

CS 161C++

Nested If Statements

Sometimes you want to make a more complex decision than is possible with a simple if/else statement. Often this can be done with multiple if/else statements in a row, using some complex logical expression, but often it is simpler to nest the if/else statements instead.

Nested If/Else Statement

The general form of a nested if/else statement is:

```
if ( logical expression1 )
{
    if ( logical expression 2 )
    {
        C++ statement group 1
    }
    else
    {
        C++ statement group 2
    }
}
else
{
    if ( logical expression 3 )
    {
        C++ statement group 3
    }
    else
    {
        C++ statement group 4
    }
}
```

First, the computer evaluates logical expression 1. If this expression is true, then it evaluates logical expression 2. If both 1 and 2 are true, then statement group 1 is executed. If expression 1 is true and expression 2 is not true, then the computer executes statement group 2.

If logical expression 1 is false, the computer then looks at logical expression 3. If 3 is true and 1 is false, then statement group 3 is executed. If 3 is false and 1 is false, then statement group 4 is executed.

You could write this same logic using compound expressions as follows:

```
If ( logical expression 1 and logical expression 2 )  
    C++ group 1;  
  
If ( logical expression 1 and not logical expression 2 )  
    C++ group 2;  
  
If ( not logical expression 1 and logical expression 3 )  
    C++ group 3;  
  
If ( not logical expression 1 and not logical expression 3 )  
    C++ group 4;
```

The advantage of the nesting is that it is easier to see the logic. Also, you can go to a deeper depth of nesting – using another replacing some of the statements above.

An example is the insurance program in Moodle.

Series If/Else Statements

Sometimes you want to select a chance between multiple options. Using a series of if/else statements helps in this situation. If the first one is not true, then you look at the second, and so on. The advantage of this construction is that you are able to have a none-of-the-above choice.

The general format is:

```
if ( choice 1 )  
    statement group 1  
  
else  
    if ( choice 2 )  
        statement group 2  
  
    else  
        if ( choice 3 )  
            statement group 3  
        else  
            none of the above ...
```

An example is the letters to words example in Moodle.