Exercises – Algorithms for Genome Rearrangement

Universität Bielefeld, SS 2015, Dr. Pedro Feijao, B. Sc. Kevin Lamkiewicz

http://wiki.techfak.uni-bielefeld.de/gi/Teaching/2015summer/gr

Exercise List 9 — 15.06.2015

Discussion of exercises on: 29.06.2015

Exercise 1 *Component recombination* **(3 Points)**

Given two linear genomes $A = (-1, -2)$ and $B = (1, 2)$;

(a) Draw the Adjacency graph $AG(A, B)$

(b) How many different ways of transforming A into B can you find? What happens with the components of $AG(A, B)$ in each way?

Exercise 2 *DCJ InDel* **(6 Points)**

Consider the linear genomes $A = (1, a, -2, b, 3)$ and $B = (1, c, 2, d, 3)$.

(a) Draw the adjacency graph $AG(A, B)$. What is the DCJ InDel distance between A and B?

(b) Find a scenario with 3 Indels, applying only optimal DCJs. Redraw the AG graph after the first DCJ.

(c) Find a scenario with 2 Indels. Redraw the AG graph after the first DCJ. *Tip: find a neutral DCJ that reduces the number of runs.*