

iteration = 1 time through the body of the loop

++ = increment operator

Day 5: Introduction to For Loops

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A **for loop** is a code construct that allows you to tell the computer to perform a set of tasks many times in a row. For loops are controlled by a **loop control variable** (LCV). Syntax:

Listing 1: For Loop Syntax

```
1 for( initialization; condition; increment ) {  
2     /*  
3     * body of loop  
4     */  
5 }
```

for(int i = 1; i < 3; i++) {
 System.out.println("Ali")
}

The **initialization** happens once, before the first **iteration** of the loop. The **condition** is checked before each iteration, and the body of the loop is only performed if the condition is true. The **increment** is performed after each iteration.

Here's a loop that creates and displays five randomly-generated integers:

Listing 2: Create Five Integers

```
1 int roll;  
2  
3 for( int i = 0; i < 5; i++ ) {  
4     roll = ( int ) ( Math.random( ) * 6 + 1 );  
5     System.out.println( "You rolled " + roll );  
6 }
```

The LCV in this example is the variable `i`; this is a common choice. Notice that this variable is declared within the loop's *scope*, not the method's scope. It is a syntax error to refer to `i` after the bottom of the loop. If you need to do so, declare `i` before the loop begins.

What does the code in Listing 2 do? It is often helpful to use a table to help answer this question:

★ in the body of the loop is where we put the repeated action

loop control variable
Step 1
Step 2
Step 3
Step 4
Test condition again

i	roll	Output

An **infinite loop** is one in which the condition never becomes false. This is a common bug.

Loops are often used to keep a *running total*. This example creates five random integers, and determines their sum:

Listing 3: Add Five Integers

```

1 int sum = 0;
2 int roll;
3 for( int i = 0; i < 5; i++ ) {
4     roll = ( int )( Math.random( ) * 6 + 1 );
5     sum = sum + roll;
6 }
7 System.out.println( "The sum is " + sum );

```