

Phylogenetics Z620 Homework 3

Consider the problem of using data from genetic crosses to place 5 genes (called A, B, C, D, and E) in their proper order. Note that the order AB is indistinguishable from the order BA – you can't tell which gene is "first" and which gene is "last"; that is, if you reverse any ordering of all 5 genes you have the same ordering.

- 1) Determine a tree that you could traverse to get to all possible orderings of these 5 genes.
- 2) If the function we were trying to minimize was the total number of recombinations needed to explain a given dataset (as determined by a genetic cross) with a given gene ordering, give criteria that could be used to bound and stop the search for the optimal ordering. (You don't have to rack your brain for the best possible criteria here, just come up with some reasonable criteria.)