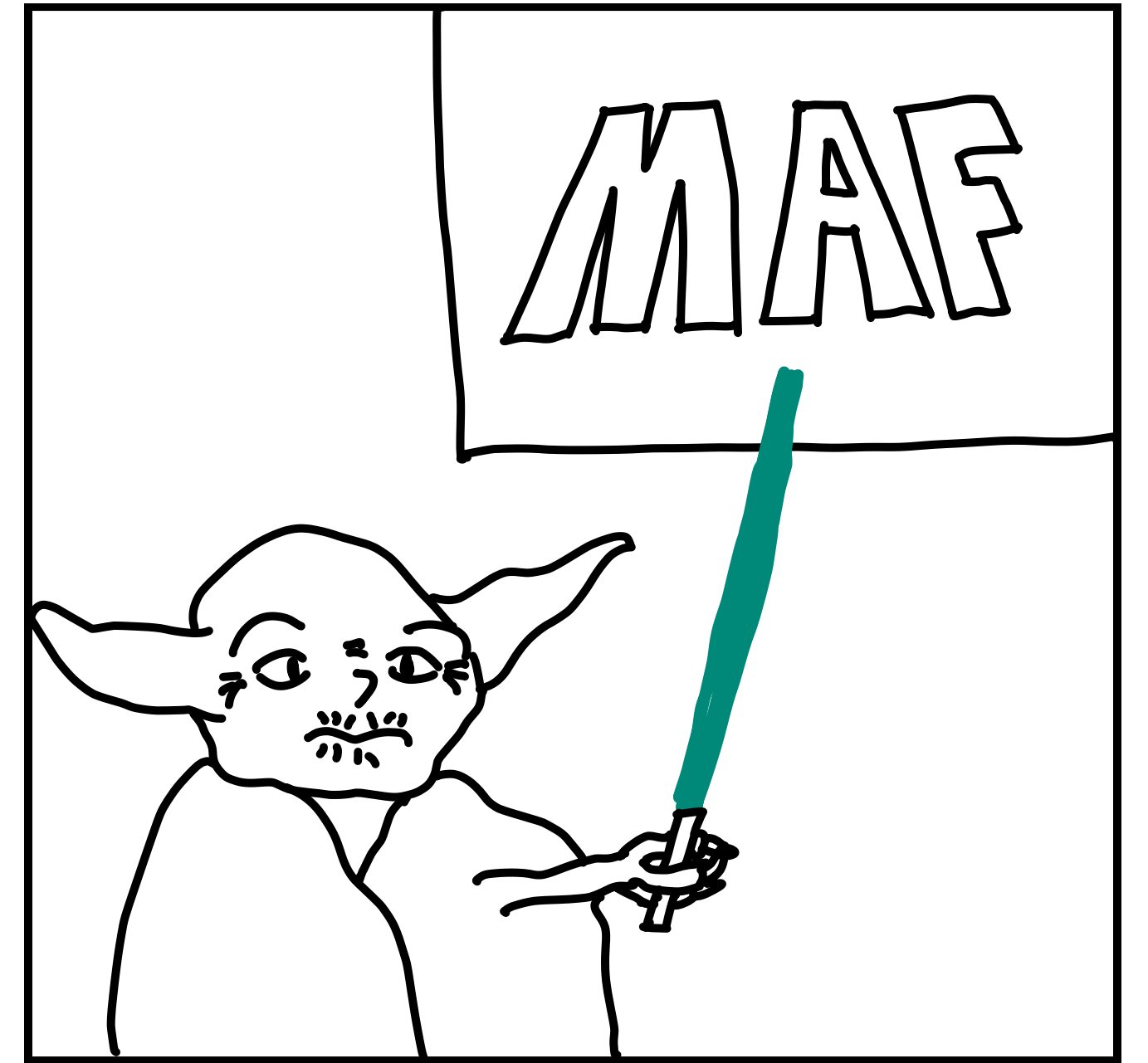
