# C Language

## Chapter # 9

## Elements of C language

## Lecture: 12

# Today's Lecture

- What are operators?
- What is Expression?
- Different types of operators in C language.

# Operators

- Operators are the symbols that are used to perform certain operations on data.

C provides variety of operators.

1. Arithmetic operators
2. Relational operators
3. Logical operators
4. Assignment operator
5. Increment and Decrement operators
6. Compound Assignment operators

# Expression

- A statement that evaluates to a value is called an expression.
- An expression gives a single value.
- An expression consist of operators and operands.

For example:

2 + 3  m/n  x+100

# 1. Arithmetic operators

- Arithmetic operator is a symbol that performs mathematical operations on data.

| Arithmetic Operators | Operation | Example |
|---|---|---|
| + | Addition | 10 + 2 = 12 |
| – | Subtraction | 10 – 2 = 8 |
| * | Multiplication | 10 * 2 = 20 |
| / | Division | 10 / 2 = 5 |
| % | Modulus – It returns the remainder after the division | 10 % 2 = 0 (Here remainder is zero). If it is 10 % 3 then it will be 1. |

- **Some important points about modulus operator.**

1. Modulus operator is also called remainder operator.
2. The modulus operator works only with integer values.
3. If modulus operator is used with the division of 0, the result is always be 0, For example the expression 0 % 5 will give 0 as result.
4. In expression 3 % 5, 3 is not divisible by 5. its result is 3.

# 2. Relational operators

- Relational operators are used to specify conditions in programs. A relational operator compares two values. It produces result as true or false.

| **Relational Operators** | **Operation** | **Example** |
|---|---|---|
| > | Greater than | 4 > 9 (False) |
| < | Les than | 3 < 4 (True) |
| == | Equal to | 7 == 2 (False) |
| >= | Greater than or equal to | 7 >= 7 (True) |
| <= | Less than or equal to | 8 <= 10 (True) |
| != | Not equal to | 9 != 9 (False) |

# 3. Logical operators

- Logical operators are used to evaluate compound conditions in programs.

| Logical Operators | Operation | Example |
|---|---|---|
| && | AND | 4 > 9 && 7 > 3 (False) |
| \|\| | OR | 3 > 8 \|\| 8 > 4 (True) |
| ! | NOT | 7 == 2 (False) !(7 == 2) (True) |

# 4. Assignment operator

- Assignment operator is used to assign a value or computational result to a variable.

| Assignment Operator | Operation | Example |
|---|---|---|
| = | Assignment | a = 20;<br>s = a + b;<br>x = c – d + 100; |

# Assignment Statement

- A statement that assigns a value to a variable is known as assignment statement.

For example:

```
a = 20;
s = a + b;
x = c – d + 100;
```

# Compound Assignment Statement

- An assignment statement that assigns a value to many variable is known as compound assignment statement.

For example:

```
a = b = 20;
x = y = z = 70;
m = n = 100;
```

# Lvalue and Rvalue

- An Lvalue is an operand that can be written on the left side of assignment operator. It must always be a single value.
- An Rvalue is an operand that can be written on the right side of assignment operator.
- All values can be used as Rvalues but all values cannot be used as Lvalues.

  For example:

  A constant can be used as Rvalue but cannot be used as Lvalue.

  The expression  x = 5 is valid but the expression 5 = x is not valid.

# Data Type of expression

- The data type of an expression depends on the types of operands. For example the result of an expression in int, if both operands are integers.
- An expression in which operands are of different data types is called mixed-type expression. In this case the result of an expression is evaluated to large data type in the expression.

| Expression | Data type of Expression |
|---|---|
| int + float | float |
| int – long | long |
| int * double | double |
| float / long double | long double |

# The End

**Read this topic from your books and ask question if any confusion.**

# JAZAKALLAH