

This miniproject asks you to investigate connectedness in directed graphs.

Find an example of a directed graph whose underlying undirected graph is K_4 such that each of the properties hold, if possible. Note: K_4 has no multiple edges or loops, and each pair of vertices is connected to each other directly.

- (a) The graph is strongly connected.
- (b) The graph is strongly connected but is fundamentally different from the graph you gave in part (a).
- (c) The graph is weakly connected but has a 3-vertex component that is strongly connected.
- (d) The graph is weakly connected by has two 2-vertex components that are strongly connected.
- (e) The graph is weakly connected and there are no strongly connected components.