9. Looping Statements

Java

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Outline

- The while Statement
- The do-while Statement
- The for Statement
- References

The while Statement

The while Statement

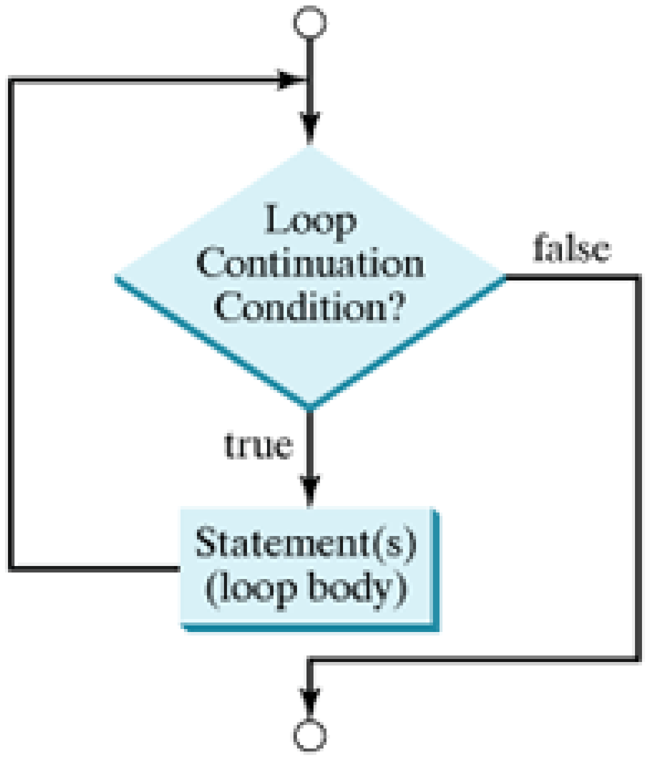
- The while statement continually executes a block of statements while a particular condition is True.
- The while statement has this general form:

```
while (expression)
{
      statement (s)
}
```

- The while statement evaluates expression, which must return a boolean value.
- If the expression evaluates to true, the while statement executes the statement(s) in the while block.

The while Statement

- The while loop:



The while Statement

- Example:
  - Using the while statement to print the values from 1 through 10.
  - WhileDemo.java

The while Statement

- You can implement an infinite loop using the while statement as follows:

```
while (true)
{
        // your code goes here
}
```

The do-while Statement

The do-while Statements

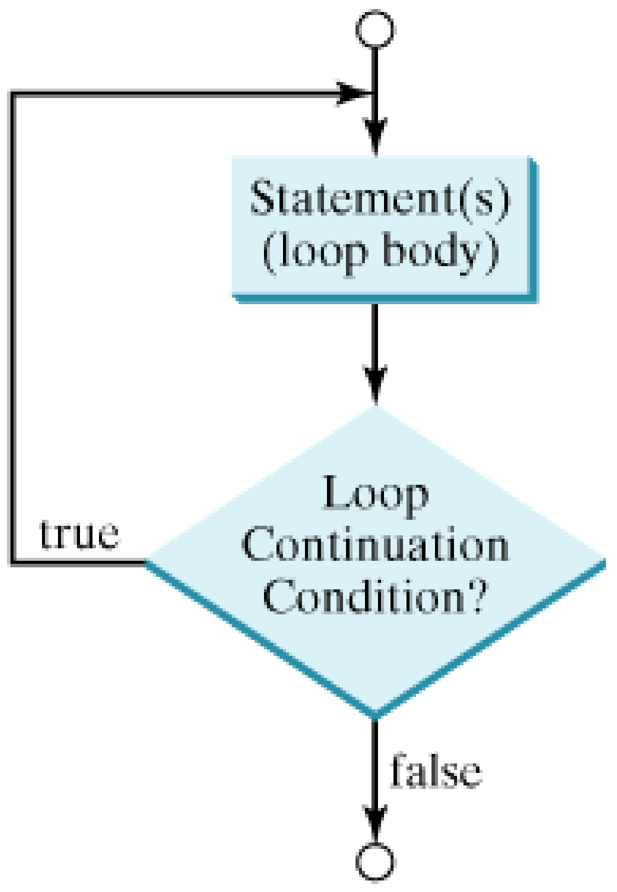
- The do-while statement can be expressed as follows:

```
do
{
   statement (s)
} while (expression);
```

- The difference between do-while and while
  - do-while evaluates its expression at the bottom of the loop instead of the top.
  - Therefore, the statements within the do block are always executed at least once.

