

Shortest Path

- Given a graph $G = (V, E)$ with distances $d(v, w) > 0$ between pairs of vertices, find the shortest (simple) path between two given vertices s and t .
- Length of a path is the sum of the lengths of the edges on the path.
- Simple means no repeated vertices on the path.

Shortest path has optimal substructure: If P is a shortest simple path from s to t going through vertex x , then the part of the path that goes from s to x is a shortest simple path from s to x and the part of the path going from x to t is a shortest simple path from x to t .

Longest Path

- Given a graph $G = (V, E)$ with distances $d(v, w) > 0$ between pairs of vertices, find the **longest** (simple) path between two given vertices s and t .
- Length of a path is the sum of the lengths of the edges on the path.
- Simple means no repeated vertices on the path.

Longest path has optimal substructure:?? If P is a **longest** simple path from s to t going through vertex x , then the part of the path that goes from s to x is a **longest** simple path from s to x and the part of the path going from x to t is a **longest** simple path from x to t .