2<5 – true
2	2	3	3<5 – true
3	3	4	4<5 – true
4	4	5	5<5 – false

After the loop ends the SOP statement gets executed which is println(i) prints the output on same line on which the cursor is and then moves to next line.

So,

Output : 0 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);
}
}
```

Dry run :

Initially num=1

i	If(i%2) == 0 num+i	Else num-i	num at the end of each iteration
1	False	True 1-1 = 0	0
2	True 0+2 = 2	-	2
3	False	True 2-3 = -1	-1
4	True -1+4 = 3	-	3

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);
}
}
```

Dry run:

Here the initial value of x is 5

Expression is ++x – x-- + --x + x++

Pre-increment – Increment and then consider the value

Post-increment – Use the value then increment

Pre-decrement – decrement and use the value

Post-decrement – use the value and then decrement

So,

(++x) – (x--) + (--x) + (x++)

6 - 6 + 4 + 4 => 0+8 => 8

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);
 }
}
```

Dry run :

Initinal values a=10, b=5

Expression (++a) * (b--) - (--a) + (b++)

11 * 5 - 10 + 4 => 55 – 10 + 4 => 45 + 4 => 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);
 }
}
```

Dry run :

Initially count = 0

i	count i++ - ++i	i	count
0	0 – 2 = -2	2	0 + -2 = -2
2	2 – 4 = -2	4	-2 + -2 = -4

Output: -4