

ELEG 1043

Computer Applications in Engineering





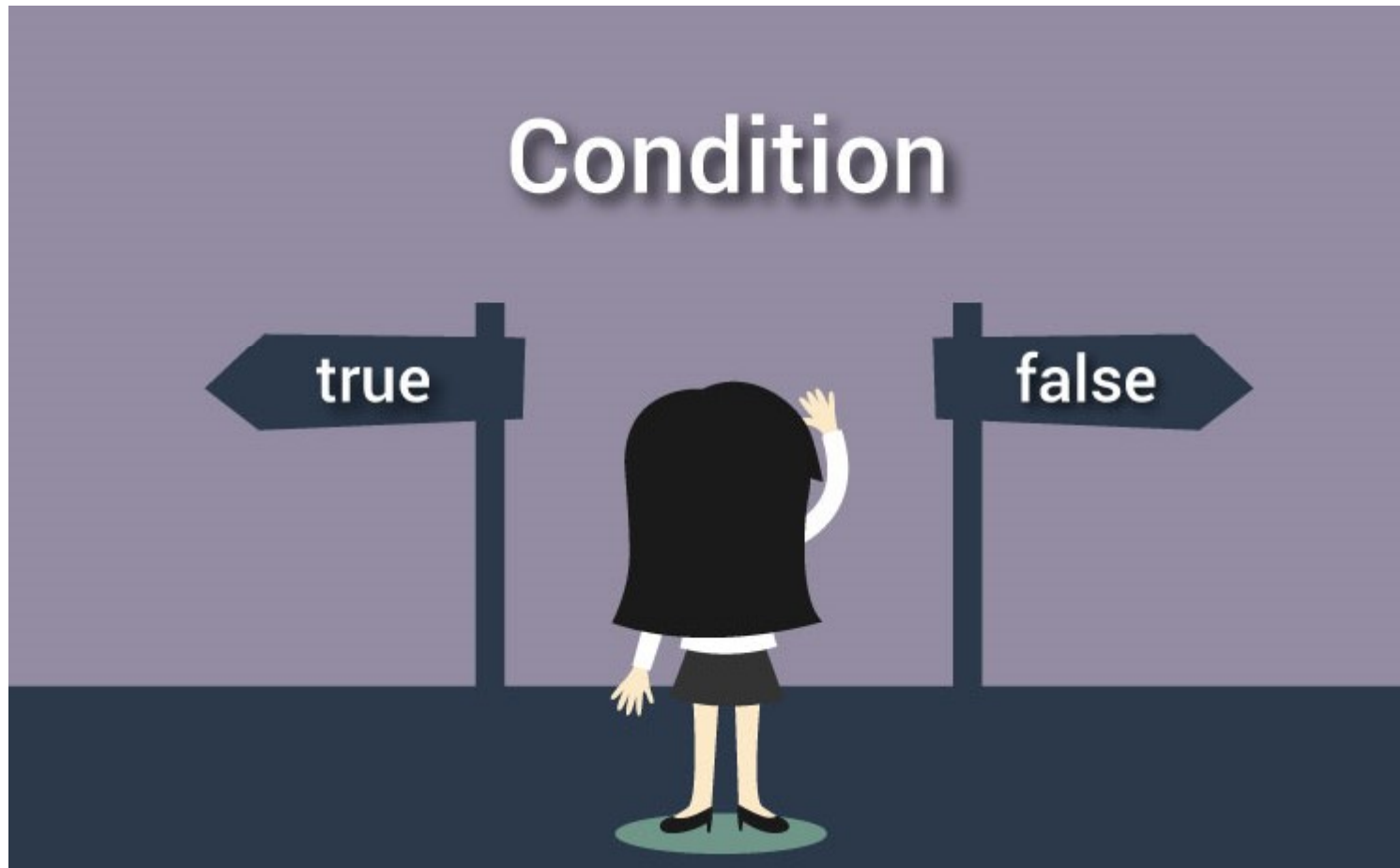
Lab Course 2

C++ FOR ENGINEERS
AND SCIENTISTS ²

Acknowledgement

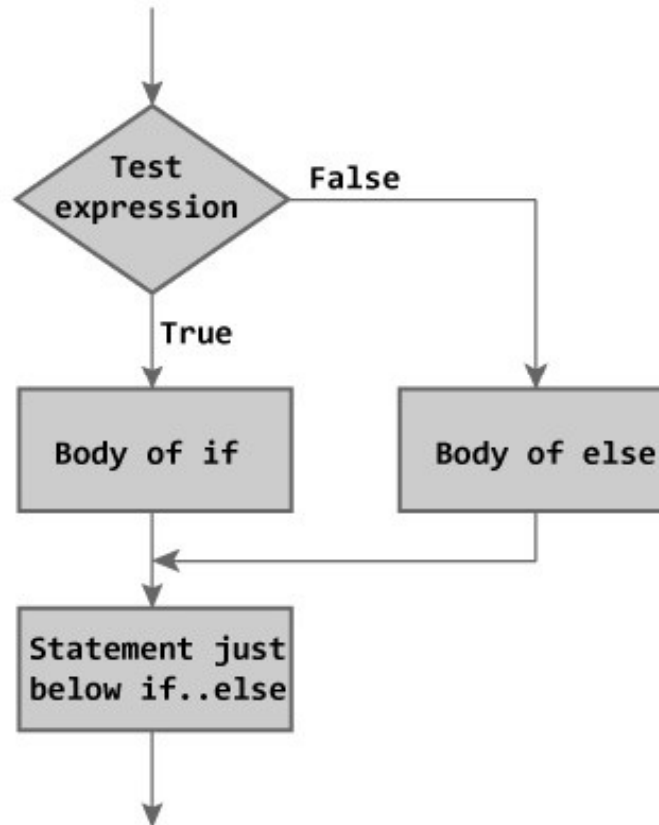
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Selection Criteria



<https://www.programiz.com/c-programming/c-if-else-statement>

Flowchart of if statement



Exercise 1

- Write a program that is to judge if the number is the **even** number or **odd** number, where the number is received from keyboard.

Answer

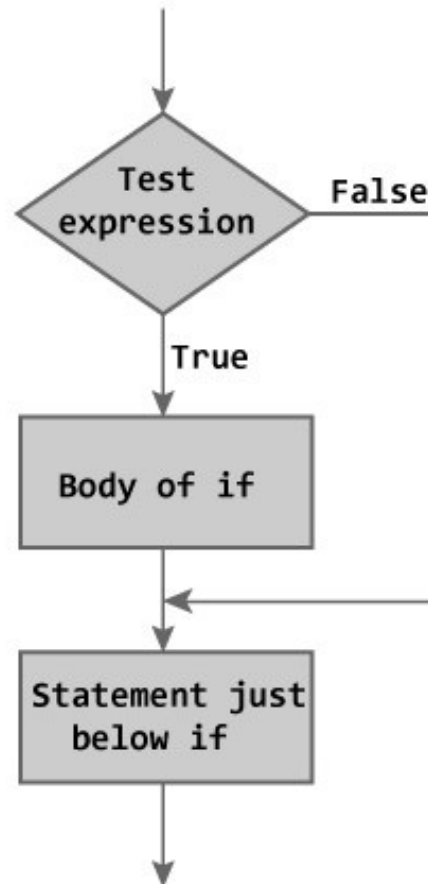
```
#include <iostream>
using namespace std;

int main()
{
    int number;
    cout<<"Enter an integer: \n";
    cin>>number;

    // True if remainder is 0
    if( number%2 == 0 )
        cout<<number<<" is an even integer.\n";
    else
        cout<<number<<" is an odd integer.\n";

    return 0;
}
```

Flowchart of if statement



Exercise 2

- Write a program that is to judge if the number is **less than 0**, where the number is received from keyboard.

Answer

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

int main()
{
    int number;
    cout<<"Enter an integer: \n";
    cin>>number;

    // Test expression is true if number is less than 0
    if (number < 0)
    {
        cout<<"You entered "<<number<<"\n";
    }

