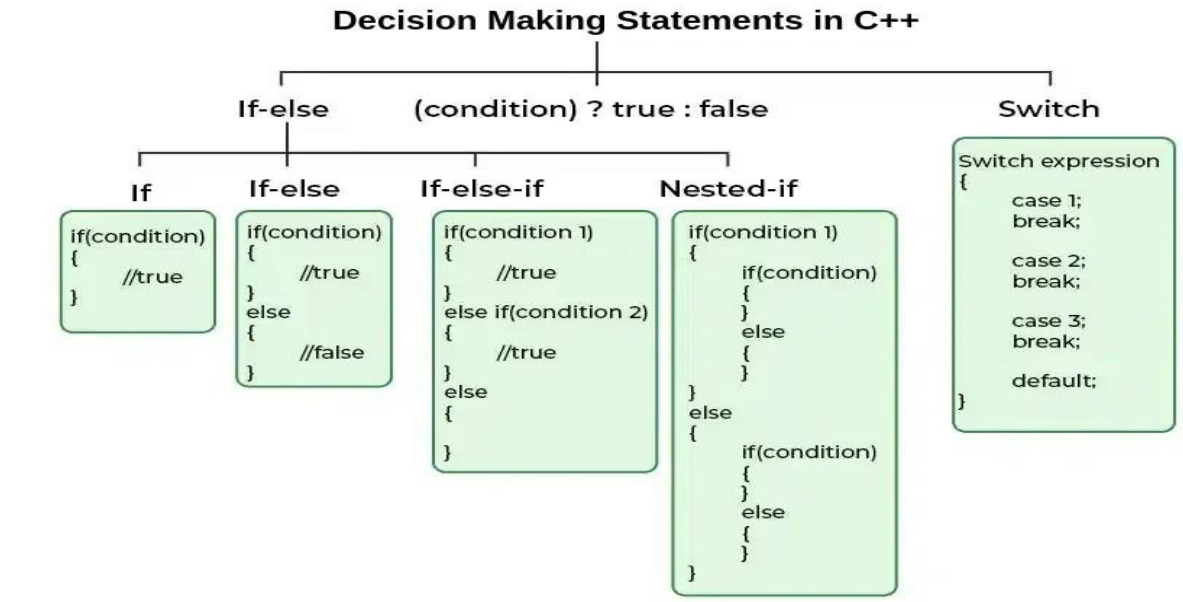
Decision Making in C++

Decision-making is the process to make a decision about which part of the code should be executed or not based on some condition. Decision-making in C++ involves the usage of **conditional statements** (also called decision control statements) to execute specific blocks of code primarily based on given situations and their results.
In C++, the following decision-making statements are available:



1. if Statement

In C++, the **if statement** is the simplest decision-making statement. It allows the execution of a block of code if the given condition is true. The body of the if statement is executed only if the given condition is true.

```
#include <iostream>
using namespace std;

int main() {
    int age = 19;

    // Check if age is greater than 18 fo
```

```
    // vote eligiblity
    if (age > 18) {
        cout << "allowed to vote";
    }
    return 0;
}
```