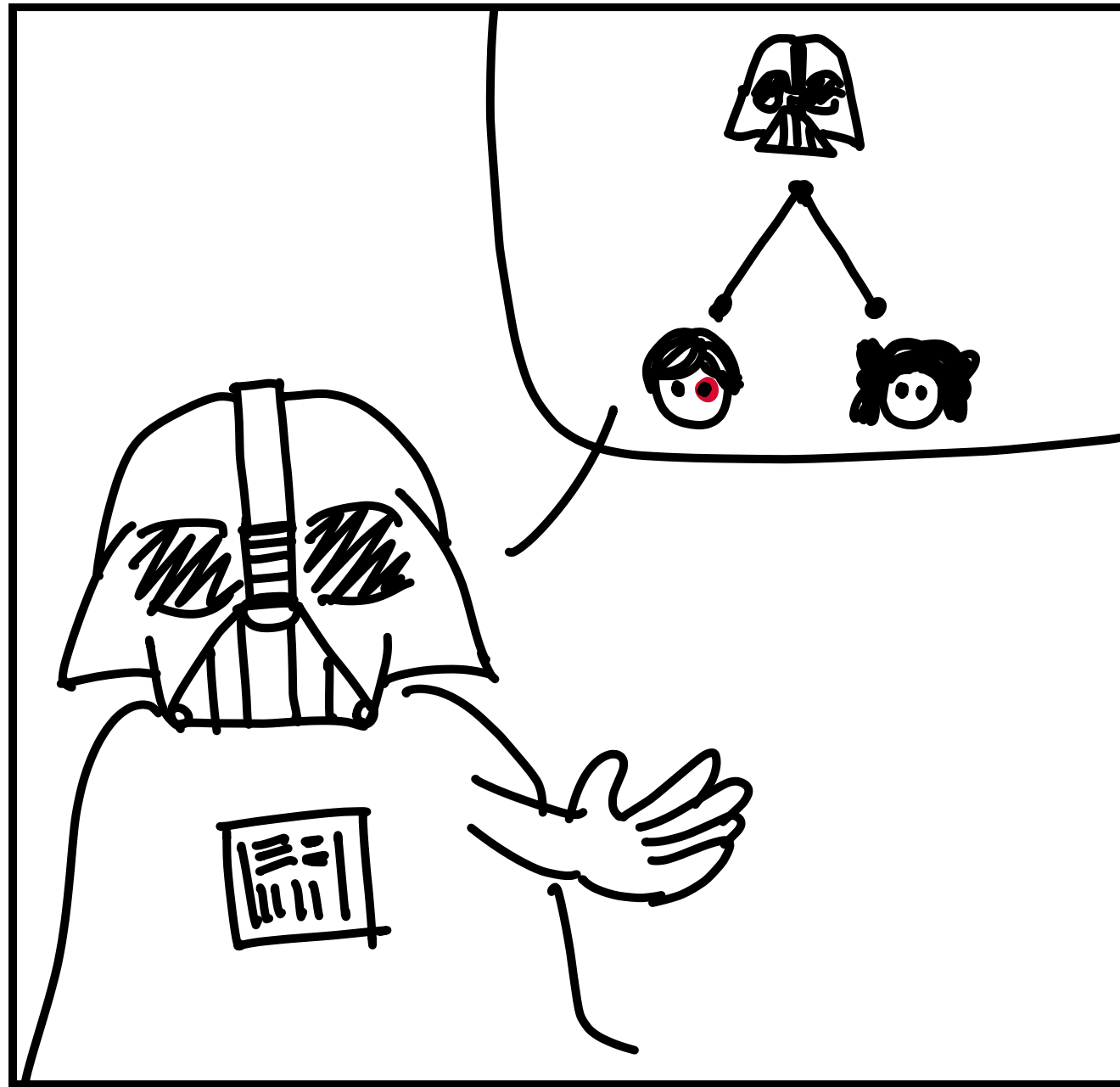




