

# SPM

# Program Control Functions

By

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# Program Control Functions

2	Program Control Functions	
	2.1	Decision Making and Branching Control Structures: Two Way Selection, Multiway Selection
	2.2	Looping Control Structures, Flag Concept, Counting Loops
	2.3	Documentation and Making Source Code Readable

# Conditional Branching Statements:

1. Simple if statement
2. if... else statement
3. Nested if...else statement
4. else...if ladder
5. Switch statement

# Conditional Branching Statements in C:

## 1. Simple if statement

Syntax:

```
if(test-expression/condition)
```

```
{
```

```
True statement-block ;
```

```
}
```

```
statement-x;
```

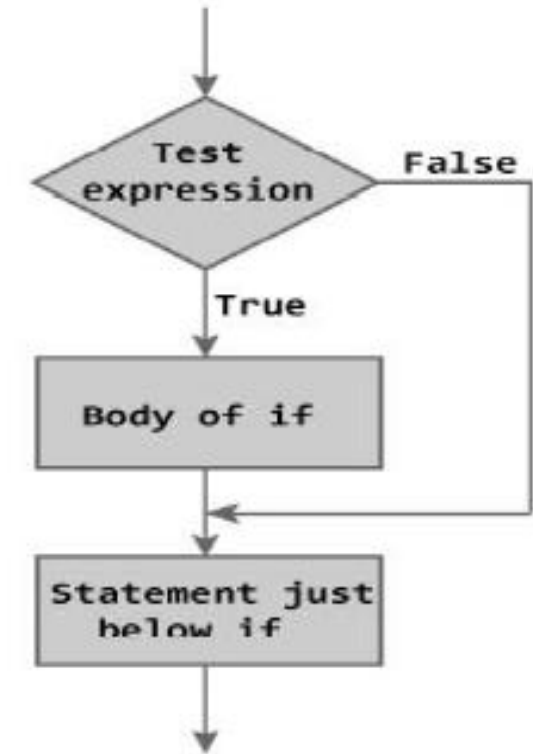


Figure: Flowchart of if Statement

# Conditional Branching Statements in C++:

## 1. Simple if statement

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

int main() {
    int age = 20;

    if (age >= 18) {
        cout << "You are eligible to vote." << endl;
    }

    return 0;
}
```

# if statement analogy (Y-intersection)



# Conditional Branching Statements in C:

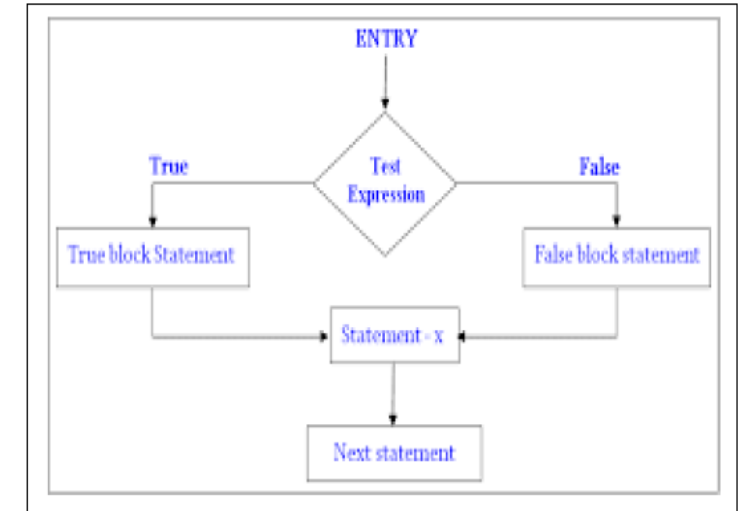
1. Simple if statement
2. **if... else statement**

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

```
int main() {
    int number = 5;

    if (number % 2 == 0) {
        cout << "Even number" << endl;
    } else {
        cout << "Odd number" << endl;
    }

    return 0;
}
```



# Example

- Write a program to read any number as input through the keyboard and find out whether it is Odd Number or Even Number.



