Algorithms for Bioinformatics (Autumn 2015)

Exercise 5 (Tue 6.10., 10-12, B222)

If you cannot make it to the exercise session, please e-mail your solutions and the reason why you cannot attend to daniel.valenzuela@cs.helsinki.fi before the exercise session to get credit.

Some of the problems below are programming exercises on the Rosalind platform at http://rosalind.info/problems/list-view/?location=bioinformatics-textbook-track


2. Solve the Rosalind problem BA6B: Compute the Number of Breakpoints in a Permutation.

3. Prove that if a signed permutation $P$ contains negative signs, there is always a reversal that decreases Breakpoints($P$).

4. Perform the breakpoint reversal sort algorithm with $P = (+3 +4 -6 -5 +7 +1 -8 -2)$ as the input and show all intermediate permutations. Is this the optimal solution to this instance of reversal sorting problem?

5. Compute the 2-break distance $d(P, Q)$ for $P = (+a +b +c +d +e +f +g +h)$ and $Q = (+c +d -f -e +g +a -h -b)$. Show the breakpoint graph Breakpoint($P, Q$).