

Programming Fundamental

Lab#05

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Control Statements:

Sometimes we need to execute a block of statements only when a particular condition is met or not met. This is called **decision making**, as we are executing a certain code after making a decision in the program logic.

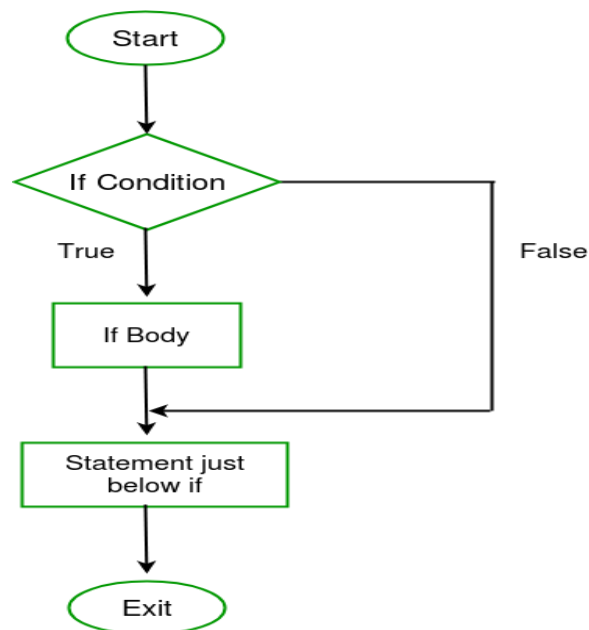
1. If Statement
2. If-else Statement
3. If-else if- else statement
4. Switch statement
5. Nested Statement

If statement in C++

If statement consists a condition, followed by statement or a set of statements as shown below:

```
if(condition){  
    Statement(s);  
}
```

The statements inside **if** parenthesis (usually referred as if body) gets executed only when the given condition is true. If the condition is false than the statements inside if body are completely ignored.



For example:

For example:

```
#include<iostream>
using namespace std;
int main()
{
    int x = 20;
    int y = 18;
    if (x > y)
    {
        cout << "x is greater than y";
    }

    system( "pause" );
    return 0;
}
```

Output:
???

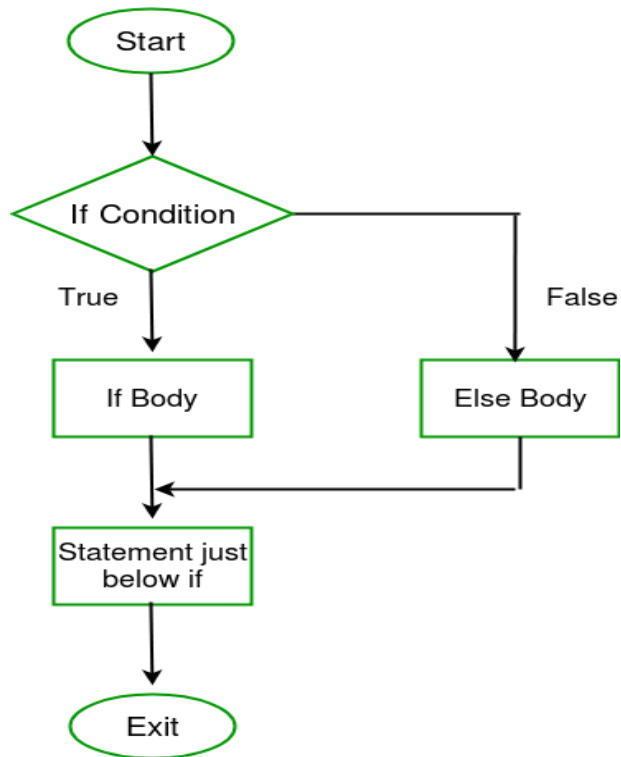
If else Statement in C++

Sometimes you have a condition and you want to execute a block of code if condition is true and execute another piece of code if the same condition is false. This can be achieved in C++ using if-else statement.

This is how an if-else statement looks:

```
if(condition) {
    Statement(s);
}
else {
    Statement(s);
}
```

The statements inside “if” would execute if the condition is true, and the statements inside “else” would execute if the condition is false.



