

Algorithms in Comparative Genomics

Bielefeld University, WS 2019/20

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<https://gi.cebitec.uni-bielefeld.de/teaching/2019winter/cg>

Exercise sheet 10, 19.12.2019

Exercise 1 (Common intervals from generators)

Consider permutation (4 3 2 1 5 6 7) from Exercise 2 from the previous exercise sheet. We determined the generator (Sup, Inf), where:

$$Sup = [7, 4, 4, 4, 7, 7, 7]$$

$$Inf = [1, 1, 1, 1, 1, 1, 1].$$

1. Determine *Support* for Sup .
2. Compute the common intervals using Sup following Algorithm 4 in: Bergeron et al. "Computing common intervals of K permutations with applications to modular decomposition of graphs", SIAM J. Discrete Math., 2008.

Exercise 2 (Common intervals and PQ-trees)

Consider the set $\{Id_9, P_1, P_2, P_3\}$ of permutations on 1 through 9, where

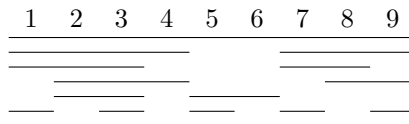
$$Id_9 = (1, 2, 3, 4, 5, 6, 7, 8, 9),$$

$$P_1 = (9, 8, 7, 5, 6, 4, 3, 2, 1),$$

$$P_2 = (6, 5, 7, 8, 9, 1, 2, 3, 4),$$

$$P_3 = (1, 3, 2, 4, 5, 6, 9, 8, 7).$$

The following graphical representation shows all their common intervals.



1. Identify all strong common intervals.
2. Construct the corresponding PQ-tree.