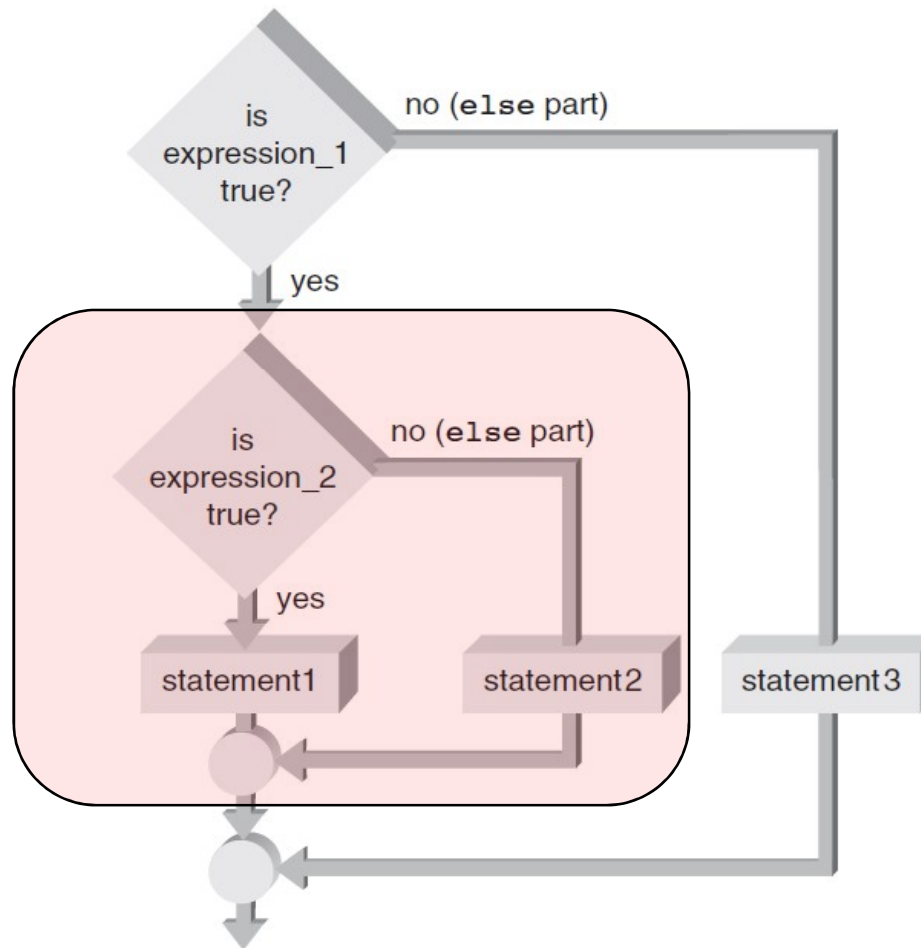
    cout<<"The if statement is easy.";
    return 0;
}
```

Logical Operators

- AND (&&): Condition is true only if **both expressions are true**
- OR (||): Condition is true if **either one or both of the expressions is true**
- NOT (!): Changes an expression to its opposite state; **true becomes false, false becomes true**

Nested if Statements (continued)

Figure 4.4a
Nested within the
if part



Exercise 3

- Write a program that is to judge if the number falls in the range **$(-10, 0)$** , where the number is received from keyboard.

Answer 1

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

int main()
{
    int number;
    cout<<"Enter an integer: \n";
    cin>>number;

    // Test expression is true if number is less than 0
    if (number < 0)
    {
        if (number > -10)
            cout<<"You entered " << number << " in the range (-10, 0)\n";
    }

    cout<<"The if statement is easy.";
    return 0;
}
```

