19/20 Mid Term, Part III, Q2

Claim: Step 1(a) does not ensure that $X_2, \cdots, X_n$ is a tree-structured CSP, thus you cannot run the tree-structured algo on it.

Let $i, j \in \{1, 2, 3, 4\}$, $D_{X_i} = \{0, 1\}$, Constraints $:= \langle (X_i, X_j), X_i \neq X_j \rangle$.

Set $X_1 = 0$. Running forward checking will cause $D_{x2} = \{1\}$. Since none of the domains are empty, the solution proceeds to run the algorithm for tree-structured CSPs, when the CSP is not a tree.