Software Verification
Exercise: Slicing and Abstract Interpretation

1 Program slicing

Consider the following program fragment:

x := 0
y := 0
i := n
j := n
while i > 0 **do**
      x := x + 1
      i := i − 1
      j := i
      while j > 0 **do**
            y := y + 1
            j := j − 1
      end
end
print(x)
print(y)

    (a) Draw the program dependency graph of the program fragment.
    (b) Compute the backward slice of the program fragment for the slicing criteria print(x) and print(y).

2 Abstract interpretation

Consider again the factorial example from the lecture with the sign analysis performed by abstract interpretation.

    (a) Compute the analysis result by chaotic iteration.
    (b) The analysis is rather imprecise. Improve the result of the analysis by:
        1. Changing the program but not the analysis.
        2. Changing the analysis but not the program.