

Compiler Construction WS09/10

Exercise Sheet 9

Please hand in the solutions to the theoretical exercises until the beginning of the lecture next Wednesday 2010-01-13, 10:00. Please write the number of your tutorial group or the name of your tutor on the first sheet of your solution. Solutions submitted later will not be accepted.

Exercise 9.1: Global Variable Numbering (Points: 3)

Reconsider the global variable numbering. How is congruence initialized for the ϕ s?

Hint: Refer to Section 2.5 of Alpern, Wegman, Zadeck: *Detecting equality of variables in programs*.

Exercise 9.2: Partial Redundancy Elimination (Points: 2+3)

1. Give an example where the elimination of partial redundancies generates partially dead code.
2. Prove that given a path $P : a \rightarrow^+ b$, where
 - a) a is down-safe and earliest,
 - b) b has a use of $\tau(a, b)$,
 - c) P contains no use or definition of a or b .

there is no node between a and b that is earliest.

Hint: Show that for all nodes n on P all predecessors of n are down-safe.