Answer 2

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

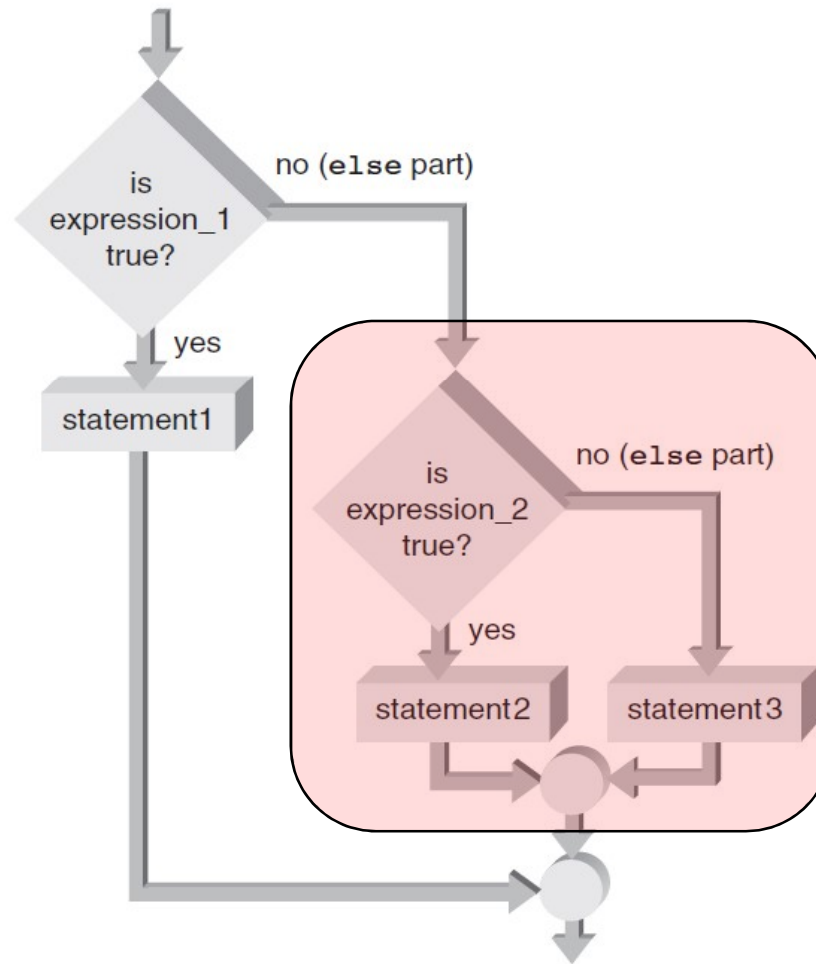
int main()
{
    int number;
    cout<<"Enter an integer: \n";
    cin>>number;

    // Test expression is true if number is less than 0
    if ((number < 0) and (number > -10))
    {
        cout<<"You entered " << number << " in the range (-10, 0)\n";
    }

    cout<<"The if statement is easy.";
    return 0;
}
```

Nested `else` Statements (continued)

Figure 4.4b
Nested within the
`else` part



Exercise 4

- Write a program that is to judge if the number is the **even** number or **odd** number and if the number is odd and positive, display its value and “ is a positive odd number.”, where the number is received from keyboard.

Answer

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

int main()
{
    int number;
    cout<<"Enter an integer: \n";
    cin>>number;

    // True if remainder is 0
    if( number%2 == 0 )
        cout<<number<<" is an even integer.\n";
    else
        if number > 0
            cout<<number<<" is a positive odd integer.\n";

    return 0;
}
```

The `if-else` Chain (continued)

- General form of an **`if-else`** chain

```
if (expression_1)
    statement1;
else if (expression_2)
    statement2;
else if (expression_3)
    statement3;
    .
    .
    .
else if (expression_n)
    statementn;
else
    last_statement;
```

Example 1

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

int main()
{
    int number1, number2;
    cout<<"Enter two integers: \n";
    cin>>number1>>number2;

    if( number1 == number2)
        cout<<number1<<" is equal to "<<number2;
    else if( number1 > number2)
        cout<<number1<<" is larger than"<<number2;
    else
        cout<<number1<<" is smaller than"<<number2;

    return 0;
}
```

The switch Statement



<https://www.programiz.com/c-programming/c-switch-case-statement>

Example 2

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

int main()
{
    int num=2;

    switch(num)
    {
        case 1:
            cout<<"Case1: Value is: "<<num; break;
        case 2:
            cout<<"Case2: Value is: "<<num; break;
        case 3:
            cout<<"Case3: Value is: "<<num; break;
        default:
            cout<<"Default: Value is: "<<num;
    }

    return 0;
}
```

while Loops



Exercise 5

- Write a program that is to display the number from 1 to 100 with *while* loops.

Answer

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

int main()
{
    int number = 1;

    while(number < 101)
    {
        cout << number << endl;
        number = number + 1;
    }

    return 0;
}
```

Exercise 6

- Write a program that is to receive 10 numbers from the keyboard and display “You lose!” if the number is less than 0, which is implemented with *while* loops and *if* statement.

Answer

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

int main()
{
    int number;
    int count = 0

    while(count < 10)
    {
        if(number < 0)
        {
            cout<<"You lose!"<<endl;
        }
        count = count + 1;
    }

    return 0;
}
```