Output

```
allowed to vote
```

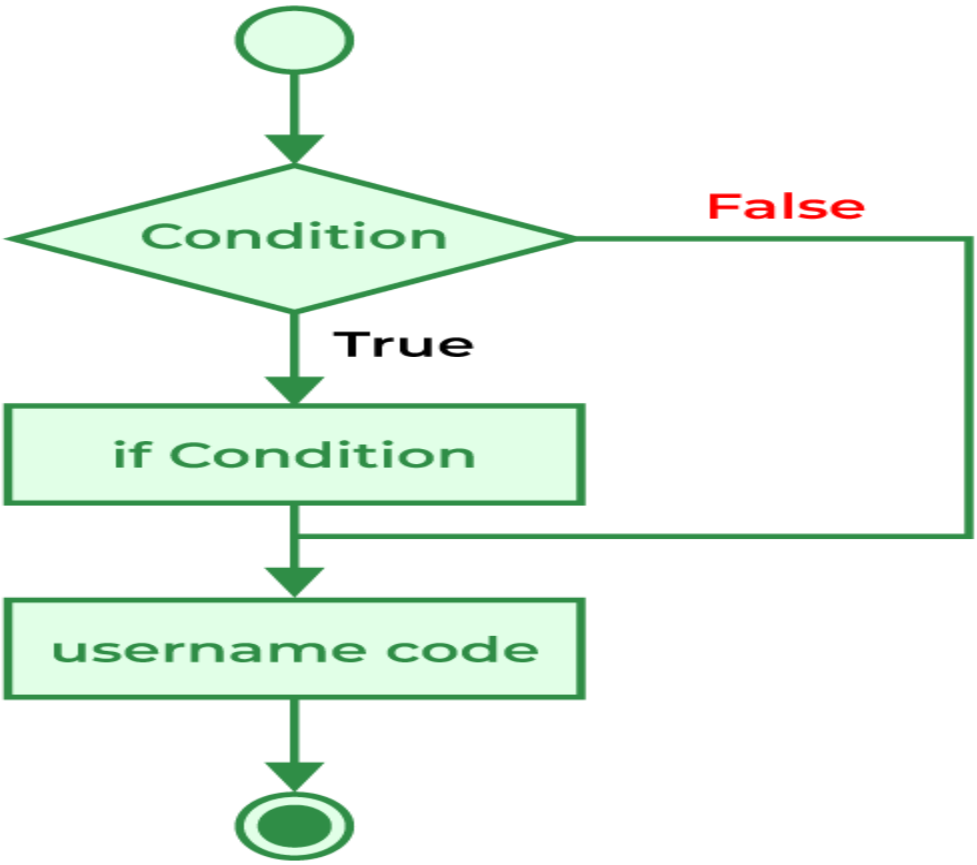
We can skip to write curly brasses if there is only line statement inside the curly brasses.

```
#include <iostream>
using namespace std;

int main() {
    int age = 19;
    if (age > 18)
        cout << "allowed to vote";
    return 0;
}
```

Output

```
allowed to vote
```

Flowchart:



2. if-else Statement

The **if else** is adecision-making statement allows us to make a decision based on the evaluation of a given condition. If the given condition evaluates to true then the code inside the 'if' block is executed and in case the condition is false, the code inside the 'else' block is executed.

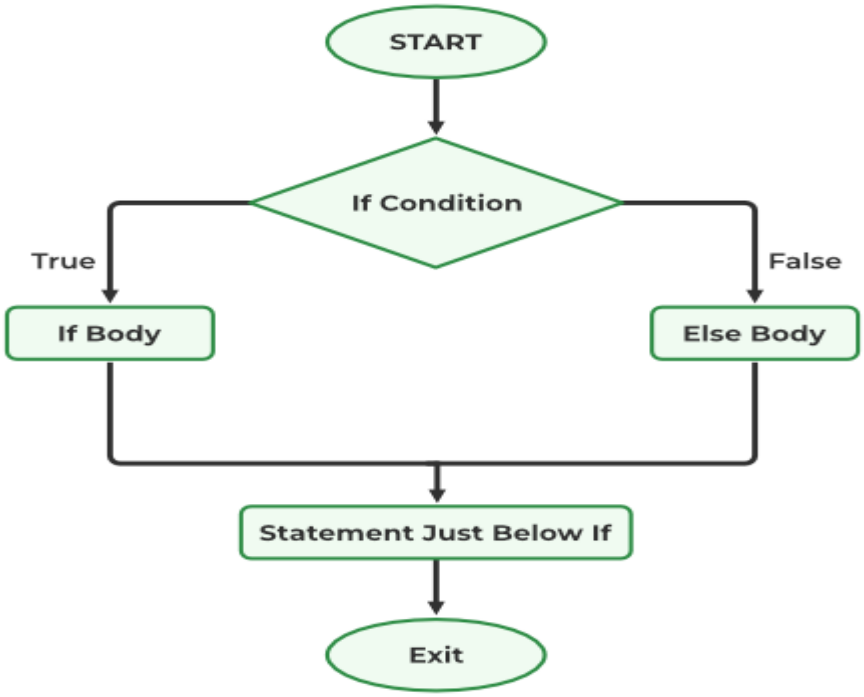
```
#include <iostream>
using namespace std;

int main() {
    int n = 5;

    // Using if-else to determine if the number is positive
    // or non positive
    if (n > 0) {
        cout << "number is positive.";
    }
    else {
        cout << "number is non-positive.";
    }
```

```
    return 0;
}
```

Output

```
number is positive.
```

Flowchart:



3. if else if Ladder

The **if else if Ladder** statements allow us to include additional situations after the preliminary if condition. The 'else if' condition is checked only if the above condition is not true, and the `else` is the statement that will be executed if none of the above conditions is true. If some condition is true, then not only the associated block is executed.

