Section-3

Operators

Eng. Abdirisak Abdalla
Department of computer science

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Operators in Java

- Operator is a symbol which tells to the compiler to perform some operation.
- Java provides a rich set of operators to deal with various types of operations.
- Sometimes we need to perform arithmetic operations then we use plus (+) operator for addition, multiply(*) for multiplication etc.

Java operators can be divided into following categories:

- Arithmetic operators
- Relation operators
- Logical operators
- Bitwise operators
- Assignment operators
- Conditional operators

Arithmetic operators

- Arithmetic operators are used to perform arithmetic operations like: addition, subtraction etc and helpful to solve mathematical expressions.

Con..

Operator	Description
+	adds two operands
-	subtract second operands from first
*	multiply two operand
/	divide numerator by denumerator
%	remainder of division
++	Increment operator increases integer value by one
--	Decrement operator decreases integer value by one

Java Arithmetic Operator Example: Expression

```
public class OperatorExample{
public static void main(String args[]){
System.out.println(10*10/5+(3-1)*4/2);
}}
```

Relation operators

- Relational operators are used to test comparison between operands or values.
- It can be use to test whether two values are equal or not equal or less than or greater than etc.

Con..

Operator	Description
==	Check if two operand are equal
!=	Check if two operand are not equal.
>	Check if operand on the left is greater than operand on the right
<	Check operand on the left is smaller than right operand
>=	check left operand is greater than or equal to right operand
<=	Check if operand on left is smaller than or equal to right operand

Logical operators

- Logical Operators are used to check conditional expression.
- For example, we can use logical operators in if statement to evaluate conditional based expression. We can use them into loop as well to evaluate a condition.
- Java supports following 3 logical operator.
- Suppose we have two variables whose values are: **a=true** and **b=false**.

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Operator	Description	Example
&&	Logical AND	(a && b) is false
||	Logical OR	(a || b) is true
!	Logical NOT	(!a) is false

Bitwise operators

- Bitwise operators are used to perform operations bit by bit.
- Java defines several bitwise operators that can be applied to the integer types long, int, short, char and byte.

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Operator	Description
&	Bitwise AND
|	Bitwise OR
^	Bitwise exclusive OR
<<	left shift
>>	right shift

Truth table for bitwise &, | and ^

a	b	a & b	a | b	a ^ b
0	0	0	0	0
0	1	0	1	1
1	0	0	1	1
1	1	1	1	0

Con..

- The bitwise **shift operators shifts the bit value**. The **left operand specifies the value to be shifted** and the **right operand specifies the number of positions** that the bits in the value are to be shifted. Both operands have the same precedence.
- **Example:** Lets create an example that shows working of bitwise operators.
- a = 0001000
- b = 2
- a << b = 0100000
- a >> b = 0000010

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Assignment Operators

- Assignment operators are used to assign a value to a variable.
- It can also be used combine with arithmetic operators to perform arithmetic operations and then assign the result to the variable.

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Operator	Description	Example
=	assigns values from right side operands to left side operand	a = b
+=	adds right operand to the left operand and assign the result to left	a+=b is same as a=a+b
-=	subtracts right operand from the left operand and assign the result to left operand	a-=b is same as a=a-b

Con..

Operator	Description	Example
*=	mutiply left operand with the right operand and assign the result to left operand	a*=b is same as a=a*b
/=	divides left operand with the right operand and assign the result to left operand	a/=b is same as a=a/b
%=	calculate modulus using two operands and assign the result to left operand	a%=b is same as a=a%b

Conditional operator

- It is also known as ternary operator because it works with **three operands.**
- **It is short alternate of if-else statement.**
- It can be used to evaluate Boolean expression and **return either true or false** value.
- In ternary operator, if **epr1** is true then expression evaluates after **question mark (?)** else evaluates **after colon (:)**.
- Syntax:
- epr1 ? expr2 : expr3

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Any Question?

Thank You