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Intrinsic Linking and Knotting in Directed Graphs.

We extend the notion of intrinsic linking and knotting to directed graphs. We give methods of constructing intrinsically linked directed graphs, as well as directed graphs with arbitrarily large numbers of edges that are not intrinsically linked. We give a simple construction that takes a graph G and doubles it to get a directed graph Γ with twice as many edges as G , proving that it gives an intrinsically linked directed graph if and only if G is intrinsically linked. One corollary is that J_6 , the complete directed graph on six vertices (with 30 directed edges), is intrinsically linked. (Received September 01, 2014)