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         else{
15             cout << "Not Largest" << endl;}
16     }
17     else{
18         cout << "Not Largest" << endl;}
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         else{
15             cout << "Not Largest" << endl;}
16     }
17     else{
18         cout << "Not Largest" << endl;}
19 }
```

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

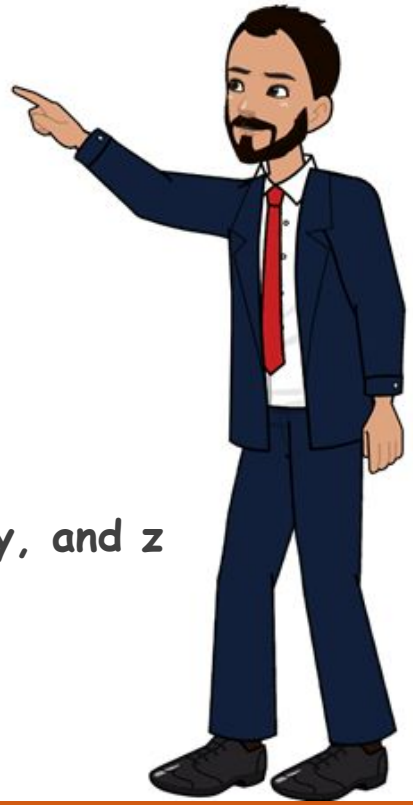
- When a task needs to be performed on the base of multiple conditions, a chain of IF blocks (nested IF blocks) may be used.
- If the condition of the parent if block is true, the nested block condition shall be checked and if it is also true, only then the task will be performed. In this way nested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