

Algorithms in Genome Research
Winter 2013/2014

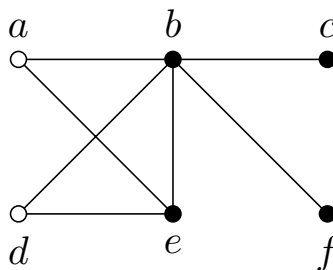
Exercises

Number 2, Discussion: 2013 November 15

1. Given the signed permutation

$$\pi = [+2 \ +4 \ +3 \ +5 \ +1 \ +6 \ -7]$$

- (a) How many components does the graph $BP(\pi)$ has, and of which type?
(b) What is the inversion distance?
(c) Find a sequence of inversions that sort the permutation.
2. Suppose that a given permutation has the following overlap graph:



- (a) What is the vertex with maximum score? Apply the reversal defined by this vertex, update the overlap graph, and repeat the process until the permutation is sorted.
(b) Can you find a breakpoint graph that has the overlap graph in the figure?
3. The number of possible (unsigned) permutations over $\{1, 2, \dots, n\}$ is $n!$. Obviously, there exist bijective mappings between the numbers $1, 2, \dots, n!$ and permutations over $\{1, 2, \dots, n\}$. Find such a mapping that is computable in both directions in polynomial time.