

FLOYD-WARSHALL ALGORITHM

Input: A digraph G with $V(G) = \{1, \dots, n\}$ and conservative weights $c : E(G) \rightarrow \mathbb{R}$.

Output: Matrices $(l_{ij})_{1 \leq i, j \leq n}$ and $(p_{ij})_{1 \leq i, j \leq n}$ where l_{ij} is the length of a shortest path from i to j , and (p_{ij}, j) is the final edge of such a path (if it exists).

- ① Set $l_{ij} := c((i, j))$ for all $(i, j) \in E(G)$.
Set $l_{ij} := \infty$ for all $(i, j) \in (V(G) \times V(G)) \setminus E(G)$ with $i \neq j$.
Set $l_{ii} := 0$ for all i .
Set $p_{ij} := i$ for all $i, j \in V(G)$.
- ② **For** $j := 1$ **to** n **do:**
 For $i := 1$ **to** n **do:** **If** $i \neq j$ **then:**
 For $k := 1$ **to** n **do:** **If** $k \neq j$ **then:**
 If $l_{ik} > l_{ij} + l_{jk}$ **then** set $l_{ik} := l_{ij} + l_{jk}$ and $p_{ik} := p_{jk}$.