
To find a maximum-weight independent set of a tree T :

Root the tree at a node r

For all nodes u of T in post-order

If u is a leaf then set the values:

$$M_{out}[u] = 0$$

$$M_{in}[u] = w_u$$

Else set the values:

$$M_{out}[u] = \sum_{v \in children(u)} \max(M_{out}[v], M_{in}[v])$$

$$M_{in}[u] = w_u + \sum_{v \in children(u)} M_{out}[v].$$

Endif

Endfor

Return $\max(M_{out}[r], M_{in}[r])$
