*Operators*

1. What are operators?
2. What is the use of operator?
3. Explain about operator with example?
4. What is an operand?
5. What is an expression (or) arithmetic expression?
6. What are the different types of operators in java programming language?
7. What is the use of arithmetic operators?
8. Write the list of arithmetic operators which is supported by java programming language?
9. Explain about arithmetic operator by using example?
10. What is the use of relational operators?
11. Write the list of relational operators?
12. Explain about relational operator by using example?
13. What is the use of bitwise operators?
14. Write the list of bitwise operators which are supported by java programming language?
15. Explain about bitwise operator by using example?
16. What is the use of assignment operators?
17. Is the assignment operator can perform assigning the values to the operands by combination of any other operators?
18. Write the list of assignment operators which are supported by java programming language with examples?
19. What is the use of logical operators?
20. Write the list of logical operators which are supported by java programming language?
21. Explain about logical operators by using the example?
22. Write the list of Misc Operators which are supported by java programming language with examples?
23. Explain about “?:” Operator with example?
24. Explain about short notes on L-VALUE and R-VALUE?
25. Explain about Operators Categories?
26. What is the precedence of Operators?
27. Explain about precedence of operator by using example?
28. In any expression what operator evaluated first?
29. Write the list of precedence of Operators?

*Operators*

1. **What are operators?**

* Operators are special symbols.

1. **What is the use of operator?**

* Operators are used for to perform an operation on operands.
* Operators are used to manipulate the data and variables in the programs.

1. **Explain about operator with example?**

* For a simple example 4 *+ 5 = 9*.
* Here 4 and 5 are called operands and “+”is called operator.

1. **What is an operand?**

* The data over which the manipulation is performed by operators is called an operand.

1. **What is an expression (or) arithmetic expression?**

* An expression is a combination of operators and operands where an operand can be a constant.

1. **What are the different types of operators in java programming language?**

* There are six different types of operators in java programming language they are:
* Arithmetic Operators
* Relational Operators
* Bitwise Operators
* Logical Operators
* Assignment Operators and
* Misc Operators

1. **What is the use of arithmetic operators?**

* The arithmetic operators are used to perform arithmetical operations on operands.

1. **Write the list of arithmetic operators which is supported by java programming language?**

* The list of arithmetic operators which are supported by java programming language are

Addition(+), Subtraction(-), Multiplication(\*), Division(/), Module(%), Increment(++) and decrement( --).

1. **Explain about arithmetic operator by using example?**

* Let assume that variable A holds 10 and variable B holds 20 then:

|  |  |  |
| --- | --- | --- |
| **Operator** | **Description** | **Example** |
| + | Adds two operands | A + B will give 30 |
| - | Subtracts second operand from the first | A - B will give -10 |
| \* | Multiply both operands | A \* B will give 200 |
| / | Divide numerator by denominator | B / A will give 2 |
| % | Modulus Operator and remainder of after an integer division | B % A will give 0 |
| ++ | Increment operator, increases integer value by one | A++ will give 11 |
| -- | Decrement operator, decreases integer value by one | A-- will give 9 |

1. **What is the use of relational operators?**

* The relational operators are used to perform relational operations on the operands.

1. **Write the list of relational operators?**

* The relational operators which are supported by java programming language are

Equal to (==), Not equal (! =), Less than (<), Greater than (>), Less than or equal to(<=), and Greater than or equal to (>=) .

1. **Explain about relational operator by using example?**

* Let assume that variable A holds 10 and variable B holds 20 then:

|  |  |  |
| --- | --- | --- |
| **Operator** | **Description** | **Example** |
| == | Checks if the value of two operands is equal or not, if yes then condition becomes true. | (A == B) is not true. |
| != | Checks if the value of two operands is equal or not, if values are not equal then condition becomes true. | (A != B) is true. |
| > | Checks if the value of left operand is greater than the value of right operand, if yes then condition becomes true. | (A > B) is not true. |
| < | Checks if the value of left operand is less than the value of right operand, if yes then condition becomes true. | (A < B) is true. |
| >= | Checks if the value of left operand is greater than or equal to the value of right operand, if yes then condition becomes true. | (A >= B) is not true. |
| <= | Checks if the value of left operand is less than or equal to the value of right operand, if yes then condition becomes true. | (A <= B) is true. |

1. **What is the use of bitwise operators?**

* Bitwise operators are used to perform bit by bit operation on the operands.

