Taint Analysis

Let $O = \{A, B, C, ...\}$ and $V_t \subseteq var \times O$

$$\begin{aligned}
\text{GEN}(var := expr) &= \begin{cases} (var, o) & \text{for } \exists\ o \subseteq O : o \text{ in } expr \\ & \text{or } \exists\ o \subseteq V_t(var') : var' \text{ in } expr \end{cases} \\
\text{GEN}(\text{if}(expr)?t : e)) &= \begin{cases} \{(var, o)\} \text{ from } GEN(var := expr) & \text{for } \forall\ var : var \text{ in } t \vee var \text{ in } e, var := ... \end{cases} \\
\text{GEN}(I) &= \{\emptyset\}
\end{aligned}$$

$$\begin{aligned}
\text{KILL}(var := expr) &= \begin{cases} (var, o) & \text{for } \exists\ o' \subseteq O : o' \text{ in } expr \wedge o' \neq o \\ & \text{or } \exists\ o' \subseteq V_t(var') :\ var' \text{ in } expr \wedge o' \neq o \\ & \text{or } \forall\ e \in expr : e \in INTS \end{cases} \\
\text{KILL}(\text{if}(expr)?t : e)) &= \begin{cases} \{(var, o)\} \text{ from } KILL(var := expr) & \text{for } \forall\ var : var \text{ in } t \vee var \text{ in } e, var := ... \end{cases} \\
\text{KILL}(I) &= \{\emptyset\}
\end{aligned}$$

$$\begin{aligned}
\text{JOIN}(S_1, S_2) &= TRANSFER(S_1)\ \cup\ TRANSFER(S_2) \\
\text{TRANSFER}(S, I) &= S - KILL(I)\ \cup\ GEN(I)
\end{aligned}$$