For example:

```
#include<iostream>
using namespace std;
int main()
{
    int x = 15;
    int y = 18;
    if (x > y)
    {
        cout << "x is greater than y";
    }
    else
    {
        cout << "x is less than y";
    }

    system( "pause" );
    return 0;
}
```

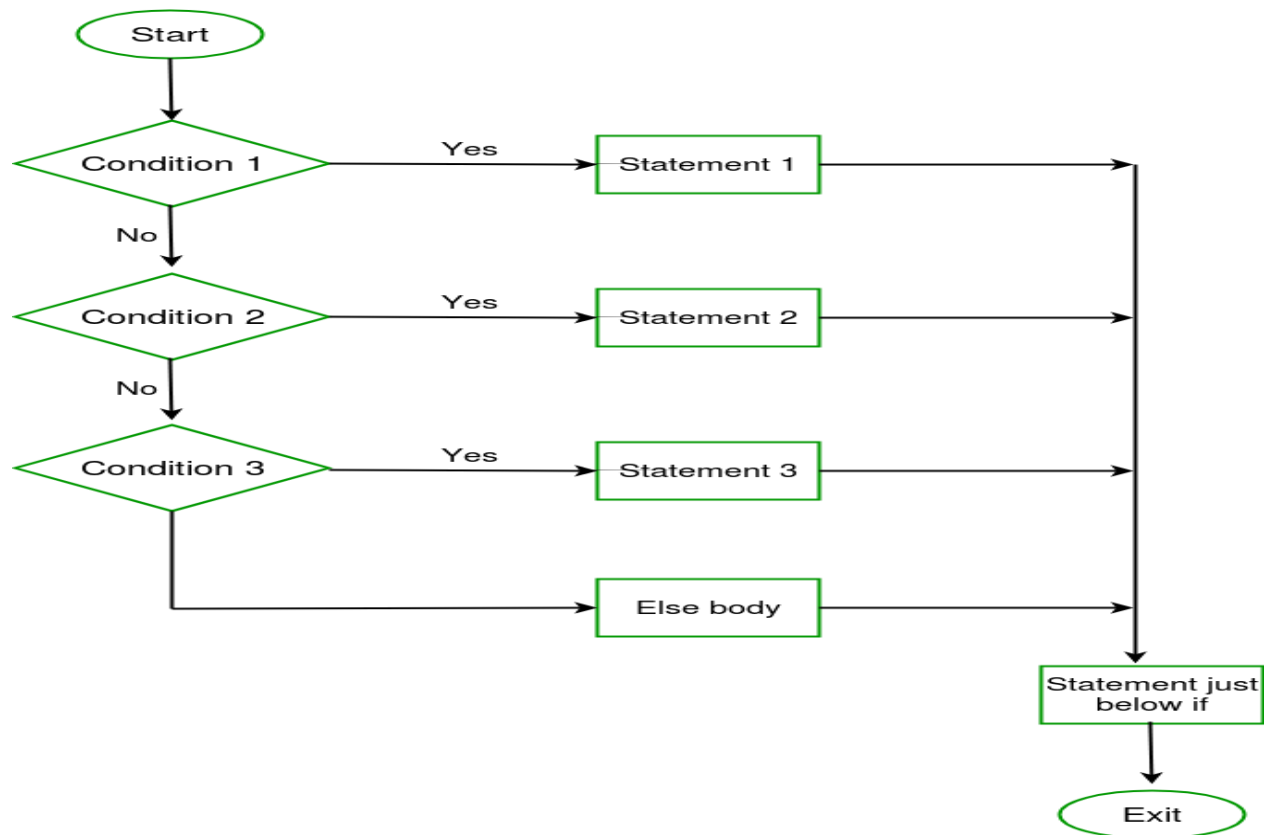
Output:
????

if-else-if else Statement in C++

if-else-if statement is used when we need to check multiple conditions. In this control structure we have only one “if” and one “else”, however we can have multiple “else if” blocks. This is how it looks:

```
if(condition_1) {
    /*if condition_1 is true execute this*/
    statement(s);
}
else if(condition_2) {
    /* execute this if condition_1 is not met and
    * condition_2 is met
    */
    statement(s);
}
else if(condition_3) {
    /* execute this if condition_1 & condition_2 are
    * not met and condition_3 is met
    */
    statement(s);
}
.
.
.
else {
    /* if none of the condition is true
    * then these statements gets executed
    */
    statement(s);
}
```

Note: The most important point to note here is that in if-else-if, as soon as the condition is met, the corresponding set of statements get executed, rest gets ignored. If none of the condition is met then the statements inside “else” gets executed.



```
#include<iostream>
using namespace std;
int main()
{
    int i = 20;

    if (i == 10)
    {
        cout<<"i is 10";
    }
    else if (i == 15)
    {
        cout<<"i is 15";
    }
    else if (i == 20)
    {
        cout<<"i is 20";
    }
    else
    {
        cout<<"i is not present";
    }

    system("pause");
}
```

```
    return 0;  
}
```

Output:

???

