SOFTWARE-MODELLIERUNG UND VERIFIKATION
INFORMATIK 2
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0. Exercise sheet *Static Program Analysis 2011*

Due Mon, 18. April 2011, *before* the exercise course begins. This exercise is not compulsory.

Exercise 0.1:   **(2 + 1 + 1 + 2 points)**

Consider the *WHILE programming language* as introduced in the lecture.

(a) Write a WHILE program calculating the sequence (a_n) given by $a_n = 2^{2^{n-1}}$ for $n = 1, 2, 3, \ldots$. (*Hint:* Note that 2^0 needs special treatment.)

(b) Extend your program of a) to a labelled WHILE-program.

(c) Specify the init- and final-mapping for your program.

(d) Specify the flow-relation of your program and give its corresponding flow graph.

Exercise 0.2:   **(2 + 2 + 2 points)**

Perform an *available expression analysis* for the following nonterminating program:

$z := x + y$;
while true do skip

(a) Provide the control flow graph of the given program.

(b) Give the kill- and generate-functions for the given program.

(c) Specify the corresponding equation system resulting from the *available expression analysis* and determine all its solutions.