Computing Maximum Agreement Forests

PACE Challenge 2026

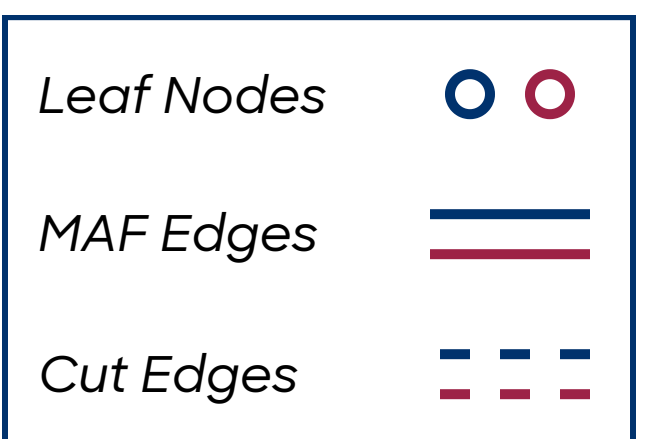
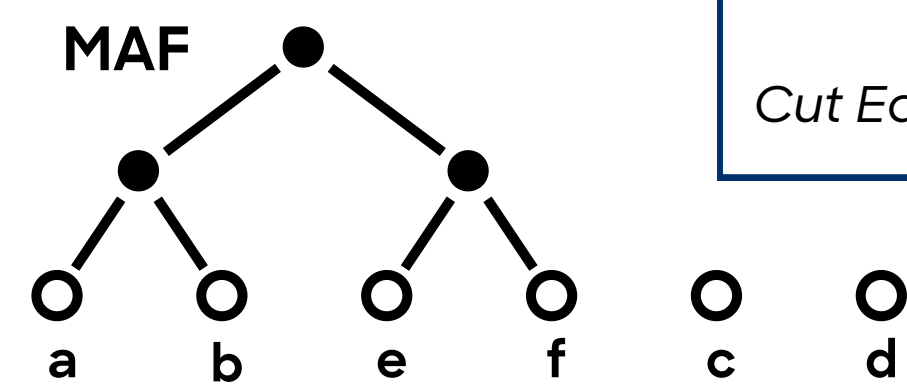
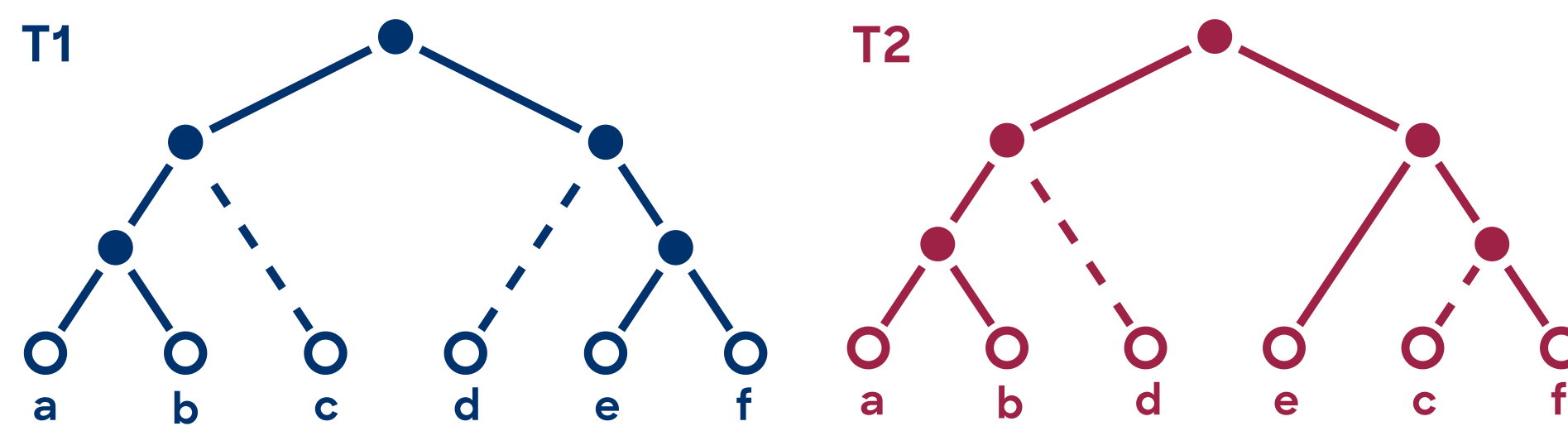


