Static Program Analysis

http://proglang.informatik.uni-freiburg.de/teaching/programanalysis/2014ss/

Exercise Sheet 6

26.06.2014

Exercise 1

Consider the following program:

Input: z, n. Output: $(z + 1) * n$.

$[result := 0]^1$;
while $[n > 0]^2$ do
    if $[n > 1]^3$ then
        $[x := z + 1]^4$;
        $[result := result + x]^5$;
        $[n := n - 1]^6$;
    else
        $[x := z + 1]^7$;
        $[result := result + (x \ll 1)]^8$;
        $[n := n - 2]^9$;
    fi;
od;

1. Perform an *Available Expressions* analysis for this program (cf. Nielson&Nielson, chap. 2.1.1.), i.e. define the *gen* and *kill* sets and the data flow equations, and find a least solution.

2. In a similar way, perform a *Very Busy Expression* analysis (cf. Nielson&Nielson, chap. 2.1.3.).

3. Transform the program such that it avoids unnecessary re-calculations of expressions.

Submission   In PDF format via email to geffken AT informatik.uni-freiburg.de. Please name your single file with the scheme: ex06-name.pdf.

- Deadline: **03.07.2014, 12:00**

- Late submissions will not be marked.

- Do not forget to write your name on the exercise sheet.