The do-while Statements

- The do-while loop:



The do-while Statements

- Example:
  - Using the do-while statement to print the values from 1 through 10.
  - DoWhileDemo.java

The for Statement

The for Statement

- The for statement provides a compact way to iterate over a range of values.
- Programmers often refer to it as the "for loop"
- The general form of the for statement can be expressed as follows:

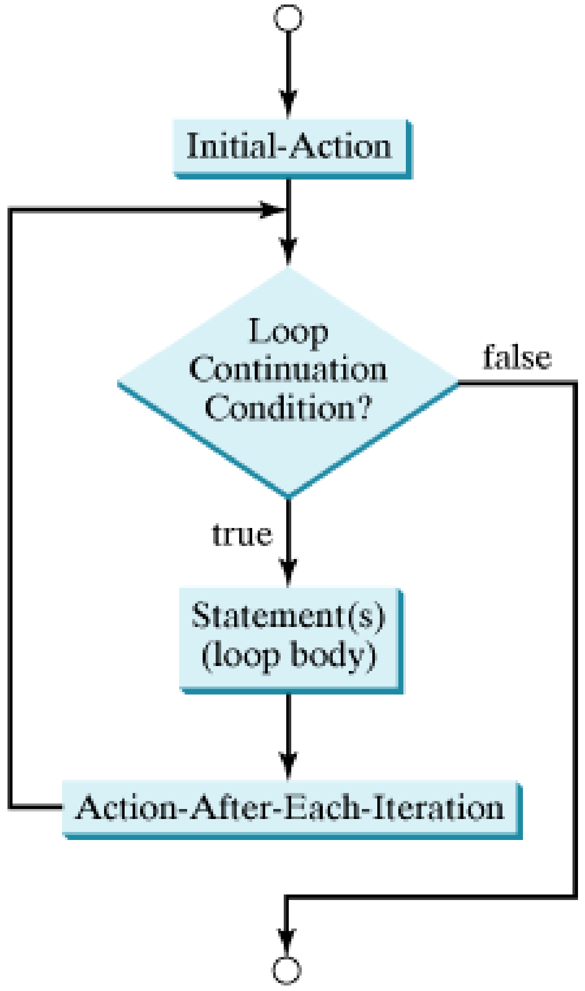
```
for (initialization; termination; increment)
{
    statement(s)
}
```

The for Statement

- When using this version of the for statement:
  - The **initialization** expression initializes the loop; it's executed once, as the loop begins.
  - When the **termination** expression evaluates to false, the loop terminates.
  - The **increment** expression is invoked after each iteration through the loop; it is perfectly acceptable for this expression to increment or decrement a value.

The for Statement

- A for loop:



The for Statement

- The following program uses the general form of the for statement to print the numbers 1 through 10.
  - ForDemo.Java

Initialization

- Notice how the code declares a variable within the initialization expression.
- The scope of this variable extends from its declaration to the end of the block governed by the for statement.
- If the variable that controls a for statement is not needed outside of the loop, it's best to declare the variable in the initialization expression.
- The names i, j, and k are often used to control for loops

The for Statement

- The three expressions of the for loop are optional; an infinite loop can be created as follows:

```
for (  ;  ;  )  {   // infinite loop
    // your code goes here
}
```

References

References

- S. Zakhour, S. Hommel, J. Royal, I. Rabinovitch, T. Risser, M. Hoeber, **The Java Tutorial: A Short Course on the Basics**, 4th Edition, Prentice Hall, 2006. (Chapter 3)

The End