A NODE in three states

LS labeled & scanned
LU labeled & unscanned
U unlabeled

Two kinds of labels
Temp
Permanent
Step 0

\[ \begin{align*}
& \mathcal{d}_0 \\
& v_0 \\
& \mathcal{L}_S \\
& \mathcal{L}_U \\
& \mathcal{U} \\
\end{align*} \]

Step 1

\[ l_k = \min_i l_i \]

\[ l_k \leftarrow l_k^* \]

Once neighbors of \( v_0 \) have labels

\( v_0 \in \mathcal{L}_S \)
Step 2 updates neighbors of $V_k$

$$l_i \leftarrow \min (l_i, l_k^* + dk_i)$$

$$l_j \leftarrow \min (l_j, l_k^* + dk_j)$$

Once neighbors of $V_k$ have labels
\( V_0 \cap \{ i \} \cup \{ j \} \equiv U \)

\( L S \rightarrow \text{Step 1.} \)

\[ l_p = \min_i |L_U| \]

\[ l_p \leftarrow l_p^* \]

Once neighbors of \( \circ \) have labels, then \( \circ \) moves to \( L S \)
\( V_0 \subset L \cup a, b, s, d, \in U \)

d\( av = l_a = 5 \)

d\( ob = l_b = 4 \) \quad l_d = \infty

d\( wc = l_c = 9 \),
Step 1

\[ \min(5, 4, 9) = 4 \]

\[ l_b \leftarrow l_b^* \]

Step 2. Updates of \( b \)

\[ l_a \leftarrow \min(5, 4+2) = 5 \]

\[ l_c \leftarrow \min(9, 4+3) = 7 \]

\[ l_a \leftarrow l_a^* \]
Step 1
\[
\min(7, 5, 5) = 5
\]
\[
l_a \leftarrow l_{a^*} = 5
\]
Step 2: update neighbors of (a)

\[ l_c = \min(7, s+1) = 6 \]

\[ ld = \min(\infty, s+4) = 9 \]

\[ lc = lc^* = 6 \]

\[ ld = \min(9, lc^* + dca) \]

\[ = \min(9, 6+6) \]

\[ = 9 \]