



Nested IF Statements



Review

Single **IF**
Statement

```
if(condition){  
  
}
```

Multiple **IF**
Statement

```
if(condition){  
  
}  
if (condition2){  
  
}
```

IF-Else
Statement

```
if(condition){  
  
}  
else{  
  
}
```

Strengthening the Concept: Working Example

Write a **C++** program that takes two numbers as input from the user and prints "**Largest**" when the first number is largest; otherwise, it prints "**Not Largest**".



Test Cases

If user enters first number greater than the second number

```
C:\C++>c++ example.cpp -o example.exe
```

```
C:\C++>example.exe
```

```
Enter First number: 5
```

```
Enter Second number: 4
```

```
Largest
```

If user enters first number smaller than the second number

```
C:\C++>c++ example.cpp -o example.exe
```

```
C:\C++>example.exe
```

```
Enter First number: 6
```

```
Enter Second number: 9
```

```
Not Largest
```

Solution

```
1  #include <iostream>
2  using namespace std;
3  int main(){
4      int number1, number2;
5      cout << "Enter First number: ";
6      cin >> number1;
7      cout << "Enter Second number: ";
8      cin >> number2;
9      if(number1 > number2){
10         cout << "Largest" << endl;
11     }
12     else{
13         cout << "Not Largest" << endl;
14     }
15 }
```

Updated Requirement: Working Example

Now, write a **C++** program that inputs three numbers from the user and prints "**Largest**" if the first number is largest and prints "**Not Largest**" otherwise.



Output on the Console

```
C:\C++>c++ example.cpp -o example.exe
```

```
C:\C++>example.exe
```

```
Enter First Number: 5
```

```
Enter Second Number: 4
```

```
Enter Third Number: 3
```

```
Largest
```

```
C:\C++>
```

Solution

Will this
Solution return
the correct
Result?

number1 = 4

number2 = 5

number3 = 2

```
1  #include <iostream>
2  using namespace std;
3  int main(){
4      int number1, number2, number3;
5      cout << "Enter First number: ";
6      cin >> number1;
7      cout << "Enter Second number: ";
8      cin >> number2;
9      cout << "Enter Third number: ";
10     cin >> number3;
11     if (number1 > number2){
12         cout << "Largest" << endl;
13     }
14     else if (number1 > number3){
15         cout << "Largest" << endl;
16     }
17     else {
18         cout << "Not Largest" << endl;
19     }
20 }
```


Solution

Will this
Solution return
the correct
Result?



number1 = 4
number2 = 5
number3 = 2

```
1 #include <iostream>
2 using namespace std;
3 int main(){
4     int number1, number2, number3;
5     cout << "Enter First number: ";
6     cin >> number1;
7     cout << "Enter Second number: ";
8     cin >> number2;
9     cout << "Enter Third number: ";
10    cin >> number3;
11    if (number1 > number2){
12        cout << "Largest" << endl;
13    }
14    else if (number1 > number3){
15        cout << "Largest" << endl;
16    }
17    else {
18        cout << "Not Largest" << endl;
19    }
20 }
```

Solution

Will this
Solution return
the correct
Result?



This type of conditions
are called **simultaneous**
conditions that need to
be checked in **parallel**

```
1 #include <iostream>
2 using namespace std;
3 int main(){
4     int number1, number2, number3;
5     cout << "Enter First number: ";
6     cin >> number1;
7     cout << "Enter Second number: ";
8     cin >> number2;
9     cout << "Enter Third number: ";
10    cin >> number3;
11    if (number1 > number2){
12        cout << "Largest" << endl;
13    }
14    else if (number1 > number3){
15        cout << "Largest" << endl;
16    }
17    else {
18        cout << "Not Largest" << endl;
19    }
20 }
```

Another Solution

Will this
Solution return
the correct
Result?

number1 = 4

number2 = 5

number3 = 2

```
1  #include <iostream>
2  using namespace std;
3  main() {
4      int number1, number2, number3;
5      cout << "Enter First Number: ";
6      cin >> number1;
7      cout << "Enter Second Number: ";
8      cin >> number2;
9      cout << "Enter Third Number: ";
10     cin >> number3;
11     if(number1 > number2){
12         if (number1 > number3) {
13             cout << "Largest" << endl;
14         }
15     }
16     else{
17         cout << "Not Largest" << endl; }
18 }
```

Another Solution

Will this
Solution return
the correct
Result?



