

## Optimising Compilers: Exercises 1

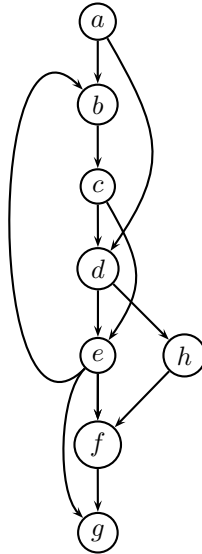


Figure 1: Control flow graph.

1. Find the dominance relation of the control flow graph above using the iterative algorithm.
2. Perform a depth-first search on the control flow graph above. Show the depth-first search tree.
3. What is the definition of a semidominator?
4. Find the dominator tree using the Lengauer-Tarjan algorithm.
5. How can you use the dominator tree to determine whether vertex  $u$  dominates vertex  $v$ ?
6. Perform a depth-first search on the dominator tree and assign depth-first search numbers to the vertices. Also count the number of descendants (not including itself) each vertex has. How can you use this information to solve the preceding exercise in a faster way?