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FACULTY OF ENGINEERING & TECHNOLOGY

CSPS103: Object Oriented Programming

Lecture-05

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OBJECTIVES

In this lecture, you will learn to:

- ❖Operators
- ❖Arithmetical operators
- ❖Relational operators
- ❖Logical operators
- ❖Assignment operators
- ❖Conditional operators
- ❖Comma operator

OPERATORS

- An operator is a symbol that tells the compiler to perform specific mathematical or logical manipulations.
- C++ is rich in built-in operators.
- Generally, there are seven type of operators:

1. Arithmetical operators
2. Relational operators
3. Logical operators
4. Assignment operators
5. Conditional operators
6. Comma operator
7. Sizeof operators

ARITHMETICAL OPERATORS

Arithmetical operators +, -, *, /, and % are used to performs an arithmetic (numeric) operation

Operator	Meaning
+	Addition
-	Subtraction
*	Multiplication
/	Division
%	Modulus

- You can use the operators +, -, *, and / with both integral and floating-point data types.
- Modulus or remainder % operator is used only with the integral data type.

RELATIONAL OPERATORS

- The relational operators are used to test the relation between two values.
- All relational operators are binary operators and therefore require two operands.
- A relational expression returns zero when the relation is false and a non-zero when it is true.
- The following table shows the relational operators.

Relational Operators	Meaning
<	Less than
<=	Less than or equal to
==	Equal to
>	Greater than
>=	Greater than or equal to
!=	Not equal to

LOGICAL OPERATORS

- The logical operators are used to combine one or more relational expression.
- The logical operators are

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

ASSIGNMENT OPERATOR

- The assignment operator '=' is used for assigning a variable to a value.

- This operator takes the expression on its right-hand-side and places it into the variable on its left-hand-side.

For example:
m = 5;

- The operator takes the expression on the right, 5, and stores it in the variable on the left, m.

x = y = z = 32;

This code stores the value 32 in each of the three variables x, y, and z. In addition to standard assignment operator shown above, C++ also support compound assignment operators.

Compound Assignment Operators

Operator	Example	Equivalent to
+=	A += 2	A = A + 2
-=	A -= 2	A = A – 2
%=	A %= 2	A = A % 2
/=	A/= 2	A = A / 2
*=	A *= 2	A = A * 2

INCREMENT AND DECREMENT OPERATORS

❑ C++ provides two special operators viz '++' and '--' for incrementing and decrementing the value of a variable by 1.

❑The increment/decrement operator can be used with any type of variable but it cannot be used with any constant.

❑Increment and decrement operators each have two forms, pre and post.

The syntax of the increment operator is:

Pre-increment: ++variable
Post-increment: variable++

The syntax of the decrement operator is:

Pre-decrement: —variable
Post-decrement: variable—

❑In Prefix form first variable is first incremented/decremented, then evaluated

❑In Postfix form first variable is first evaluated, then incremented / decremented.

CONDITIONAL OPERATOR

- The conditional operator ?: is called ternary operator as it requires three operands.
- The format of the conditional operator is :

```
Conditional_ expression ? expression1 : expression2;
```


Example

If the value of conditional expression is true then the expression1 is evaluated, otherwise expression2 is evaluated.

```
int a = 5, b = 6;
big = (a > b) ? a : b;
```

The condition evaluates to false, therefore big gets the value from b and it becomes 6.

THE COMMA OPERATOR

- The comma operator gives left to right evaluation of expressions.
- When the set of expressions has to be evaluated for a value, only the rightmost expression is considered.

```
int a = 1, b = 2, c = 3, i; // comma acts as separator, not as an operator

i = (a, b); // stores b into i would first assign the value of a to i, and then assign value of b to variable i.
```

- So, at the end, variable i would contain the value 2.

THE SIZEOF OPERATOR

The sizeof operator can be used to find how many bytes are required for an object to store in memory.

For example

sizeof (char) returns 1

sizeof (float) returns 4

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Multiple Choice Question:

Q1. What is this operator called ?:?

a) conditional

b) relational

c) casting operator

d) unrelational

Multiple Choice Question:

Q2. Which operator is having the right to left associativity in the following?

a) Array subscripting

b) Function call

c) Addition and subtraction

d) Type cast

Multiple Choice Question:

Q3. Which operator is having the highest precedence?

a) postfix

b) unary

c) shift

d) equality

Multiple Choice Question:

Q4. What will be the output of the following C++ code?

```
#include <iostream>
using namespace std;
int main()
{
    int a;
    a = 5 + 3 * 5;
    cout << a;
    return 0;
}
```

a) 35

b) 20

c) 25

d) 30

Multiple Choice Question:

Q5. How many types of comments are there in c++?

a) 1

b) 2

c) 3

d) 4

Summary

In this lecture, you learned that:

- Seven types of operators
  1. Arithmetical operators
  2. Relational operators
  3. Logical operators
  4. Assignment operators
  5. Conditional operators
  6. Comma operator
  7. Sizeof operators