Module 3: Graph Analysis

From one Node to A-Node-r

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Connectedness

- Some nodes in a graph may not be reachable from each other.
- **Dangling nodes**: Nodes without any edges.
- **Connected nodes**: Nodes that can be reached from each other.
- The path from one node to another is called a **walk**.

Geodesic Distance

- Measures how connected two nodes are or how far apart they are in a graph.
- Calculated by counting the edges in the shortest path between two nodes.
- Denoted as $d(v_i, v_j)$ for nodes v_i and v_j.
- $d(v_i, v_j) = \infty$ if the nodes are not connected.
- Statistics based on distance may be meaningless if nodes are not connected.

Neighbors and Second Neighbors

- v_j is in the **neighborhood** of v_i when $d(v_i, v_j) = 1$.
- Nodes with $d(v_i, v_j) = 2$ are **second neighbors**.
- Neighboring nodes are "next to each other" in terms of connection.