

Comp5048

Semester 2, 2010

Homework 2

1. ** Write down a full description of the basic Reingold-Tilford tree drawing algorithm for binary trees.
2. * Show that the Reingold-Tilford tree drawing algorithm for binary trees runs in linear time.
3. Write down the four most important properties of the Reingold-Tilford tree drawing algorithm.
4. Find a link to an open-source encoding of the Reingold-Tilford tree drawing algorithm.
5. *** Write down a variation of the basic Reingold-Tilford tree drawing algorithm that handles nodes with a given height and width.
6. Write down a full description of a radial tree drawing algorithm that ensures that the result has no edge crossings. Include a method for choosing a root. What is the time complexity of your algorithm?
7. Write down a greedy HV tree drawing algorithm that attempts to minimise height for a given width. You can assume that each node is a unit square. What is the time complexity of your algorithm? Show that your algorithm does not always give an optimal solution.
8. Write down an exhaustive search HV tree drawing algorithm that minimises height for a given width. You can assume that each node is a unit square. What is the time complexity of your algorithm?
9. * Write down an efficient HV tree drawing algorithm that minimises height for a given width. You can assume that each node is a unit square. Show that the time complexity of your algorithm is $O(n^2)$.
10. **** Write down a full description of a tip-over tree drawing algorithm for binary trees. Your algorithm should work on trees with a character string in each node. What is the time complexity of your algorithm?