Assignment No- 3

SECTION 3: Lamborghini Exercise:

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();

}

}

}

Execution Steps:

i = 1

j = 1 → Print 1 1

j = 2 → Print 1 2

New line

i = 2

j = 1 → Print 2 1

j = 2 → Print 2 2

New line

i = 3

j = 1 → Print 3 1

j = 2 → Print 3 2

New line

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);

}

}

Execution Steps:

1. i = 5

total += 5 → total = 5

total -= 1 → total = 4

2. i = 4

total += 4 → total = 8

total -= 1 → total = 7

3. i = 3

total += 3 → total = 10

continue is executed, so total -= 1 is skipped

4. i = 2

total += 2 → total = 12

total -= 1 → total = 11

5. i = 1

total += 1 → total = 12

total -= 1 → total = 11

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);

}

}

Execution Steps:

1. count = 0

Print 0

Increment count → 1

2. count = 1

Print 1

Increment count → 2

3. count = 2

Print 2

Increment count → 3

if (count == 3) break; → Breaks the loop

4. After the loop, System.out.println(count); prints 3

Output

0 1 2 3

------------------------------------------------------------------------------------------------------------------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);

}

}

Execution Steps:

1. count = 0

Print 0

Increment count → 1

2. count = 1

Print 1

Increment count → 2

3. count = 2

Print 2

Increment count → 3

if (count == 3) break; → Breaks the loop

4. After the loop:

System.out.println(count); prints 3

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);

}

}

Execution Steps:

1. i = 1 → Print "1 " → i becomes 2

2. i = 2 → Print "2 " → i becomes 3

3. i = 3 → Print "3 " → i becomes 4

4. i = 4 → Print "4 " → i becomes 5

5. Condition (i < 5) is false, exit loop

6. Print i (which is now 5)

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);

}

}

Execution Steps:

1. Initial Value: num = 1

2. i = 1 (odd) → num = num - 1 = 0

3. i = 2 (even) → num = num + 2 = 2

4. i = 3 (odd) → num = num - 3 = -1

5. i = 4 (even) → num = num + 4 = 3

6. Loop ends, print num

Output

6

------------------------------------------------------------------------------------------------------------------Snippet 6

public class IncrementDecrement {

public static void main(String[] args) {

int x = 5;

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

System.out.println(y);

}

}

Execution Steps:

1. Initial value: x = 5

2. ++x (Pre-increment) → x = 6, so ++x evaluates to 6

3. x-- (Post-decrement) → x = 6 (used first), then x becomes 5

4. --x (Pre-decrement) → x = 4, so --x evaluates to 4

5. x++ (Post-increment) → x = 4 (used first), then x becomes 5

6. Expression evaluation:

y = 6 - 6 + 4 + 4

= 6 - 6 + 4 + 4

= 0 + 4 + 4

= 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);

}

}

Execution Steps:

1. Initial values: a = 10, b = 5

2. ++a (Pre-increment) → a = 11, so ++a evaluates to 11

3. b-- (Post-decrement) → b = 5 (used first), then b becomes 4

4. --a (Pre-decrement) → a = 10, so --a evaluates to 10

5. b++ (Post-increment) → b = 4 (used first), then b becomes 5

6. Expression evaluation:

result = (11 \* 5) - 10 + 4

= 55 - 10 + 4

= 49

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);

}

}

Execution Steps:

1. Initial values: count = 0, i = 0

2. Loop Iteration 1 (i = 0):

i++ (Post-increment) → i = 0 (used first), then i becomes 1

++i (Pre-increment) → i becomes 2, so ++i = 2

count += 0 - 2 → count = -2

3. Loop Iteration 2 (i = 3):

i++ (Post-increment) → i = 3 (used first), then i becomes 4

++i (Pre-increment) → i becomes 5, so ++i = 5

count += 3 - 5 → count = -4

4. Loop exits because i = 5 (not < 4)

Output

-4