

[0403] Complex If/Else Statements Considered Harmful!

Back in 1970, a famous Computer Scientist named Edsger Dijkstra wrote a famous letter to a famous industry journal, "Communications of the ACM." The title of that letter was "GO TO Statement Considered Harmful" and it was possible the first meme ever. Since then, whenever a computer geek finds something that seems cool at first but, if misused, can become a big problem, they say "_____ considered harmful!" and chuckle at their cleverness.

https://en.wikipedia.org/wiki/Considered_harmful [_\(https://en.wikipedia.org/wiki/Considered_harmful\)](https://en.wikipedia.org/wiki/Considered_harmful)



Edsger Dijkstra - *"GOTO's worst enemy"*

(Prior to Dijkstra's letter, people were using GOTO statements everywhere and creating tons of bugs because the resulting "spaghetti code" was impossible to understand. Dijkstra's letter marked the start of the Structured Programming movement.)

Anyway... if I was to write a similar letter today, it would be entitled "Complex If/Then/Else Statements Considered Harmful" and it would have lots of statistics showing that the more IF/THEN/ELSE statements a program has - especially if they are nested - the more buggy the program is. It would also show how, over time, programs sprout new IF/THEN/ELSE statements at a dangerous rate as bug fixes are applied to the original code by programmers that don't understand the program's original design.

Want an example? Try this mind-bender on for size:

```
if (count < 0)
{
    Console.WriteLine("Invalid input.");
}
else if (count < 15)
{
    Console.WriteLine("Too short.");
}
else if (count > 15)
{
    if (freeSpace <= 0)
    {
        Console.WriteLine("Not enough space.");
    }
    if (freeSpace >= 0)
    {
        Console.WriteLine("Looking good!");
    }
}
else if (count < 100)
{
    if (freeSpace < 0)
    {
        Console.WriteLine("Not enough space.");
    }
    else if (freeSpace > 0)
    {
        Console.WriteLine("Looking good!");
    }
} else
{
    Console.WriteLine("Something broke!");
}
}
```

There are numerous bugs in this code snippet. How many do you see?

Question: Under what conditions would "Something broke!" be printed by itself?

The bottom line: Complex If/Then/Else logic kills! You've been warned...