1 Problem

We want to typeset Linear Programs, with their objective functions and constraints. Typically, the objective function is quite broad, and the constraints are relatively narrow. Even with very wide domain constraints, the constraint and its domain constraint should typically fit on one line. The examples below demonstrate two ways of doing this, both with their downsides. They start off with the verbatim $\mathcal{A}\mathcal{M}\mathcal{S}$-LaTeX code used and then show the result.

2 *With* the `tag` trick

```
Using this code, the domain constraint ($\forall j\in(P\cap\mathcal{A}$) is
displayed nicely, close to the equation number.  However, the references are
messed up, in that you want \lstinline!\ref{allonce}! to show up as ''2'',
but instead it shows up as ''\ref{allonce}''.
\begin{align}
\text{minimize}\quad&
    \sum_{i\in I}\sum_{j\in (P\cap \mathcal{A})} x_{ij}y_j
  - \sum_i\sum_j k_iy_j
  + N\cdot\sum_ik_i\\
\text{subject to}\quad&
    \sum_i x_{ij} = 1
    \stepcounter{equation}
    \tag*{$\forall j\in (P\cap \mathcal{A}) | j \geq \zeta$
      \ (\theequation)}
    \label{allonce}
\end{align}
```

Using this code, the domain constraint ($\forall j \in (P \cap \mathcal{A})$ is displayed nicely, close to the equation number. However, the references are messed up, in that you want `\ref{allonce}` to show up as "2", but instead it shows up as "$\forall j \in (P \cap \mathcal{A})|j \geq \zeta \quad (2)$".

$$\text{minimize} \quad \sum_{i\in I}\sum_{j\in (P\cap \mathcal{A})} x_{ij}y_j - \sum_i\sum_j k_iy_j + N\cdot\sum_ik_i \tag{1}$$

$$\text{subject to} \quad \sum_i x_{ij} = 1 \qquad \forall j\in (P\cap \mathcal{A}) | j \geq \zeta \ (2)$$

3 *Without* the `tag` trick

```
When we use the normal way of adding columns, i.e.\ with \&\&, the large
objective function in the first line may not overlap with the columns of the
domain constraint, but the references work fine, as in ''\ref{alloneX}.''
\begin{align}
```

```
\text{minimize}\quad&
    \sum_{i\in I}\sum_{j\in (P\cap \mathcal{A})} x_{ij}y_j
  - \sum_i\sum_j k_iy_j
  + N\cdot\sum_ik_i\\
\text{subject to}\quad&
    \sum_i x_{ij} = 1&&
    \forall j\in (P\cap \mathcal{A} | j \geq \zeta)
    \label{alloneX}
\end{align}
```

When we use the normal way of adding columns, i.e. with &&, the large objective function in the first line may not overlap with the columns of the domain constraint, but the references work fine, as in “4.”

$$\text{minimize}\quad \sum_{i\in I}\sum_{j\in (P\cap \mathcal{A})} x_{ij}y_j - \sum_i\sum_j k_iy_j + N\cdot\sum_ik_i \tag{3}$$

$$\text{subject to}\quad \sum_i x_{ij} = 1 \qquad \forall j\in (P\cap \mathcal{A}) | j \geq \zeta) \tag{4}$$