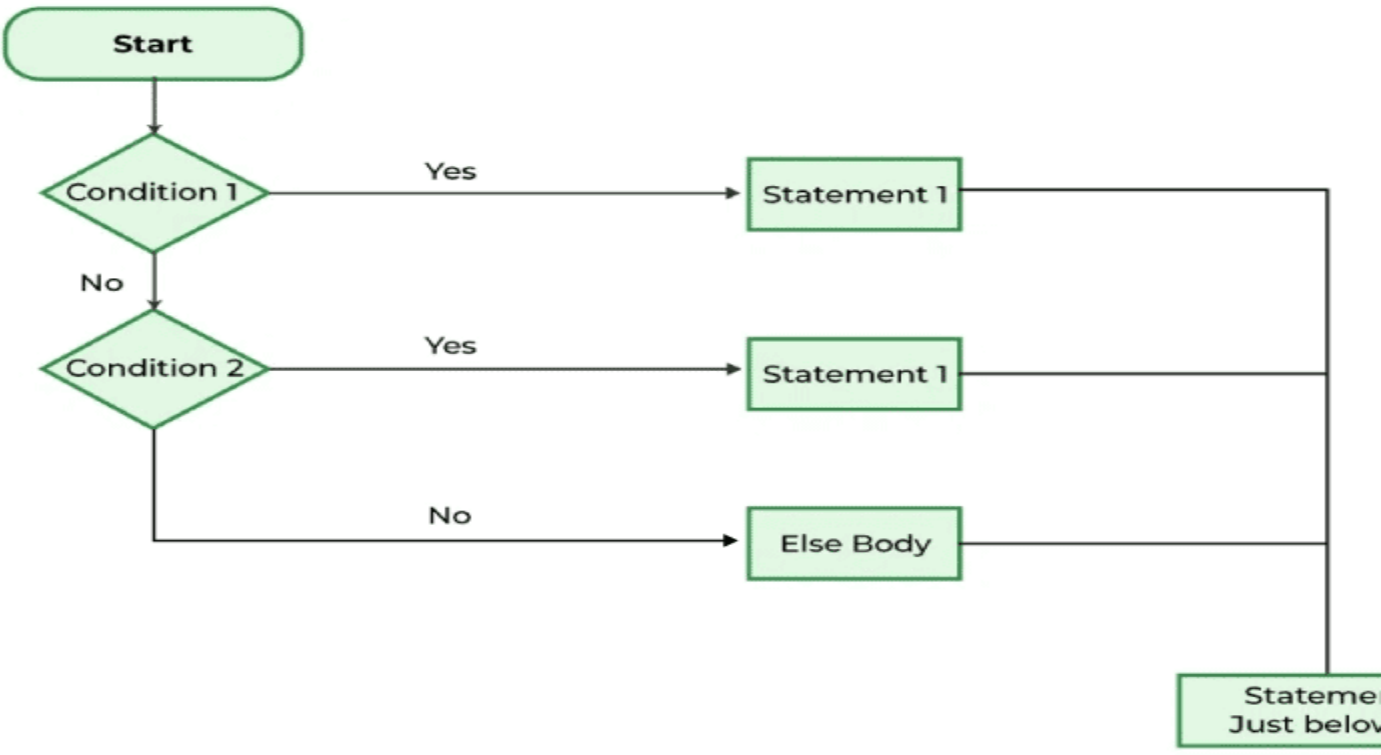
```
#include <iostream>
using namespace std;

int main() {
    int age = 18;
```

```
    // if this condition is true child is printed
    if (age < 13) {
        cout << "child";
    }

    // if above above if statement is not true then we check
    // this else if condition if it evalutes to true print
    // growing age
    else if (age >= 1 and age <= 18) {
        cout << "Growing stage";
    }

    // if none of above condition is true print adult
    else {
        cout << "adult";
    }
    return 0;
}
```

Output

```
Growing stage
```

Flowchart:



