Complex AVL Tree Deletion Example

- Original AVL tree:

```
\begin{itemize}
  \item External nodes have height 0; internal nodes have height labelled in \textcolor{red}{red} to their left
  \item Original AVL tree is indeed balanced
  \item Say we had the above tree, and want to delete key 20
  \item To delete key 20:
    \begin{itemize}
      \item Move key 25 up to where key 20 is
      \item Delete the node that used to contain 25
    \end{itemize}
\end{itemize}
```
Next Step

- Now the tree is unbalanced at the node containing 25
  - Left subtree has height 2
  - Right subtree (just one external node) has height 0

- Must restructure
Next Step

- Now the tree is unbalanced at the root (the node containing 30)
  - Left subtree has height 2
  - Right subtree has height 4
- Must restructure again
Last Step

- Balanced