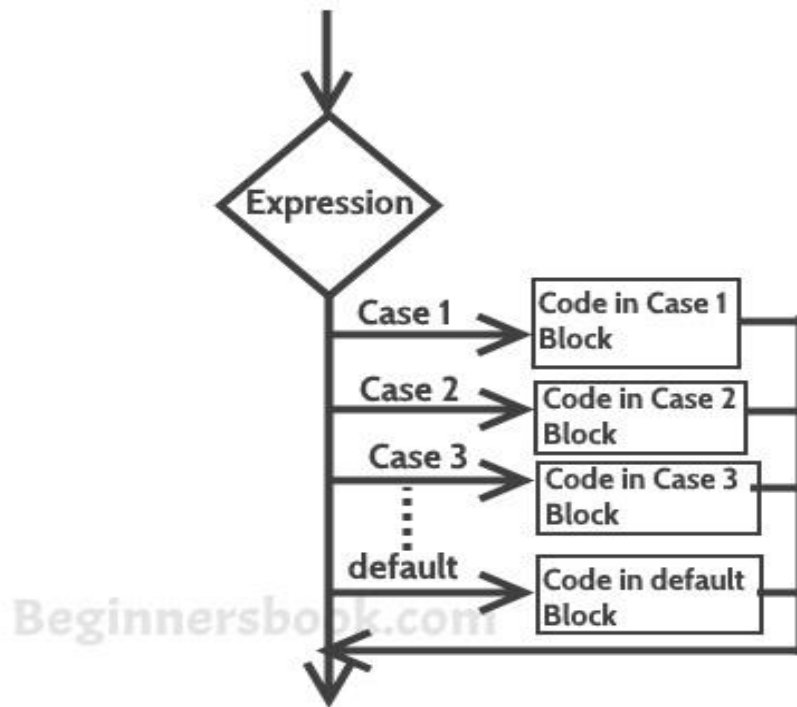
Switch Case statement in C++

Switch case statement is used when we have multiple conditions and we need to perform different action based on the condition. When we have multiple conditions and we need to execute a block of statements when a particular condition is satisfied. In such case either we can use lengthy **if..else-if statement** or switch case. The problem with lengthy if..else-if is that it becomes complex when we have several conditions. The switch case is a clean and efficient method of handling such scenarios.

The **syntax of Switch case** statement:

```
switch (variable or an integer expression)  
{  
    case constant:  
        //C++ code  
        ;  
    case constant:  
        //C++ code  
        ;  
    default:  
        //C++ code  
        ;  
}
```

Switch Case statement is mostly used with break statement even though the break statement is optional. We will first see an example without break statement and then we will discuss switch case with break



Break statement in Switch Case

Before we discuss about break statement, Let's see what happens when we don't use break statement in switch case. See the example below:

```
#include <iostream>
using namespace std;
int main(){
    int i=2;
    switch(i) {
        case 1:
            cout<<"Case1 "<<endl;
        case 2:
            cout<<"Case2 "<<endl;
        case 3:
            cout<<"Case3 "<<endl;
        case 4:
            cout<<"Case4 "<<endl;
        default:
            cout<<"Default "<<endl;
    }
    return 0;
}
```

Output:

Case2
Case3
Case4
Default

Let's take the same example but this time with break statement.

```
#include <iostream>
using namespace std;
int main(){
    int i=2;
    switch(i) {
        case 1:
            cout<<"Case1 "<<endl;
            break;
        case 2:
            cout<<"Case2 "<<endl;
            break;
        case 3:
            cout<<"Case3 "<<endl;
            break;
        case 4:
            cout<<"Case4 "<<endl;
            break;
        default:
            cout<<"Default "<<endl;
    }
    return 0;
}
```

Output:

Case2

Summary

Sr.No	Statement & Description
1	if statement An 'if' statement consists of a Boolean expression followed by one or more statements.
2	if...else statement An 'if' statement can be followed by an optional 'else' statement, which executes when the Boolean expression is false.

3	if...else if...else statement An 'if' statement can be followed by one or multiple else if statement and none of above is true then 'else' statement, which executes when the Boolean expression is false.
4	switch statement A 'switch' statement allows a variable to be tested for equality against a list of values.
5	nested statements You can use one statement inside another statement(s).

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