1. **Write the list of bitwise operators which are supported by java programming language?**

* The bitwise operators which are supported by java programming language are shown in the following table.

|  |  |  |
| --- | --- | --- |
| **Operator** | **Description** | **Example** |
| & | In binary AND operator the bit is copied into the result when the bit is exists in both operands. | (A & B) will give 12 which is 0000 1100 |
| | | In binary OR operator the bit is copied into the result when the bit is exists in any one of the operand. | (A | B) will give 61 which is 0011 1101 |
| ^ | In binary XOR operator the bit is copied into the result when the bit is exists in one operand but not both. | (A ^ B) will give 49 which is 0011 0001 |
| ~ | In binary ones complement operator is unary operator and it is used for copied the by changing the bits. | (~A ) will give -60 which is 1100 0011 |
| << | In binary left shift operator the left operands value is moved left by the number of bits specified by the right operand. | A << 2 will give 240 which is 1111 0000 |
| >> | In binary right shift operator the left operands value is moved right by the number of bits specified by the right operand. | A >> 2 will give 15 which is 0000 1111 |

1. **Explain about bitwise operator by using example?**

* Let assume that if A = 60; and B = 13; Now in binary format they will be as follows:

A = 0011 1100

B = 0000 1101

-----------------

A&B = 0000 1100

A|B = 0011 1101

A^B = 0011 0001

~A = 1100 0011

1. **What is the use of assignment operators?**

* The assignment operators are used to perform assigning the values to the operands.

1. **Is the assignment operator can perform assigning the values to the operands by combination of any other operators?**

* Yes, the assignment operator are performing assign the values to the operands with the combination arithmetic and bitwise operators.

1. **Write the list of assignment operators which are supported by java programming language with examples?**

* The assignment operators which are supported by java programming language are shown in the following table.

|  |  |  |
| --- | --- | --- |
| **Operator** | **Description** | **Example** |
| = | Simple assignment operator, Assigns values from right side operands to left side operand | C = A + B will assigne value of A + B into C |
| += | Add AND assignment operator, It adds right operand to the left operand and assign the result to left operand | C += A is equivalent to C = C + A |
| -= | Subtract AND assignment operator, It subtracts right operand from the left operand and assign the result to left operand | C -= A is equivalent to C = C - A |
| \*= | Multiply AND assignment operator, It multiplies right operand with the left operand and assign the result to left operand | C \*= A is equivalent to C = C \* A |
| /= | Divide AND assignment operator, It divides left operand with the right operand and assign the result to left operand | C /= A is equivalent to C = C / A |
| %= | Modulus AND assignment operator, It takes modulus using two operands and assign the result to left operand | C %= A is equivalent to C = C % A |
| <<= | Left shift AND assignment operator | C <<= 2 is same as C = C << 2 |
| >>= | Right shift AND assignment operator | C >>= 2 is same as C = C >> 2 |
| &= | Bitwise AND assignment operator | C &= 2 is same as C = C & 2 |
| ^= | bitwise exclusive OR and assignment operator | C ^= 2 is same as C = C ^ 2 |
| |= | bitwise inclusive OR and assignment operator | C |= 2 is same as C = C | 2 |

1. **What is the use of logical operators?**

* The logical operators are used for to perform logical operations on the operands.

1. **Write the list of logical operators which are supported by java programming language?**

* The logical operators which are supported by java programming language are
* Logical AND(&&),
* Logical OR(||) and
* Logical NOT (!)