4. Nested if else

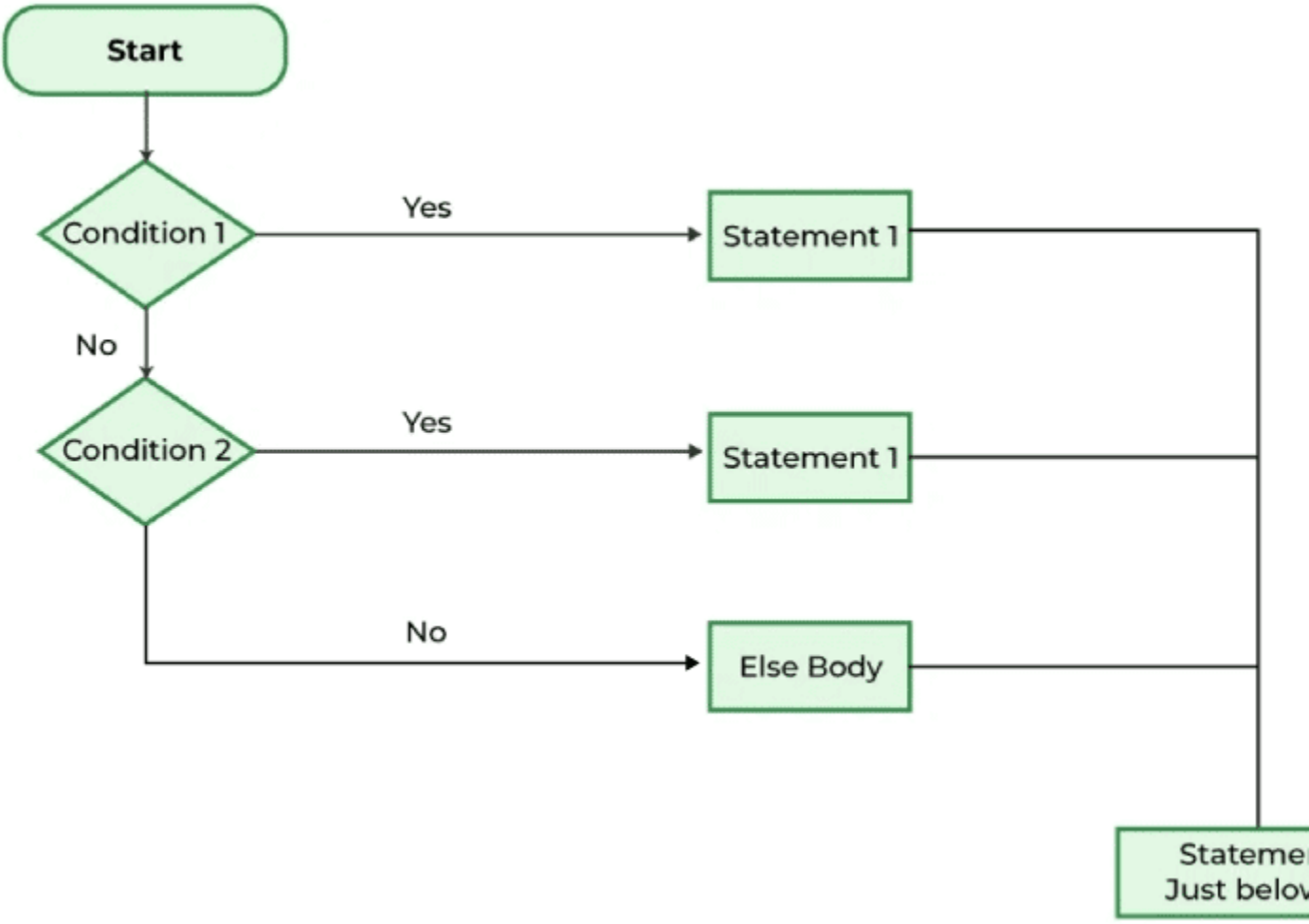
The **nested if else statement**contains an 'if' statement inside another 'if' statement. This structure lets in more complex selection-making by way of comparing multiple conditions. In this type of statement, multiple conditions are checked, and then the body of the last if statement is executed.

```
#include <iostream>
using namespace std;

int main() {
    int n = 44;

    // to check if n is positive
    if (n > 0) {

        // to check if the positive n is even or odd
        if (n % 2 == 0) {
            cout << "positive and even number";
        }
        else {
            cout << "positive and odd number";
        }
    }
    // to check if the n is 0
    else if (n == 0) {
        cout << "the number is zero";
    }
    // to check if the n is negative
    else {
        cout << "the number is negative";
    }
    return 0;
}
```

Output

```
positive and even number
```

Flowchart:



5. Switch Statement

In C++, the **switch statement** is used when multiple situations need to be evaluated primarily based on the value of a variable or an expression. switch statement acts as an alternative to multiple if statements or if-else ladder and has a cleaner structure and it is easy for handling multiple conditions.

