Exercise 8.18: Write and solve the constraints that are generated by the inter-procedural sign analysis for the program from Exercise 8.4, this time with context sensitivity using the functional approach.

解答：

Constraint for entry node v of function inc(a):

$$[\![v]\!](c) = \bigcup_{\substack{w \in pred(v) \\ \wedge c = s_w^{c'} \\ \wedge c' \in \text{Contexts}}} s_w^{c'}$$

其中 $s_w^{c'}$ 表示从上下文 c 中节点 w 的调用创建的抽象状态:

$$s_w^{c'} = \begin{cases} \text{unreachable(if} [\![w]\!](c') = \text{unreachable)} \\ \bot [a \mapsto \text{eval}([\![w]\!](c'),17)](\text{otherwise}) \end{cases}$$

$$s_w^{c'} = \begin{cases} \text{unreachable(if} [\![w]\!](c') = \text{unreachable)} \\ \bot [a \mapsto \text{eval}([\![w]\!](c'),87)](\text{otherwise}) \end{cases}$$

Constraint for after-call node v labeled X = □ ,with call node v' and exit node w∈ pred(v):

$$[\![v]\!](c) = \begin{cases} \text{unreachable(if} [\![v']\!](c) = \text{unreachable} \vee [\![w]\!](s_{v'}^c) = \text{unreachable)} \\ [\![v']\!](c)[X \mapsto [\![w]\!](s_{v'}^c),(18)](\text{otherwise}) \end{cases}$$

$$[\![v]\!](c) = \begin{cases} \text{unreachable(if} [\![v']\!](c) = \text{unreachable} \vee [\![w]\!](s_{v'}^c) = \text{unreachable)} \\ [\![v']\!](c)[X \mapsto [\![w]\!](s_{v'}^c),(88)](\text{otherwise}) \end{cases}$$