1. **Explain about logical operators by using the example?**

* Let assume that boolean variables A holds true and variable B holds false, then

|  |  |  |
| --- | --- | --- |
| Operator | Description | Example |
| && | In logical AND operator. If both the operands are non-zero then condition becomes true. | (A && B) is true. |
| || | In logical OR Operator. If any of the two operands is non-zero then condition becomes true. | (A || B) is true. |
| ! | In logical NOT Operator. Use to reverses the logical state of its operand. If a condition is true then Logical NOT operator will make false. | !(A && B) is false. |

1. **Write the list of Misc Operators which are supported by java programming language with examples?**

* The Misc operators which are supported by java programming language are shown in the following table.

|  |  |  |
| --- | --- | --- |
| **Operator** | **Description** | **Example** |
| sizeof() | Returns the size of a variable. | sizeof(a), where a is integer, will return 4. |
| & | Returns the address of a variable. | &a; will give actual address of the variable. |
| ? : | Conditional Expression | If Condition is true? Then value X : Otherwise value Y |

1. **Explain about “?:” Operator with example?**

* The“?:” operator is similar to “if ... else” statement but except that this is an operator.
* It is used only within the expressions.
* “?:” operator is a ternary operator because it takes three values.

**Example:**

|  |
| --- |
| If condition is true? then return X value : otherwise Y value; |

1. **Explain about short notes on L-VALUE and R-VALUE?**

* Let Assume that x = 1;
* Here the value on the right side is assigned to the memory which is referenced by x.
* Here x is called as L-VALUES and 1 is called as R-VALUES.
* L-values can be appears on any side of the assignment operator but R-values can be only appears on the right side of the assignment operator.
* Because of this y = x; is valid but 1 = x; is invalid.

1. **Explain about Operators Categories?**

* In java programming language, All the operators are categorized into the following categories they are
* Postfix operators:
* Postfix operators are those which are followed by a single operand.
* Unary prefix operators:
* Unary prefix operators are those which are preceded by a single operand.
* Binary operators:
* Binary operators are those which take two operands and perform a variety of arithmetic and logical operations.
* The conditional operators:
* It is also called as a ternary operator
* Conditional operators are that which takes three operands and evaluates either the second or third expression, depending on the evaluation of the first expression.
* Assignment operators:
* Assignment operators are those which are used to assign a value to the variable.
* The comma operators:
* The comma operators are those which are guarantees left-to-right evaluation expressions that are separated by comma operator.

1. **What is the precedence of Operators?**

* The precedence of operators are determines the grouping of terms in an expression.
* These are used for finding how an expression is evaluated.
* And these are used for identifying the precedence’s of operators.

1. **Explain about precedence of operator by using example?**

* For example, the multiplication operator has higher precedence than the addition operator.

**Example:**

x = 7 + 3 \* 2;

* Here x value is 13 not 20.
* Because the multiplication (\*) operator has higher precedence than addition (+) operator.
* So here the first multiplication can be done 3\*2 and then addition operation can be performed.

1. **In any expression what operator evaluated first?**

* In any expression, the higher precedence operator can be evaluated first.

1. **Write the list of precedence of Operators?**

* The list of precedence of operators are shows in the below table

|  |  |  |
| --- | --- | --- |
| **Category** | **Operator** | **Associativity** |
| Postfix | () ,[], ., ++, - - | Left to right |
| Unary | +, -, !, ~, ++, - -, (type),&, size of | Right to left |
| Multiplicative | \*, /, % | Left to right |
| Additive | +, - | Left to right |
| Shift | <<,>> | Left to right |
| Relational | <<=,>>= | Left to right |
| Equality | ==, !=, | Left to right |
| Bitwise AND | & | Left to right |
| Bitwise XOR | ^ | Left to right |
| Bitwise OR | | | Left to right |
| Logical AND | && | Left to right |
| Logical OR | || | Left to right |
| Conditional | ?: | Right to left |
| Assignment | =, +=, -=, \*=, /=, %=,>>=,<<=,&=, ^=, |= | Right to left |
| Comma | , | Left to right |