```
#include <iostream> // Required for input/output operations (cin, cout)
using namespace std;
int main() {
    int number; // Declare an integer variable to store the input number
    // Prompt the user to enter a number
    cout << "Enter an integer: ";
    // Read the integer input from the keyboard
    cin >> number;
    // Check if the number is even or odd using the modulo operator
    // If a number divided by 2 has a remainder of 0, it's even.
    // Otherwise, it's odd.
    if (number % 2 == 0) {
        cout << number << " is an Even Number." << endl;
    } else {
        cout << number << " is an Odd Number." << endl;
    }
    return 0; // Indicate successful program execution
}
```

- WAP to find largest number out of two number

```
#include <iostream> // Required for input/output
operations (cin, cout)
#include <algorithm> // Required for the std::max
function
int main() {
    int num1, num2; // Declare two integer
    variables to store the numbers
    // Prompt the user to enter the first number
    std::cout << "Enter the first number: ";
    std::cin >> num1; // Read the first number from
    the user
    // Prompt the user to enter the second number
    std::cout << "Enter the second number: ";
    std::cin >> num2; // Read the second number
    from the user
    // Method 1: Using if-else statements
    if (num1 > num2) {
        std::cout << num1 << " is the largest number."
        << std::endl;
    } else if (num2 > num1) {
        std::cout << num2 << " is the largest number."
        << std::endl;
    } else {
        std::cout << "Both numbers are equal." <<
        std::endl;
    }
    // Method 2: Using the ternary operator
    (conditional operator)
    // int largest = (num1 > num2) ? num1 : num2;
    // std::cout << "The largest number is: " <<
    largest << std::endl;
    // Method 3: Using std::max function (from
    <algorithm> header)
    // int largest_with_max = std::max(num1,
    num2);
    // std::cout << "The largest number (using
    std::max) is: " << largest_with_max << std::endl;
    return 0; // Indicate successful program
    execution
}
```

## Conditional Branching Statements in C:

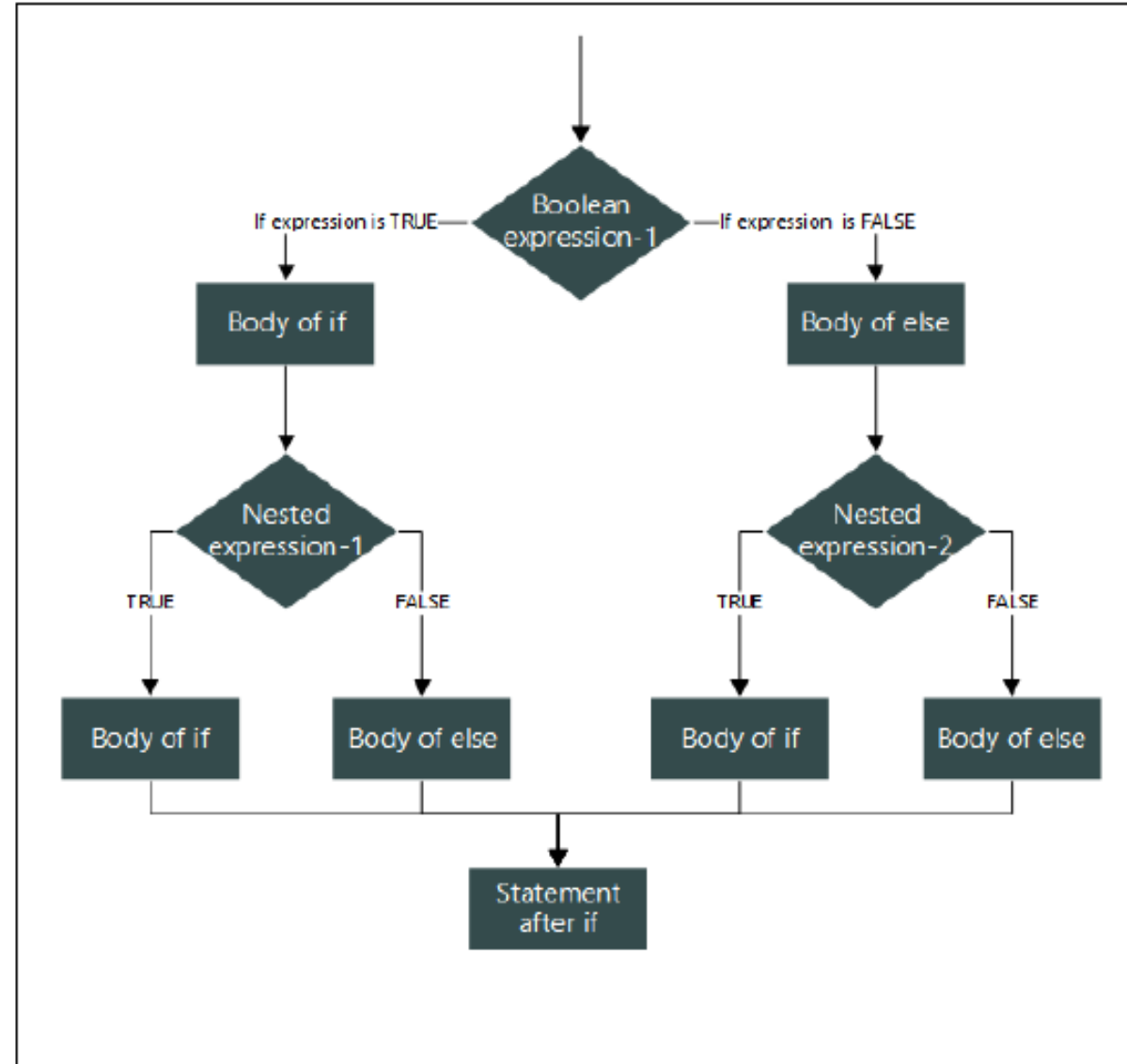
1. Simple if statement
2. if... else statement
3. **Nested if...else statement**

Syntax:

