De Morgan's Law

Suppose that you need to test a set conditions to see if they are all **not** true. For example, you want to go to work **if** it is **not** Saturday, Sunday, or a Holiday. The code to make this test might look something like

```
  if ( ! (today == "Sunday" || today == "Saturday" ||
today == "Holiday") )
       Console.WriteLine("Go to Work!");
```

Sometimes the use of the `not` operator can be confusing when applied to `and` and `or` conditions like this. The British Mathemetician Augustus De Morgan (1806 - 1871) developed a scheme for simplifying expressions that use the `not` operator. *De Morgan's Law* has two forms:

```
    ! ( A && B)     is the same as (!A || !B)
    ! ( A || B)     is the same as (!A && !B)
```

Also note that you can simplify the expression

```
! ( A == B)
```

by bringing the ! inside of the parentheses and writing

```
( A != B)
```

So, in the formulation of our code, we could equally as well have written

```
   if ((today != "Sunday" && today != "Saturday" &&
today != "Holiday") )
       Console.WriteLine("Go to Work!");
```