Programming Fundamentals with C++

Lecture 7 – Conditional Statements

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Overview

- **The “ nested if ” Statement**
- **The “ nested if – else ” Structure**

The “nested if ” Statement

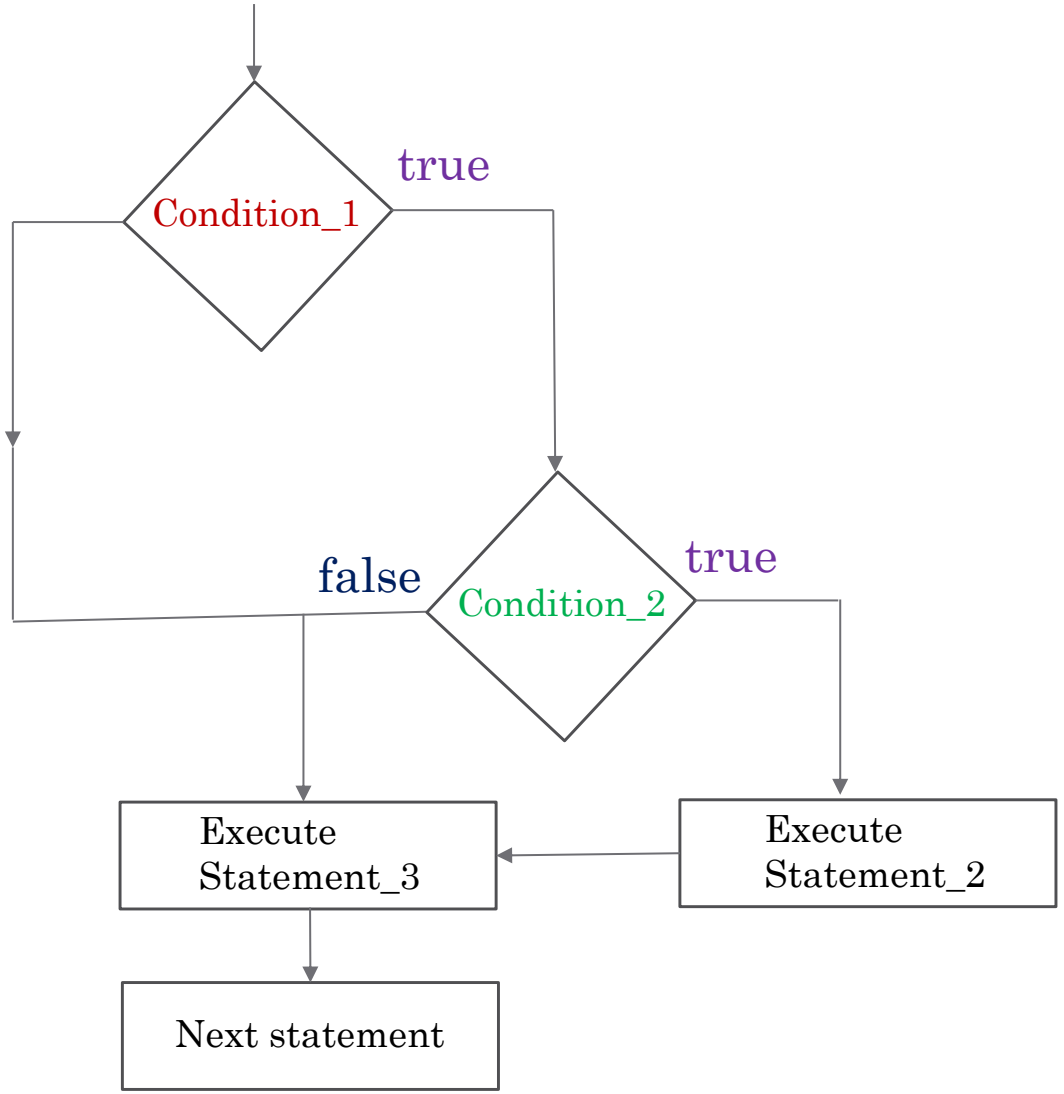
- When an “if statement” is used within another “if statement”, it is called **“nested if statement”**.
- The “nested if statement” is used for multi-way decision making.
- **Syntax**: The syntax of **nested if statement** is:

```
If (condition_1) {
        if (condition_2) {
                statement_2;
        }
        statement_3
}
```

- **Example Scenario**:
  - **Problem:** A student is eligible to pass only if:
  - Their attendance percentage is 75% or higher.
  - Their test score is 50 or above.
  - If both conditions are met, they pass; otherwise, they don’t.

The “nested if ” Statement

- **Flow Chart**



The “ nested if ” Statement

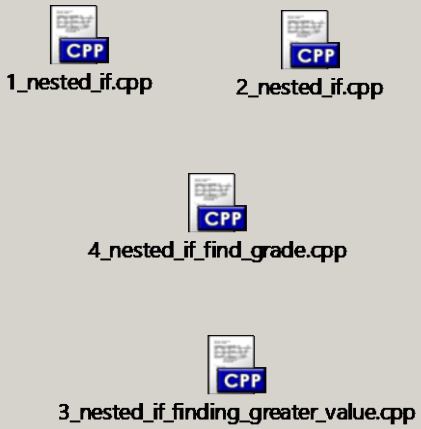
- **Code Example**

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

int main() {
    int attendance = 80;   // Student's attendance percentage
    int testScore = 55;    // Student's test score