number1 = 4

number2 = 5

number3 = 2

```
1  #include <iostream>
2  using namespace std;
3  main() {
4      int number1, number2, number3;
5      cout << "Enter First Number: ";
6      cin >> number1;
7      cout << "Enter Second Number: ";
8      cin >> number2;
9      cout << "Enter Third Number: ";
10     cin >> number3;
11     if(number1 > number2){
12         if (number1 > number3){
13             cout << "Largest" << endl;
14         }
15     }
16     else{
17         cout << "Not Largest" << endl; }
18 }
```

Another Solution

Will this
Solution return
the correct
Result?

number1 = 5

number2 = 4

number3 = 6

```
1  #include <iostream>
2  using namespace std;
3  main() {
4      int number1, number2, number3;
5      cout << "Enter First Number: ";
6      cin >> number1;
7      cout << "Enter Second Number: ";
8      cin >> number2;
9      cout << "Enter Third Number: ";
10     cin >> number3;
11     if(number1 > number2){
12         if (number1 > number3){
13             cout << "Largest" << endl;
14         }
15     }
16     else{
17         cout << "Not Largest" << endl; }
18 }
```

Another Solution

Will this
Solution return
the correct
Result?



number1 = 5
number2 = 4
number3 = 6

```
1 #include <iostream>
2 using namespace std;
3 main() {
4     int number1, number2, number3;
5     cout << "Enter First Number: ";
6     cin >> number1;
7     cout << "Enter Second Number: ";
8     cin >> number2;
9     cout << "Enter Third Number: ";
10    cin >> number3;
11    if(number1 > number2){
12        if (number1 > number3){
13            cout << "Largest" << endl;
14        }
15    }
16    else{
17        cout << "Not Largest" << endl;
18    }
```

Another Solution

Will this
Solution return
the correct
Result?



number1 = 4
number2 = 5
number3 = 2

```
1 #include <iostream>
2 using namespace std;
3 main() {
4     int number1, number2, number3;
5     cout << "Enter First Number: ";
6     cin >> number1;
7     cout << "Enter Second Number: ";
8     cin >> number2;
9     cout << "Enter Third Number: ";
10    cin >> number3;
11    if(number1 > number2){
12        if (number1 > number3){
13            cout << "Largest" << endl;
14        }
15        else{
16            cout << "Not Largest" << endl;
17        }
18    }
19    }
```

Another Solution

Will this
Solution return
the correct
Result?



number1 = 5
number2 = 4
number3 = 6

```
1 #include <iostream>
2 using namespace std;
3 main() {
4     int number1, number2, number3;
5     cout << "Enter First Number: ";
6     cin >> number1;
7     cout << "Enter Second Number: ";
8     cin >> number2;
9     cout << "Enter Third Number: ";
10    cin >> number3;
11    if(number1 > number2){
12        if (number1 > number3){
13            cout << "Largest" << endl;
14        }
15        else{
16            cout << "Not Largest" << endl;
17        }
18    }
19    else{
20        cout << "Not Largest" << endl;
21    }
22 }
```


Another Working Example

Write a **Program** to check if the number entered by the user is between **10** and **100**.



Solution

```
1  #include<iostream>
2  using namespace std;
3  main(){
4      cout<<"Enter a number ";
5      int number;
6      cin>>number;
7      if(number > 10){
8          if(number < 100){
9              cout<<"Number is between 10 and 100 ";
10             }
11             else{
12                 cout<<"Number is greater than 100 ";
13             }
14         }
15         else{
16             cout<<"Number is below 10 ";
17         }
18     }
```

Learning Outcome

In this lecture, we learnt how to write a C++ Program that solves a problem with the help of **Nested If Statements**



Conclusion

- When a task needs to be performed on the base of multiple conditions, a chain of IF blocks (**nested IF blocks**) may be used.
- If the condition of the **parent** if block is **true**, the nested block condition shall be checked and **if it is also true**, only then the task will be performed. In this way nested blocks allow a program to **check multiple conditions**.



Self Assessment

After execution of the following code, what is stored in the number? (All variables are of type int.)

Hint: use $x=3$, $y=5$, and $z=7$ as sample values.

```
if (y > z) {  
  if (x > y)  
    number = x;  
  else  
    number = y;  
}  
else {  
  if (x > z)  
    number = x;  
  else  
    number = z;  
}
```

- a. the smallest value of x , y , and z
- b. the largest value of x , y , and z
- c. smaller of x and y
- d. larger of x and z
- e. randomly selected value from x , y , and z



Self Assessment

Solve Following Programs

1. Take the age and name of three brothers as input and display the younger brother's name.
2. Write a program that asks the user to input three different values and then find out the largest using nested if.

