

# CL1002 – Programming Fundamentals Lab



## Lab # 04

### Arithmetic Operators & Escape Sequences in C

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## Escape Sequences

Character combinations consisting of a backslash (\) followed by a letter or by a combination of digits are called "escape sequences." To represent a newline character, single quotation mark, or certain other characters in a character constant, you must use escape sequences. An escape sequence is regarded as a single character and is therefore valid as a character constant. Escape sequences are used to format our output. The following escape sequences can be used to print out special characters.

Escape Sequence	Description
<code>\n</code>	Newline
<code>\t</code>	Horizontal tab
<code>\v</code>	Vertical tab
<code>\\</code>	Backslash
<code>\"</code>	Double quote

To insert a line break, a new-line character shall be inserted at the exact position the line should be broken. In C, a new-line character can be specified as `\n` (i.e., a backslash character followed by a lowercase n).

### Example 1

```
#include <stdio.h>

int main() {
    printf("This is a line of text.\n"); // \n represents a newline
    printf("This is a new line of text.\n"); // \n creates a new line

    return 0;
}
```

## Example 2

Following program shows the use of Newline Escape Sequence (`\n`).

```
#include <stdio.h>

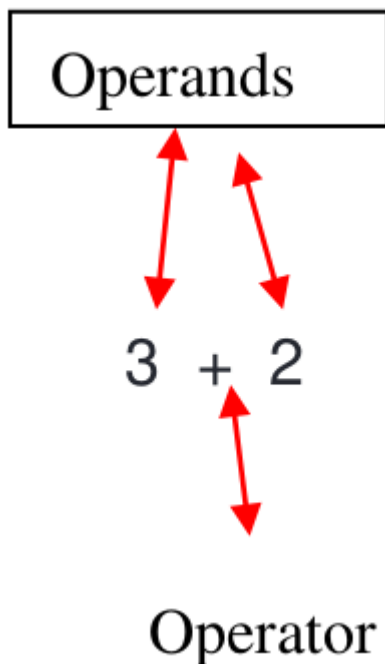
int main() {
    printf("Name:\tJohn Doe\n"); // \t represents a tab
    printf("Age:\t30\n"); // \t inserts a tab to align the columns

    return 0;
}
```

Now try escape sequences `\\`, `\v`, `\"` yourself.

## Operators

Operators are special symbols that carry out arithmetic or logical computation. The value that the operator operates on is called the operand.



Here, `+` is the operator that performs addition. 2 and 3 are the operands and 5 is the output of the operation.

```
int sum1 = 100 + 50;      // 150 (100 + 50)
int sum2 = sum1 + 250;    // 400 (150 + 250)
int sum3 = sum2 + sum2;    // 800 (400 + 400)
```

## Arithmetic Operators

Arithmetic operators are used to perform mathematical operations like addition, subtraction, multiplication etc.

Operator	Meaning	Example
+	Add two operands	$x + y$
-	Subtract right operand from the left	$x - y$
*	Multiply two operands	$x * y$
/	Divide left operand by the right one	$x / y$
%	Modulus - remainder of the division of left operand by the right	$x \% y$ (remainder of $x/y$ )

## Assignment & Assignment Arithmetic operators

Assignment operators are used to assign values to variables.

int a = 5 is a simple assignment operator that assigns the value 5 on the right to the variable as on the left.

Operator	Example	Equivalent to
=	x = 5	x = 5
+=	x += 5	x = x + 5
-=	x -= 5	x = x - 5
*=	x *= 5	x = x * 5
/=	x /= 5	x = x / 5
%=	x %= 5	x = x % 5

### Example 4

```
#include<stdio.h>
int main()
{
    int a=2;
    int b=3;
    int sum=a+b;
    int diff=a-b;
    int product=a*b;
    int division=a/b;
```

```
int mod=a%b;
printf("a = %d b = %d", a, b);
printf("\nSum: %d", sum);
printf("\nDiff: %d", diff);
printf("\nProduct: %d", product);
printf("\nDivision: %d", division);
printf("\nModulus: %d", mod);
return 0;
}
```

### Example 5

```
#include <stdio.h>

int main() {
    // Declare and initialize variables
    int a = 10;
    int b = 5;

    // Assignment arithmetic operators
    a += b; // Equivalent to a = a + b
    printf("a += b: %d\n", a);

    a -= b; // Equivalent to a = a - b
    printf("a -= b: %d\n", a);

    a *= b; // Equivalent to a = a * b
    printf("a *= b: %d\n", a);

    a /= b; // Equivalent to a = a / b
    printf("a /= b: %d\n", a);

    a %= b; // Equivalent to a = a % b
    printf("a %= b: %d\n", a);

    return 0;}
```

**Exercise:**

- 1. Practice the examples provided above for better understanding.**
- 2. Write a code in C, that generates the following output.**

Character 1: "Hello there!"

Character 2: 'Hi! How are you?'    Character 1: I'm good, thanks!

Character 2: That's great!'

- 3. Find the solution to the following quadratic equation. Read value of x from user.**

a.  $3x^2 - 7x + 2 = 0$