

Algorithms in Genome Research
Winter 2005/2006

Exercises

Sheet 10, Discussion: 02.02.2006

1. Given two signed permutations (genomes)

$$A = 0 \ 1 \ 2 \ 3 \ 4 \ 5 \ 6 \ 7 \ 8 \ 9 \ 10 \ 11 \ 12 \ 13 \ 14 \ 15 \ 16$$

and

$$B = 0 \ -3 \ 1 \ 2 \ 4 \ 6 \ 5 \ 7 \ -15 \ -13 \ -14 \ -12 \ -10 \ -11 \ -9 \ 8 \ 16.$$

- (a) What is the breakpoint distance between A and B ?
 - (b) Find the elementary intervals and the cycles of permutation B .
 - (c) Find the components of permutation B .
 - (d) Draw the tree T_B .
 - (e) What is the inversion distance between A and B ?
2. Obviously there exist bijective mappings between the numbers $1, 2, \dots, n!$ and the permutations over $\{1, 2, \dots, n\}$. Find such a mapping that is computable in both directions in polynomial time.