Maximum Agreement Forest (MAF)

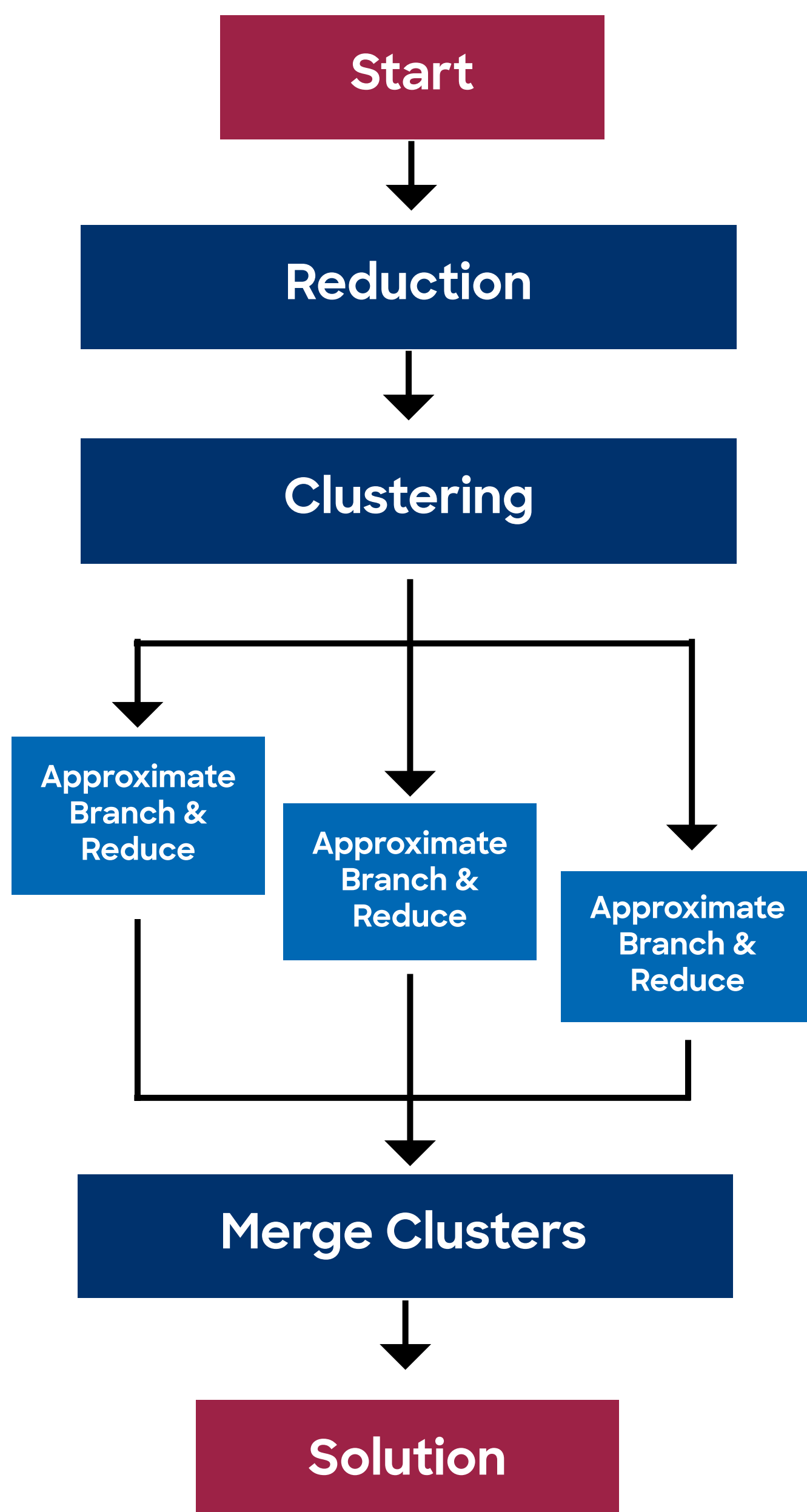
Minimum number of edge cuts k required so that remaining trees are structurally identical.