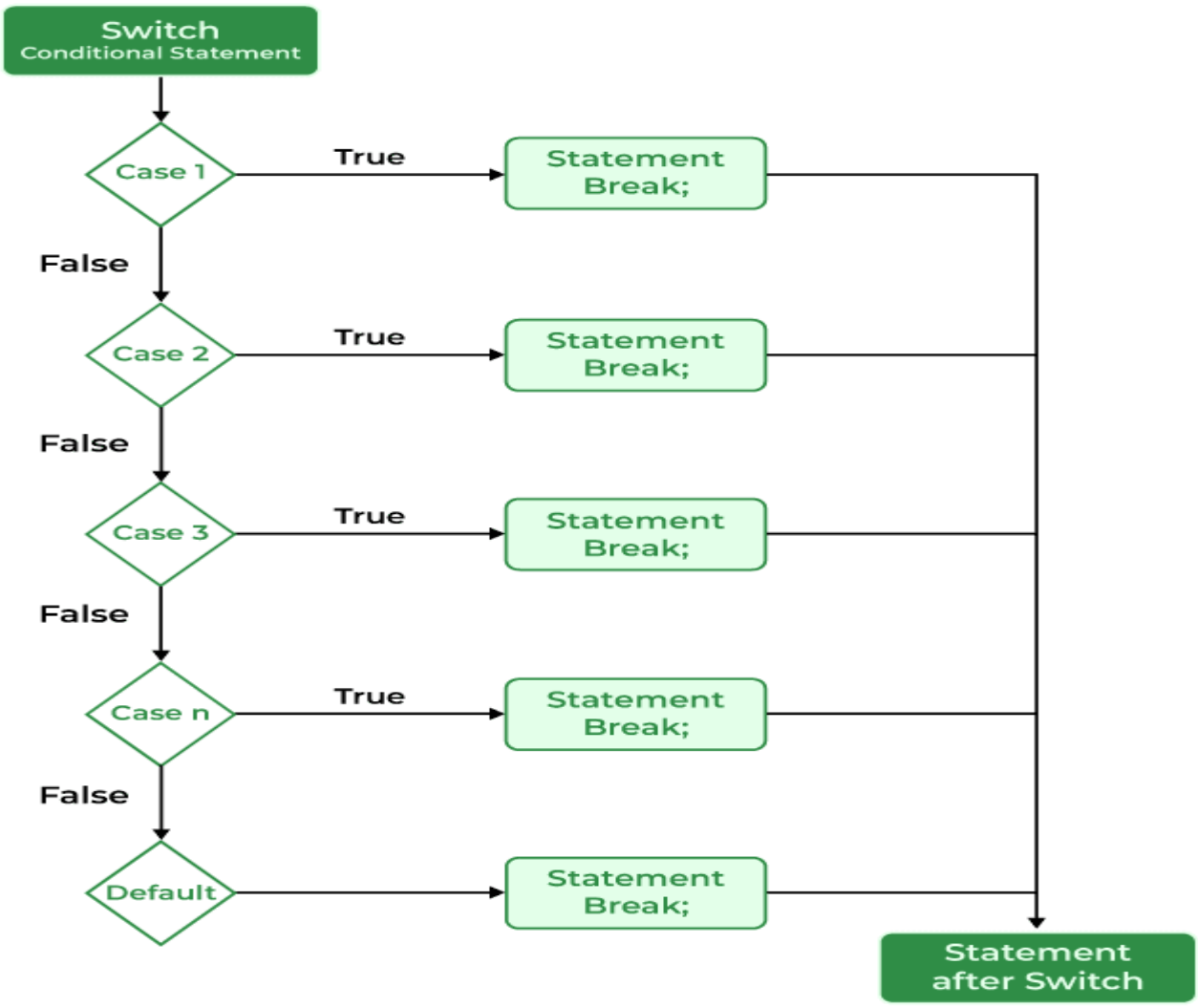
```
#include <iostream>
using namespace std;

int main() {
    char c = 'B';
    switch (c) {

    // if the input character is A then print GFG
    case 'A':
        cout << "GFG";
```

```
        break;

    // if the input character is B then print
    // GeeksforGeeks
    case 'B':
        cout << "GeeksforGeeks";
        break;
    default:

        // if the input character is invalid then print
        // invalid input
        cout << "invalid input";
    }
    return 0;
}
```

Output

```
GeeksforGeeks
```

Flowchart:



6. Ternary Operator (? :)

The **conditional operator** is also known as a **ternary operator**. It is used to write conditional operations provided by C++. The '?' operator first checks the given condition, if the condition is true then the first expression is executed otherwise the second expression is executed. It is an alternative to an if-else condition in C++.

```
expression ? statement_1 : statement_2;
```

```
#include <iostream>
using namespace std;

int main() {
    int num1 = 10, num2 = 40;
    int max;
```

```
    // if the condition is true then num1 will be printed
    // else num2 will printed
    max = (num1 > num2) ? num1 : num2;
    cout << max;
    return 0;
}
```

Output

```
40
```