

Floyd-Warshall Algorithm

We present the Floyd-Warshall algorithm to solve All Pairs Shortest Path, beginning with the definition of its subproblems.

MAX(P): For $i \neq j$, and given a path P from v_i to v_j , we look at the *internal nodes* of the path (i.e., everything except the endpoints), and let $MAX(P)$ denote the maximum index of any internal node.

If the path is a single edge, then $MAX(P) = 0$.

Thus

- ▶ For $P = v_3, v_1, v_2, v_5, v_7$, $MAX(P) = 5$.
- ▶ For $P = v_5, v_1, v_2, v_7$, $MAX(P) = 2$.
- ▶ For $P = v_1, v_2$, $MAX(P) = 0$ (no internal nodes).