This Problem is NP-hard with $O(3^{nt})$ where n = leaves and t = trees.

Mainly used in *phylogenetics*.

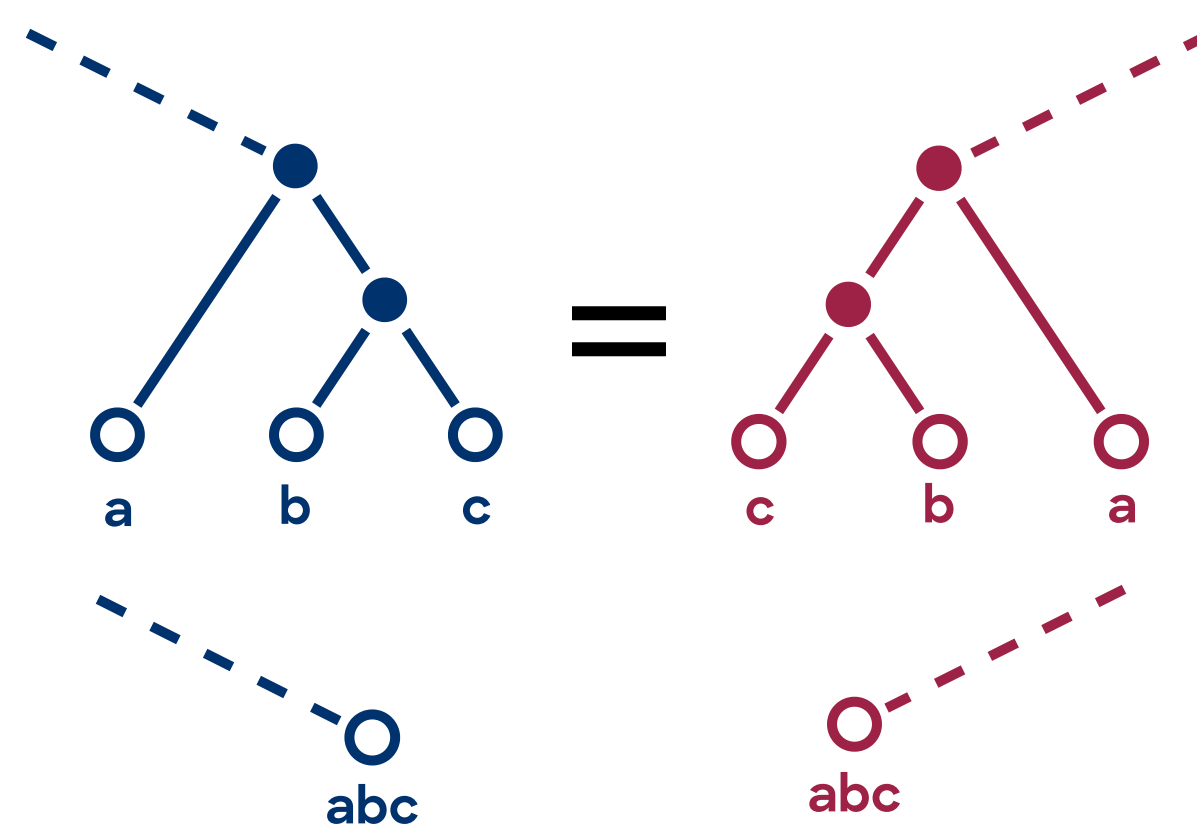


Algorithm Outline



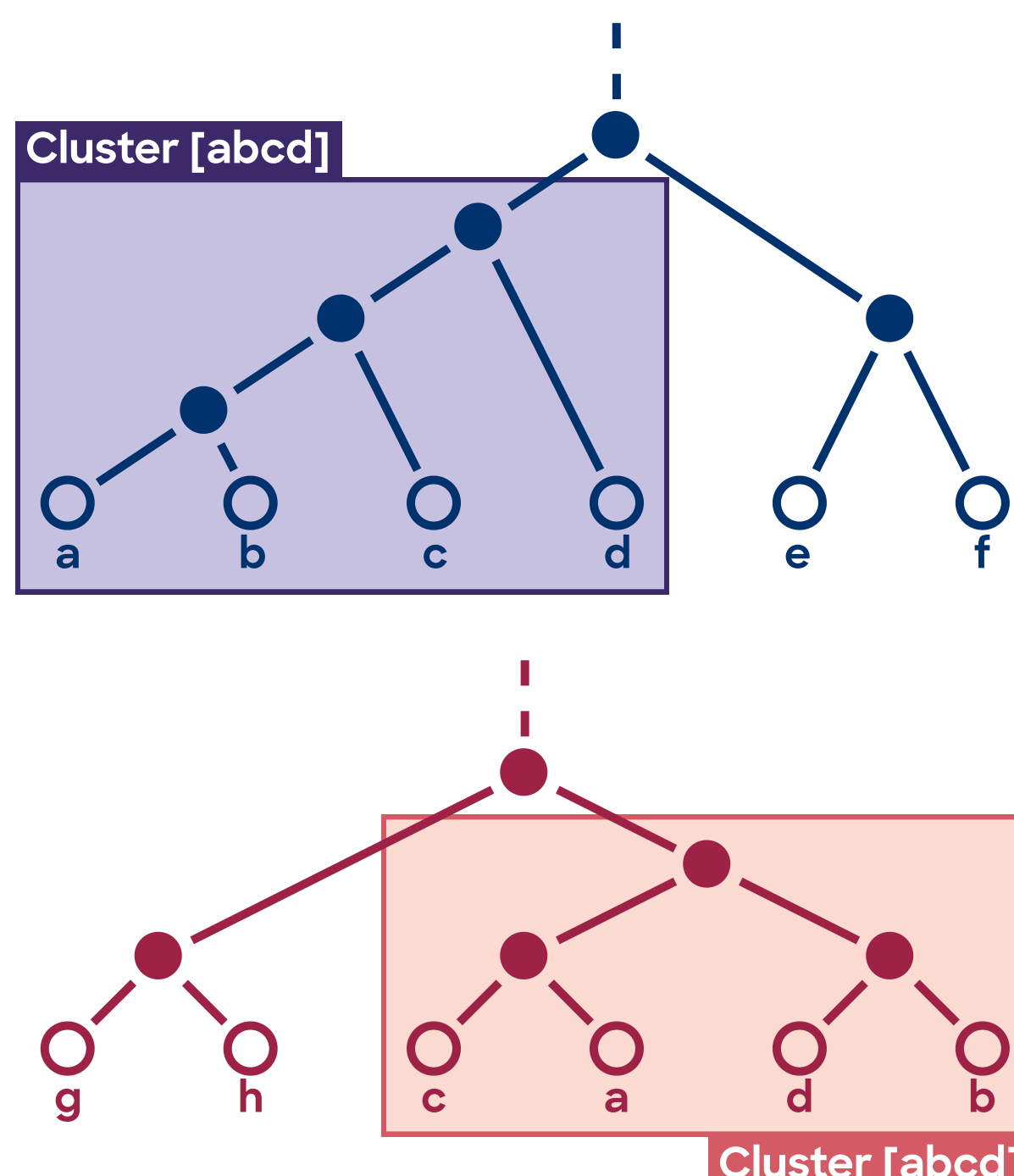