    // Check attendance requirement
    if (attendance >= 75) {
        // If attendance is sufficient, check test score
        if (testScore >= 50) {
            cout << "The student passes!" << endl;
        } else {
            cout << "The student fails due to low test score." << endl;
        }
    } else {
        cout << "The student fails due to low attendance." << endl;
    }

    return 0;
}
```



The “ nested if – else ” Structure

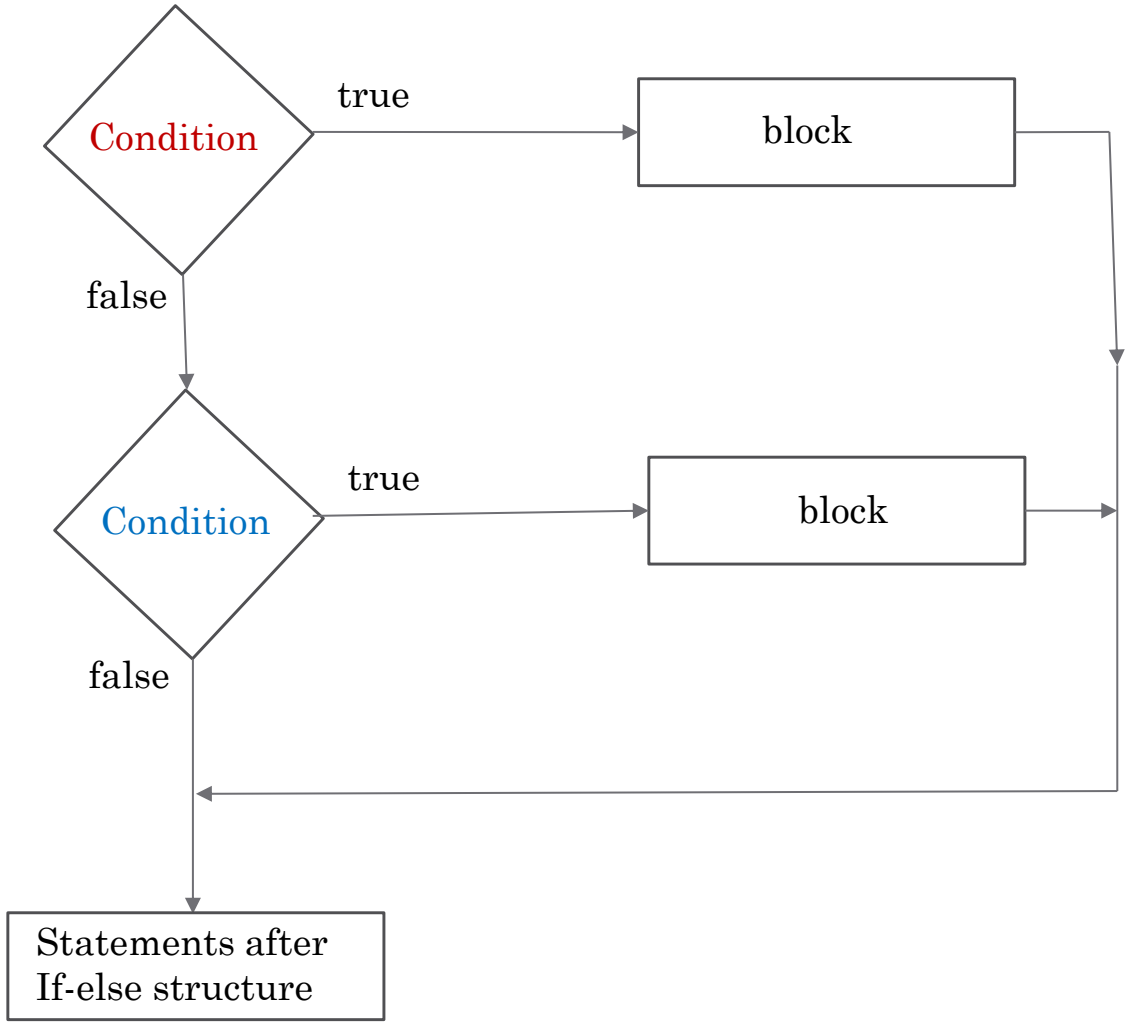
- When an **if-else** structure is placed in another **if-else** structure, it is called nested if else structure.
- It is used for multiple selection.
- **Purpose**: The **if...else** statement is used to execute a block of code among two alternatives. However, if we need to make a choice between more than two alternatives, we use the **if...else if...else** statement.

- **Syntax**: Its General syntax is:

```
if ( condition_1)
        statement_1;
else if (condition_2)
        statement_2;
else if (condition_3)
        Statement_3;
……..
……..
else if (condition_n)
        statement_n;
```

The “ nested if – else ” Structure

- **Flow Chart**



The “ nested if – else ” Structure

Example Scenario

Imagine a grading system where a student's score determines their letter grade:

- If the score is 90 or above, the grade is an "A".
- If the score is 80 or above (but less than 90), the grade is a "B".
- If the score is 70 or above (but less than 80), the grade is a "C".
- If the score is 60 or above (but less than 70), the grade is a "D".
- Any score below 60 results in an "F".

The “ nested if – else ” Structure

Code Example

5_nested_if_else.cpp

6_nested_if_else_grade_finder.cpp

7_nested_if_else_calculator.cpp

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

int main() {
    int score = 85;  // Example student score
    char grade;

    if (score >= 90) {
        grade = 'A';
    } else if (score >= 80) {
        grade = 'B';
    } else if (score >= 70) {
        grade = 'C';
    } else if (score >= 60) {
        grade = 'D';
    } else {
        grade = 'F';
    }

    cout << "The student's grade is: " << grade << endl;
    return 0;
}
```

Thank You