

# Lecture 5

Loops

# Operator Precedence

```
int myInt = 12 - 4 * 2;
```

What will be the value of myInt?

myInt = (12 - 4) \* 2 or 12 - (4 \* 2) ?

# Operator Associativity

```
int A = 10;
```

```
int C = 50;
```

```
A = B = C
```

Associativity = Whether we evaluate from Left-to-Right or Right-To-Left?

Whenever an operand is shared by operators with the same precedence then we follow operator associativity rules.

# Operator Precedence Example

```
class Main {  
    public static void main(String[] args) {  
        // BODMAS = Bracket of Division Multiplication Addition Subtraction  
  
        /*  
        Since - and + have the same precedence in Java we follow associativity rules  
        Java says that associativity for - and + is from Left-to-Right  
        so we evaluate the below expression as (12 - 4) + 2;  
        */  
        int myInt = 12 - 4 + 2;  
        System.out.println(myInt);  
        // A) myInt = (12 - 4) + 2; = 10  
        // B) myInt = 12 - (4 + 2); = 6  
    }  
}
```

# Precedence in Java

Type	Operators	Precedence	Associativity
	Parenthesis, dot (.), [ ]	.[]()	Left to Right
Unary	Postfix	++ --	Right to Left
Unary	Prefix	++ -- + - ~ !	Right to Left
Arithmetic	Multiplicative	* / %	Left to Right
Arithmetic	Additive	+ -	Left to Right
Bitwise	Shift	<< >> >>>	Left to Right
Relational	Relational	< > <= >= instanceof	Left to Right
Relational	Equality	== !=	Left to Right
Bitwise	bitwise AND	&	Left to Right
Bitwise	bitwise exclusive OR	^	Left to Right
Bitwise	bitwise inclusive OR		Left to Right
Logical	logical AND	&&	Left to Right
Logical	logical OR		Left to Right
Ternary	Conditional	? :	Right to Left
Assignment	Assignment	= += = *= /= %= &=	Right to Left

```
int myInt = (2 + (4 - 5)) * (16 / 5) * 7;
```

# for loop

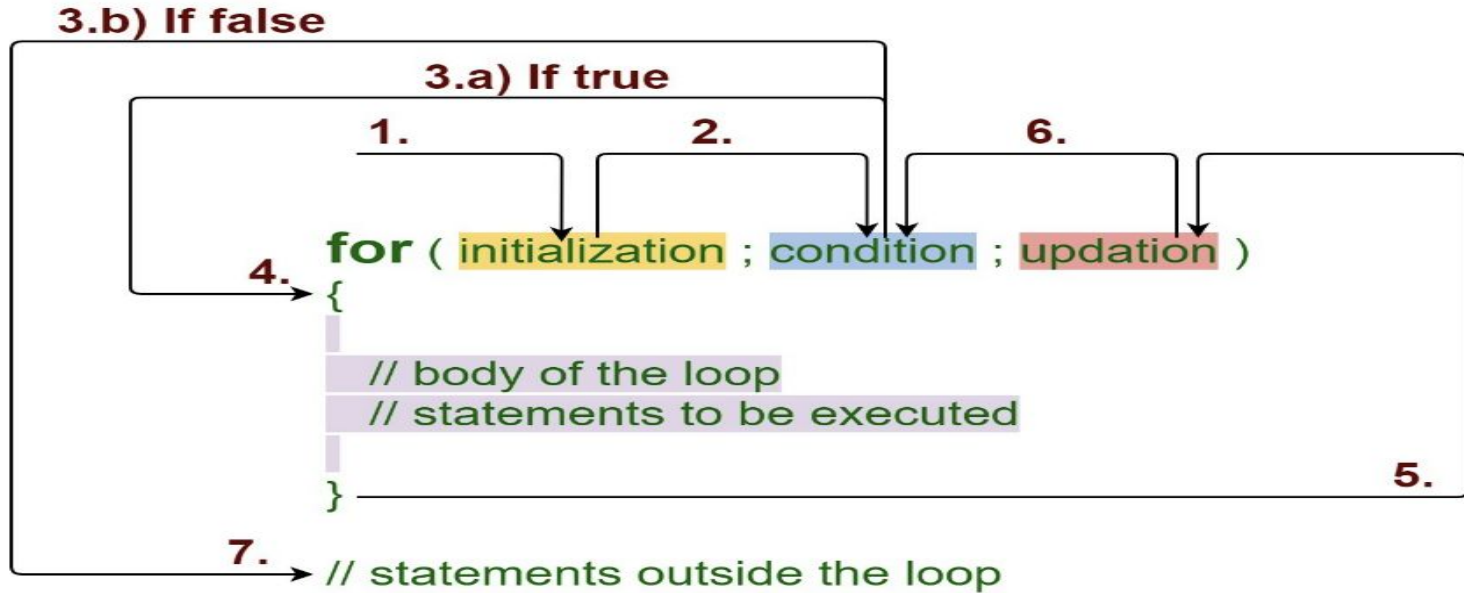
```
class Main {  
    public static void main(String[] args) {  
        for(int i = 0; i < 10; i++) {  
            System.out.println("Hello World");  
        }  
    }  
}
```

```
class Main {  
    public static void main(String[] args) {  
        // Firstly, set i = 1;  
        // Then check if i <= 10  
        // if previous condition true then execute loop body  
        // and increment the value of i  
        // else do not execute loop body  
        for(int i = 1; i <= 10; ++i) {  
            System.out.println(i); // loop body  
        }  
    }  
}
```



for loop

## For Loop



# What will happen if I remove terminating condition?

```
class Main {  
    public static void main(String[] args) {  
        for(int i = 0; ; i = i + 1) {  
            System.out.println("Hello World");  
        }  
    }  
}
```