```
if(test-condition-1)
{
    if(test-condition-2)
    {
        statement-1;
    }
    else
    {
        statement-2;
    }
}
else
{
    if(test-condition-3)
    {
        statement-3;
    }
    else
    {
        statement-4;
    }
}
statement-x
```

# if statement analogy (Y-intersection)





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

int main() {
    int age = 25;
    bool hasID = true;

    if (age >= 18) {
        if (hasID) {
            cout << "Entry allowed." << endl;
        } else {
            cout << "ID required." << endl;
        }
    } else {
        cout << "Underage." << endl;
    }

    return 0;
}
```

# Write a program to check person is eligible for work or not.

If age  $< 18$ ....Minor and not eligible

If age  $\geq 18$  and age  $\leq 60$  eligible

Else You are too old to work



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

int main() {
    int age;

    cout << "Enter your age: ";
    cin >> age;

    if (age < 18) {
        cout << "You are a Minor and not eligible to work."
        << endl;
    }
    else if (age >= 18 && age <= 60) {
        cout << "You are eligible to work." << endl;
    }
    else {
        cout << "You are too old to work." << endl;
    }

    return 0;
}
```

# Practice

- Write a program to identify largest of three number.
- Write a program that accepts the ages of Ram, Sham, and Madhusudhan from the user, and determines who is the youngest among them

```
#include <iostream>
using namespace std;
int main() {
    int ramAge, shamAge, madhuAge;

    // Input ages
    cout << "Enter Ram's age: ";
    cin >> ramAge;

    cout << "Enter Sham's age: ";
    cin >> shamAge;

    cout << "Enter Madhusudhan's age: ";
    cin >> madhuAge;
    // Check youngest
    if (ramAge < shamAge && ramAge <
madhuAge) {
        cout << "Ram is the youngest." << endl;
```

```
    }
    else if (shamAge < ramAge && shamAge <
madhuAge) {
        cout << "Sham is the youngest." << endl;
    }
    else if (madhuAge < ramAge && madhuAge
< shamAge) {
        cout << "Madhusudhan is the youngest."
<< endl;
    }
    else {
        cout << "Two or more have the same
youngest age." << endl;
    }

