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**Structure of Computers
and Applications
1st year ST – ENGINEERING**

➔ **Part 2: The basics of Algorithm and Program**

Course 07: C OPERATORS

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13_ C OPERATORS

□ Operator:

- An operator is a Symbol that **performs** an operation. An operators acts some variables are called **operands** to get the desired **result**.
- An operator is a symbol that is used to perform mathematical or logical manipulations in the program.
- C language has the following operators:
 - ✓ 1. **Arithmetic operators**
 - ✓ 2. **Relational operators**
 - ✓ 3. **Logical operators**
 - ✓ 4. **Assignment operators**
 - ✓ 5. **Increment or decrement operators**

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□ Arithmetic operators:

- These are used to perform **basic mathematical** calculations like addition, subtraction, multiplication, division and modulus operations in

Operators	Meaning	Example	Result
+	Addition	$4 + 2$	6
-	Subtraction	$4 - 2$	2
*	Multiplication	$4 * 2$	8
/	Division	$4 / 2$	2
%	Modulus operator to get remainder in integer division	$5 \% 2$	1

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□ Relational operator:

- A relational operator checks the **relationship** between two **operands**.
- If the relation is **true**, it returns **1**; if the relation is false, it returns **value 0**. Operands may be **variables**, constants or **expressions**.
- Relational operators are used in **decision making** and **loops**.

Operator	Meaning	Example	Return value
<	is less than	2<9	1
<=	is less than or equal to	2 <= 2	1
>	is greater than	2 > 9	0
>=	is greater than or equal to	3 >= 2	1
==	is equal to	2 == 3	0
!=	is not equal to	2!=2	0

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□ Logical operators

- These operators are used to combine the results of two or more conditions.
- An expression containing logical operator returns either **0** or **1** depending upon whether expression results **true** or **false**.

Operator	Description	Example
&&	Logical AND	If c=5 and d=2 then, ((c==5) && (d>5)) returns false.
 	Logical OR	If c=5 and d=2 then, ((c==5) (d>5)) returns true.
!	Logical NOT	If c=5 then, !(c==5) returns false.

➤ Logical AND :

Truth Table

Op1	Op2	Op1 && Op2
true	true	true
true	false	false
false	true	false
false	false	false

Logical OR :

Truth Table

Op1	Op2	Op1 // Op2
true	true	true
true	false	true
false	true	true
false	false	false

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□ Assignment operators:

➤ This operator is used to assign the values for the variables in the programs.

Operator	Description	Example
=	Simple assignment	$A=B$; i.e. B value is assigned to A
+=	Addition and assignment	$A+=B$ is same as $A=A+B$
-=	Subtraction and assignment	$A-=B$ is same as $A=A-B$
=	Multiplication and assignment	$A=B$ is same as $A=A*B$
/=	Division and assignment	$A/=B$ is same as $A=A/B$
%=	Modulus and assignment	$A%=B$ is same as $A=A\%B$

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□ Increment or decrement operators:

➤ These operators are used to increment or decrement by 1 in an expression.

Operator	Description	Example
++operand	Unary pre-increment	A=++10; first evaluates 11 and assigns A=11
--operand	Unary pre-decrement	A=--10; first evaluates 9 and assigns A=9
operand++	Unary post-increment	A=10++; first assigns A=10 then increments A by 1
operand--	Unary post-decrement	A=10--;first assigns A=10 then decrements A by 1

Note:

We cannot use increment (Decrement) operator on the **constant values** because increment (Decrement) operator operates on only variables.