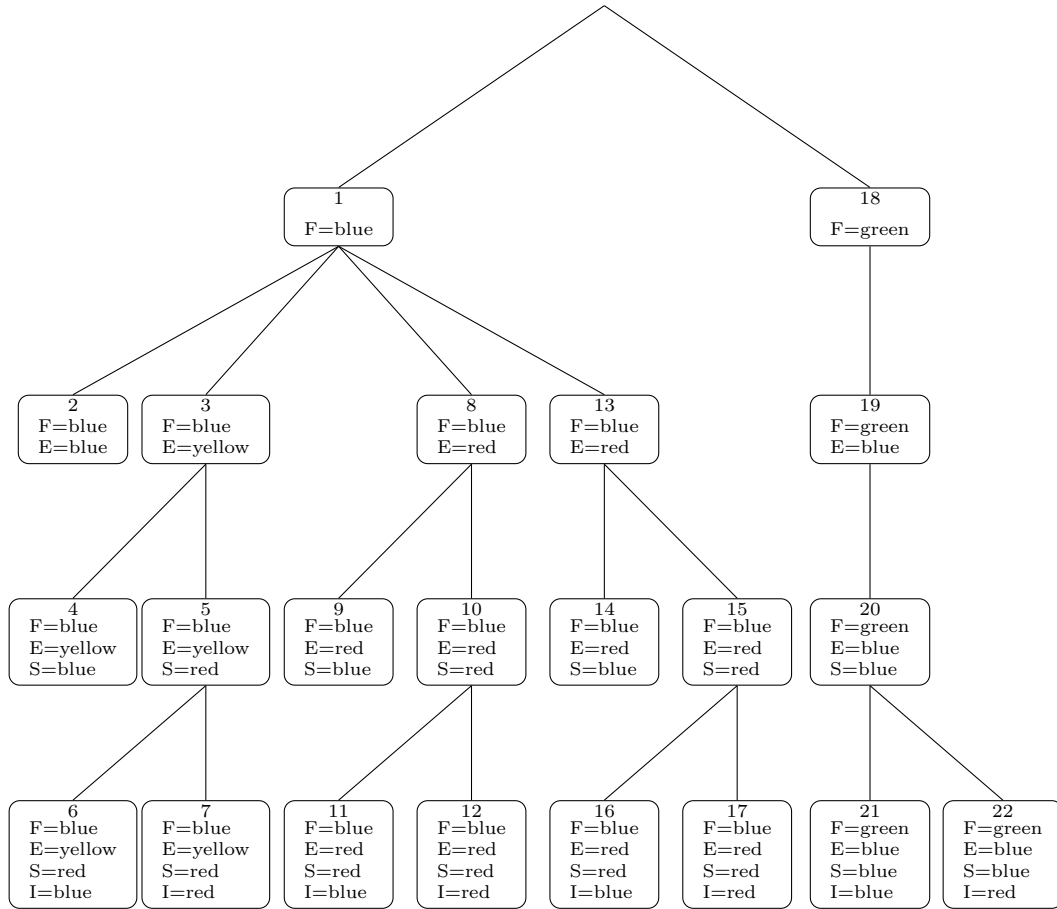


IA Solutions 3: Constraint Satisfaction

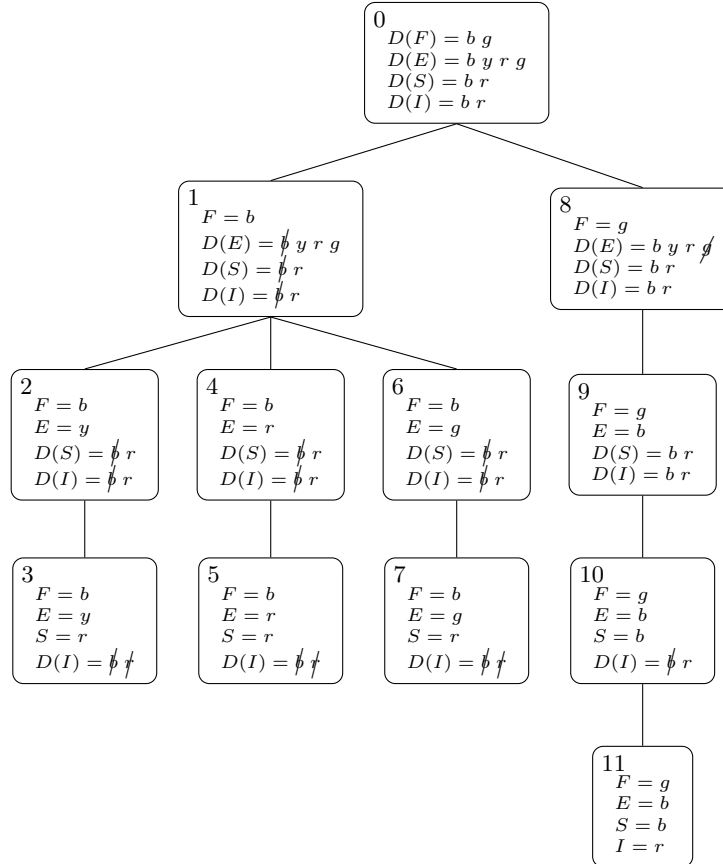
Exercise 1

The algorithm effectively performs a depth first search, backtracking when the constraints are violated.



Exercise 2

We write $D(n)$ for the possible values for a variable n . Arc consistency from n to n' is satisfied if $\forall v \in D(n), \exists v' \in D(n')$ such that $n = v$ and $n' = v'$ is consistent. If there is no such v' , we remove v from $D(n)$. If after doing this $D(n)$ is empty, the search down this branch has failed.



Exercise 3

If we apply all the heuristics at once, this finds the solution directly: F, S and I have minimal sets of possible variables, and out of these F can constrain the most other variables. We assign green to F first as this only constrains E, whereas blue constrains S and I. The next node to assign is either S or I, to either blue or red. The final two variables may be assigned any of their remaining colours.