

Homework 6

Due: 5:00pm, April 25, 2008

Total Points: 40

1. (5 points) Show the minimum spanning tree resulting from executing Kruskal's algorithm on the graph in Figure 9.82. When considering edges in order by increasing weight, if two edges have the same weight, consider first the one with the lowest vertex (alphabetically).
2. (5 points) Show the minimum spanning tree resulting from executing Prim's algorithm on the graph in Figure 9.82. Start with vertex A, and when considering among equal-weight edges to add, choose the one that adds the lowest vertex (alphabetically).
3. (5 points) Exercise 9.20.
4. (6 points) Exercise 9.21. Start at vertex A, and when considering adjacent vertices to visit next, visit them in alphabetical order.
5. (6 points) Exercise 9.26. Also show the reverse graph G_r (as in Figure 9.76) with the post-order traversal numbers. Start at vertex A, and when considering adjacent vertices to visit next, visit them in alphabetical order.
6. (5 points) Exercise 9.39. You may assume the vertex class has a color field. You do not need any other special data structures. Be sure to explain why your algorithm runs in linear time.
7. (8 points) Exercise 9.55. You do not need to prove NP-completeness. Just describe the reduction algorithm in each case and explain why it takes polynomial time.