

316 In a language with array element assignment, what is the exact precondition for $A'(i')=1$ to be refined by $(A(A\ i):= 0. A\ i:= 1. i:= 2)$?

After trying the question, scroll down to the solution.

$$\begin{aligned}
& \S \quad \forall A', i'. A' i' = 1 \Leftarrow (A := A \ i \rightarrow 0 \mid A. A := i \rightarrow 1 \mid A. i := 2) \quad \text{expand final assignment} \\
& = \quad \forall A', i'. A' i' = 1 \Leftarrow (A := A \ i \rightarrow 0 \mid A. A := i \rightarrow 1 \mid A. i' = 2 \wedge A' = A) \quad \text{substitute} \\
& = \quad \forall A', i'. A' i' = 1 \Leftarrow i' = 2 \wedge A' = i \rightarrow 1 \mid A \ i \rightarrow 0 \mid A \quad \text{one-point} \\
& = \quad (i \rightarrow 1 \mid A \ i \rightarrow 0 \mid A) \ 2 = 1 \\
& = \quad i = 2 \vee A \ i \neq 2 \wedge A \ 2 = 1
\end{aligned}$$