Aho algorithm

input: A-weighted graph $G = (V, E, \lambda)$ for a complete and idempotent semiring $\underline{A}$

output: matrix $D = (d_{u,v} \mid 1 \leq u, v \leq |V|)$

var: $F_G^{(0)}, \ldots, F_G^{(|V|)} : |V| \times |V|$-matrices over A;

1 **begin**
2 $\quad F_G^{(0)} := M_G \oplus_M 1_M$;
3 $\quad$ **for** $k := 1$ **to** $|V|$ **do**
4 $\quad\quad$ **for** $u, v \in V$ **do**
5 $\quad\quad\quad [F_G^{(k)}]_{u,v} := [F_G^{(k-1)}]_{u,v} \oplus [F_G^{(k-1)}]_{u,k} \odot ([F_G^{(k-1)}]_{k,k})^* \odot [F_G^{(k-1)}]_{k,v}$;
6 $\quad D := F_G^{(|V|)}$
7 **end**

where $M_G = (m_{u,v} \mid 1 \leq u, v \leq |V|)$ with

$$m_{u,v} = \begin{cases} \lambda(u,v) & \text{if } (u,v) \in E \\ 0 & \text{otherwise.} \end{cases}$$