**Increment and Decrement operators**

[Pre-increment ( ++a ) and Post-increment ( a++ ) operators]

### ++A and A++ Operators in C++

Both ++A and A++ are **increment operators** used to increase the value of a variable by 1.  
However, there's a key difference in **when** the increment happens.

### Syntax and Meaning

| **Operator** | **Name** | **Description** |
| --- | --- | --- |
| ++A | Pre-increment | Increments the value **before** using it |
| A++ | Post-increment | Uses the value **before** incrementing it |

### Example:

#include <iostream>

using namespace std;

int main() {

int A = 5;

cout << "Initial A = " << A << endl;

cout << "Using ++A: " << ++A << endl; // A becomes 6, then prints 6

cout << "After ++A, A = " << A << endl;

cout << "Using A++: " << A++ << endl; // Prints 6, then A becomes 7

cout << "After A++, A = " << A << endl;

return 0;

}

### Output:

Initial A = 5

Using ++A: 6

After ++A, A = 6

Using A++: 6

After A++, A = 7

A= 5;

B= 10;

C = ++A + B--;

D = ++A + --B;

### goto Statement in C++

The goto statement is used to **transfer control** to a labeled part of the program. It should be used **sparingly**, as it can make code harder to read and maintain.

### **Syntax:**

goto label;

// ... some code ...

label:

// ... target code ...

### When to **avoid** goto:

* In structured programming, prefer **loops**, **functions**, and **conditionals** over goto
* Use only when absolutely necessary (e.g., exiting deeply nested loops or error handling in old C-style code)

**//Example: Skip a section using goto**

#include <iostream>

using namespace std;

int main() {

int x = 5;

if (x == 5) {

goto skip;

}

cout << "This line is skipped if x is 5." << endl;

skip:

cout << "This line is reached using goto." << endl;

return 0;

}

**// Example: Using goto in a loop to retry on invalid input**

#include <iostream>

using namespace std;

int main() {

int mark;

retry:

cout << "Enter a mark between 0 and 100: ";

cin >> mark;

if (mark < 0 || mark > 100) {

cout << "Invalid mark. Try again.\n";

goto retry; // jump back to input

}

cout << "You entered a valid mark: " << mark << endl;

return 0;

}

// **C++ program to calculate the factorial of a number using** goto **statement**

#include <iostream>

using namespace std;

int main() {

int n, i = 1;

unsigned long long fact = 1;

cout << "Enter a positive integer: ";

cin >> n;

if (n < 0) {

cout << "Factorial is not defined for negative numbers." << endl;

return 0;

}

start:

if (i <= n) {

fact = fact \* i;

i++;

goto start;

}

cout << "Factorial of " << n << " is: " << fact << endl;

return 0;

}