
Lecture: Program analysis
Exercise 5

<http://proglang.informatik.uni-freiburg.de/teaching/programanalysis/2010ss/>

1 Monotone Frameworks

1. Show that Constant Propagation (as defined in Sec. 2.3.3 of Nielson&Nielson and on the slides) is a Monotone Framework.
2. Show that the Reaching Definitions Analysis is a Bit Vector Framework.

2 Detection of Signs Analysis

In a Detection of Signs Analysis, one models all negative numbers by the symbol $-$, zero by 0 , and all positive numbers by $+$. E.g., the set $\{-2, -1, 1\}$ is modeled by $\{+, -\}$.

Let S_* be a program, \mathbf{Var}_* the finite set of variables in S_* . Take $L = \mathbf{Var}_* \rightarrow \mathcal{P}(\{-, +, 0\})$ and define an instance of a Monotone Framework for performing Detection of Signs Analysis.

Similarly, take $L' = \mathbf{Var}_* \times \mathcal{P}(\{-, +, 0\})$ and define an instance of a Monotone Framework for performing Detection of Signs Analysis. Is there any difference in the precision between the two approaches?

Submission

- Deadline: 15.06.2010, 11:00, per mail to bieniusa@informatik.uni-freiburg.de, or on paper to Annette Bieniusa, Geb. 079, Room 000-14.
- Late submissions will not be marked.
- Do not forget to put your name on the exercise sheet.