Program Optimization
Exercise Sheet 6
29.11., due 06.12. 15:00

Exercise 1: Worklist iteration

Using worklist iteration, calculate the least solution to the following constraint system. The bottom element is the emptyset.

\[
\begin{align*}
x_1 &\geq (x_2 \cup \{3\}) \setminus \{1, 2\} \\
x_2 &\geq (x_1 \cup x_3 \cup \{4\}) \setminus \{2\} \\
x_3 &\geq (x_4 \cup \{1\}) \setminus \{4\} \\
x_4 &\geq (x_2 \cup \{1, 2\}) \setminus \{1\}
\end{align*}
\]

Solve the same constraint system via RR-iteration. Compare the number of evaluations of the right-hand side for both methods.

Exercise 2: Partial redundancy elimination

Consider the following program:

\[
\begin{align*}
&\text{Neg}(b \neq 0) \\
&\text{Pos}(b \neq 0)
\end{align*}
\]

1. Perform the analyses needed to eliminate partial redundancies, i.e. give the table for available expressions and very busy expressions.

2. Perform the transformation and draw the resulting CFG.