Homework #4

Due: November 10 (before class)

Exercise 9.6.1: For the flow graph of Fig. 9.10 (see the exercises for Section 9.1):

    i. Compute the dominator relation.

    ii. Find the immediate dominator of each node.

    iii. Construct the dominator tree.

    iv. Find one depth-first ordering for the flow graph.

    v. Indicate the advancing, retreating, cross, and tree edges for your answer to *iv*.

    vi. Is the flow graph reducible?

    vii. Compute the depth of the flow graph.

    viii. Find the natural loops of the flow graph.

! Exercise 9.6.6: A *complete flow graph* on n nodes has arcs $i \rightarrow j$ between any two nodes i and j (in both directions). For what values of n is this graph reducible?

! Exercise 9.6.7: A *complete, acyclic flow graph* on n nodes $1, 2, \ldots, n$ has arcs $i \rightarrow j$ for all nodes i and j such that $i < j$. Node 1 is the entry.

    a) For what values of n is this graph reducible?

    b) Does your answer to (a) change if you add self-loops $i \rightarrow i$ for all nodes i?