

Suppose we have constraints: "Either $g(x) \leq 0$ or $h(x) \leq 0$ ". We can model this situation equivalently as:

$$\begin{cases} g(x) \leq my \\ h(x) \leq m(1-y) \\ y \in \{0, 1\} \end{cases}$$

Notice that when $y=0$: $g(x) \leq 0$ and $h(x) \leq m$
and when $y=1$: $g(x) \leq m$ and $h(x) \leq 0$.

So, if we choose M large enough so that $h(x) \leq m$ and $g(x) \leq m$ for all possible values of x , then we have successfully modeled an either/or constraint.

Suppose we have constraints: "If $g(x) > 0$ then $h(x) \leq 0$ ".

Notice that this is equivalent to "Either $g(x) \leq 0$ or $h(x) \leq 0$ ".
And, this is the situation described above.

Extra Credit: Model the constraints:

"At least one of $g_k(x) \leq 0$, $k=1, 2, \dots, n$, must be satisfied."