# Print Hello World 10 times Refactored

```
class Main {  
    public static void main(String[] args) {  
        printHelloWorldTenTimes();  
    }  
  
    public static void printHelloWorldTenTimes() {  
        for(int i = 0; i < 10; i++) {  
            System.out.println( "Hello World" );  
        }  
    }  
}
```

# Average of n numbers

```
class Main {  
    public static void main(String[] args) {  
        System.out.println("Average of n numbers is " + getAverageOfNumbers(5));  
    }  
  
    public static int getAverageOfNumbers(int n) {  
        int summation = 0;  
  
        for(int i = 1; i <= n; i++) {  
            summation += i; // summation = summation + i;  
        }  
  
        return summation/n;  
    }  
}
```

# Print Alternate Numbers

```
class Main {  
    public static void main(String[] args) {  
        printAlternateNumbers(100);  
    }  
  
    public static void printAlternateNumbers(int n) {  
  
        for(int i = 0; i <= n; i = i + 2) {  
            System.out.println(i);  
        }  
    }  
}
```

# for loop with two variables

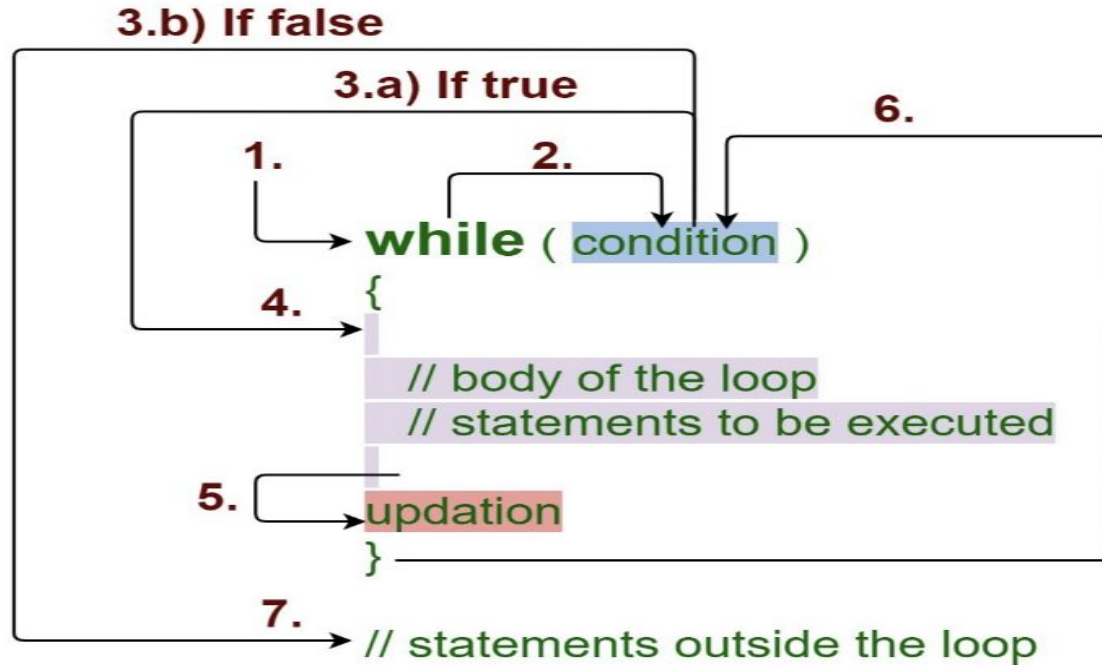
```
class Main {  
    public static void main(String[] args) {  
        // for loop with two variable i & j  
        // i will start with 0 and keep on incrementing till 10  
        // j will start with 10 and keep on decrementing till 0  
        for (int i = 0, j = 10; i < 10 && j > 0; i++, j--) {  
            System.out.println("i = " + i + " :: " + "j = " + j);  
        }  
    } // i and j cannot be used outside the loop  
}
```

# While Loop

```
class Main {  
    public static void main(String[] args) {  
        int i = 0;  
        while(i < 10) {  
            System.out.println("Hello World");  
            i++;  
        }  
    }  
}
```

while loop

## While Loop





```
public static void printAlternateNumbers() {  
    for(int i = 0; i <= 100; i = i + 2) {  
        System.out.println(i);  
    }  
  
    //-----  
  
    int i = 1;  
    while(i <= 100) {  
        System.out.println(i);  
        i = i + 1;  
    }  
}
```

# do while

```
class Main {  
    public static void main(String[] args) {  
        int i = 0;  
        do {  
            System.out.println("Hello World");  
            i++;  
        } while(i < 10);  
    }  
}
```

do while

## Do - While Loop