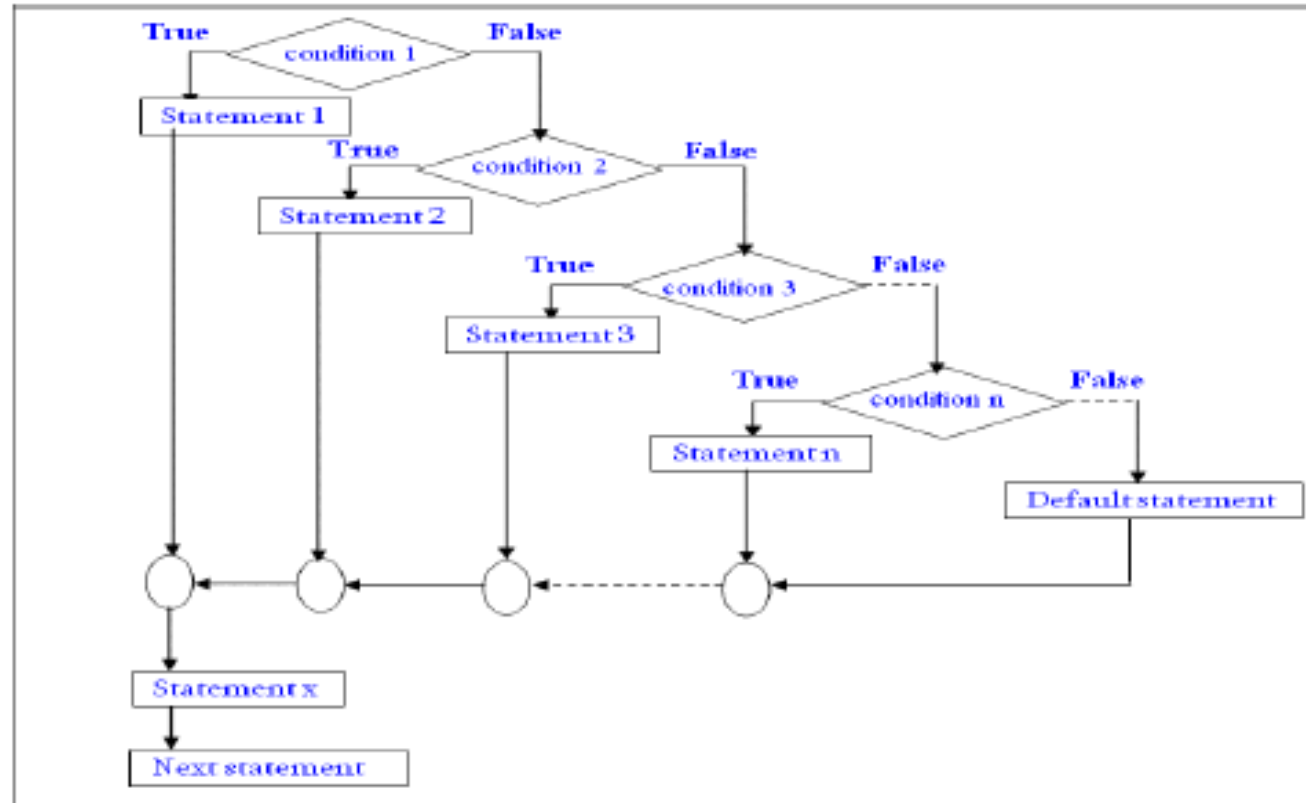
    return 0;
}
```

## Conditional Branching Statements in C:

1. Simple if statement
2. if... else statement
3. Nested if...else statement
4. **else...if ladder**

### Syntax:

```
if(condition-1)  
    Statement-1;  
else if(condition-2)  
    Statement -2;  
else if(condition-3)  
    Statement -3;  
else if(condition-n)  
    Statement -n;  
else  
    Default Statement;  
Statement -x;
```



- Write a program to print the grade of student using if else ladder statement. (Assume user enters marks for 5 subjects)

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

int main() {
    int m1, m2, m3, m4, m5;
    float total, average;

    // Input marks
    cout << "Enter marks of 5
subjects: ";
    cin >> m1 >> m2 >> m3 >> m4 >>
m5;

    // Calculate total and average
    total = m1 + m2 + m3 + m4 + m5;
    average = total / 5.0;

    cout << "Average Marks = " <<
average << endl;
```

```
// Grade using if-else ladder
if (average >= 90) {
    cout << "Grade: A+" << endl;
}
else if (average >= 80) {
    cout << "Grade: A" << endl;
}
else if (average >= 70) {
    cout << "Grade: B" << endl;
}
else if (average >= 60) {
    cout << "Grade: C" << endl;
}
else if (average >= 50) {
    cout << "Grade: D" << endl;
}
else {
    cout << "Grade: F (Fail)" <<
endl;
}

return 0;
}
```

# Contact Details

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# Thank you