Homework 3*

CS 719, Semester II, 1996-97

Friday February 7, 1997

1. Give a five-node network for which a breadth-first traversal examines the nodes in the same order as a depth-first traversal.

2. Show that in a breadth-first search tree, the tree path from the source node to any node i is a shortest path (i.e. contains the fewest number of arcs among all paths joining these two nodes). Hint: use induction on the number of labeled nodes.

3. Show that a depth-first order of a network satisfies the following properties.

    (a) If node j is a descendant of node i, $order(j) > order(i)$.

    (b) All the descendants of any node are ordered consecutively in the order sequence.

---

*Homework due in class one week after assigned. No late homework accepted.