Reduction

Transform repeating structures across trees into combined nodes

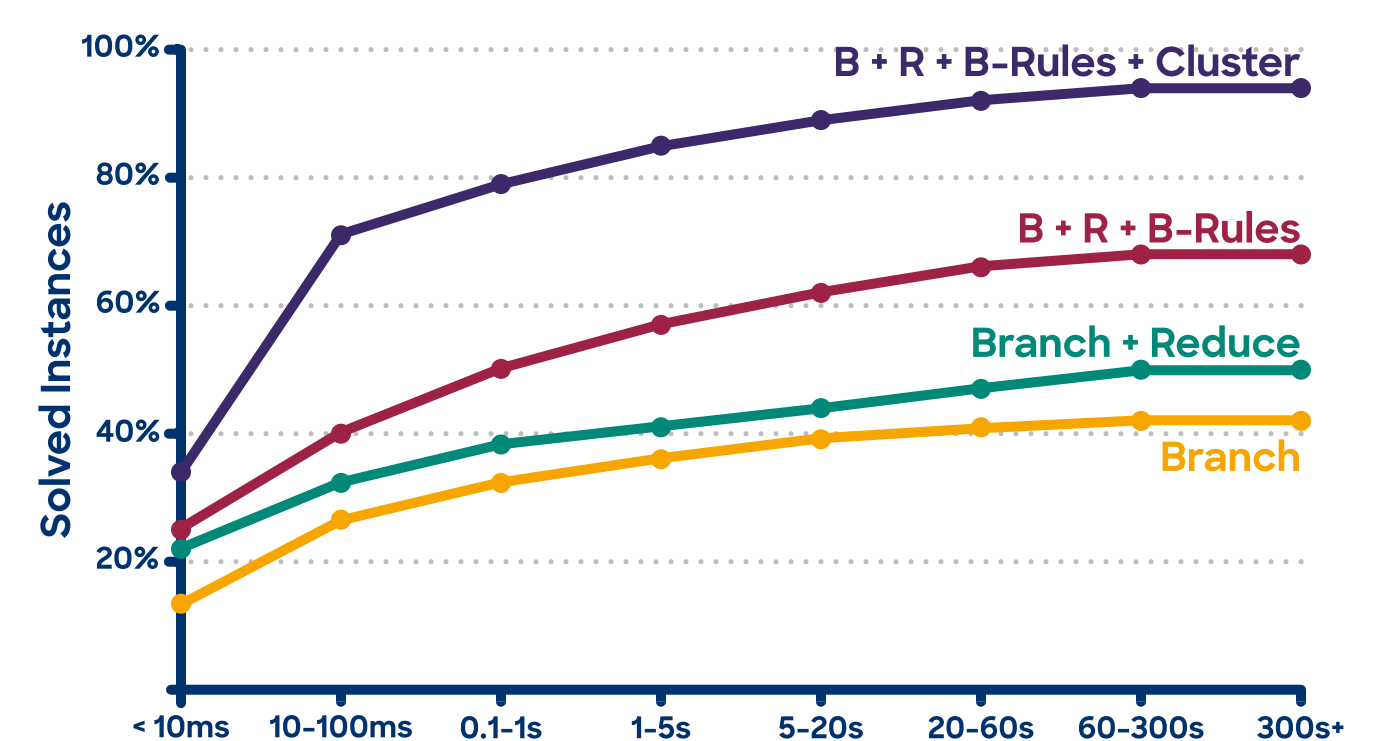


Clustering

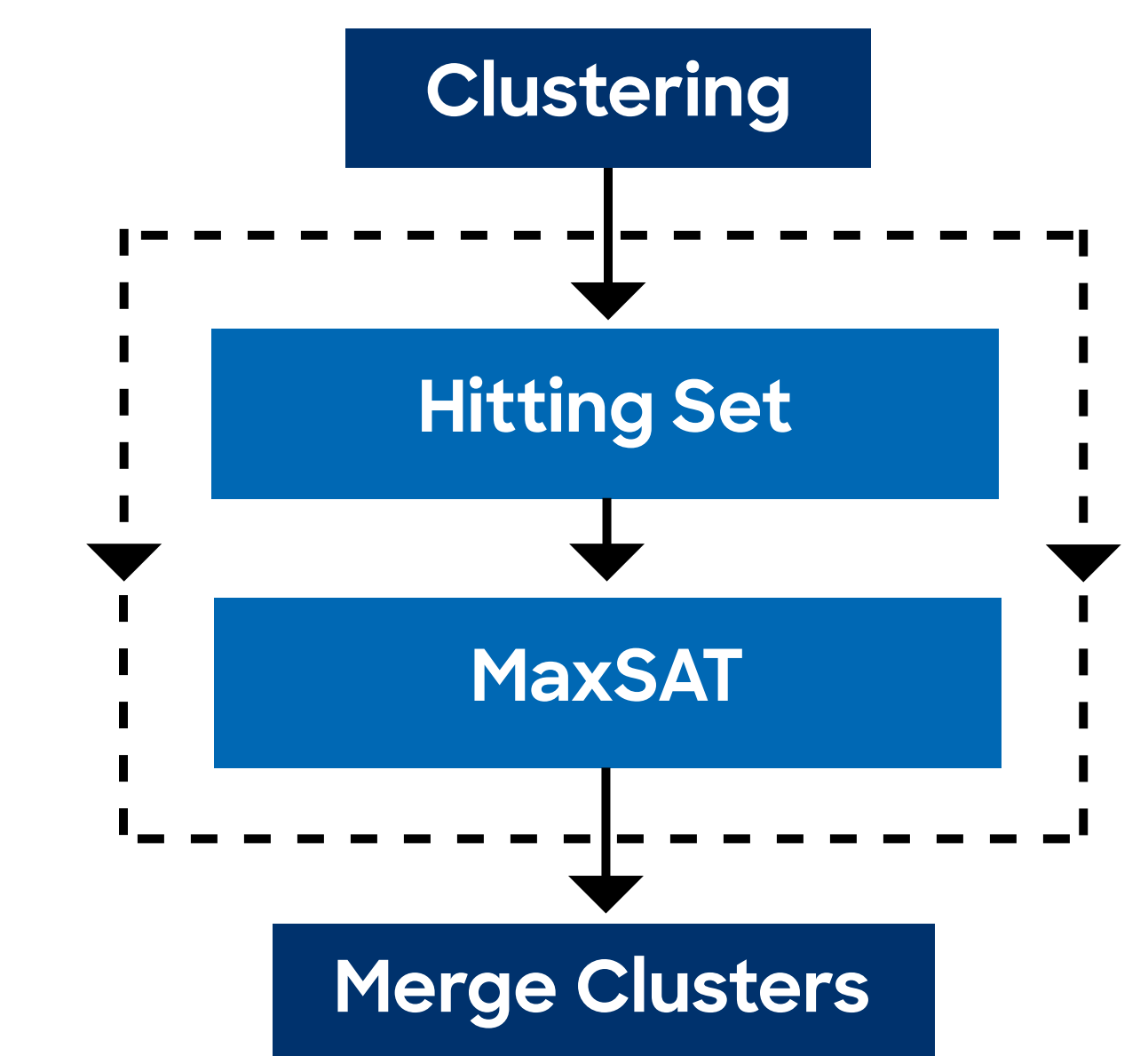
Subdivide tree and solve subtrees individually



Effectiveness



Branching Alternative: MaxSAT



References

- C. Whidden, R. G. Beiko, N. Zeh (2013). Fixed-Parameter Algorithms for Maximum Agreement Forests. SIAM J. Comput. 42(4)
- S. Kelk, S. Linz, R. Meuwese (2023). Cyclic generators and an improved linear kernel for the rooted subtree prune and regraft distance, Information Processing Letters, Volume 180