Assignment 2: Verification

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1   Part A

Given

$$pre \quad \triangleq \quad D.len \geqslant max(\{A.len,\ B.len,\ C.len\})$$

and

$$
\begin{aligned}
post \quad \triangleq \quad & (D = A \cap B \cap C) \\
\wedge \quad & i \in [0, A.len]\ \wedge\ j \in [0, B.len]\ \wedge\ k \in [0, C.len]\ \wedge\ D \in [0, D.len] \\
\wedge \quad & (i = A.len\ \vee\ j = B.len\ \vee\ k = C.len)
\end{aligned}
$$

$$
\begin{aligned}
& i, j, k, r, D : [pre, post] \\
\sqsubseteq \quad & \{\text{Composition: middle predicate is } inv\} \\
& i, j, k, r, D : [pre, inv];\ i, j, k, r, D : [inv, post]
\end{aligned}
$$

$$inv \quad \triangleq \quad (D_{[0,r)} = A_{[0,i)} \cap B_{[0,j)} \cap C_{[0,k)})$$